

17 November 2022
Baby E

CONTENTS

Housekeeping

DR DAVID HARKNESS (recalled)
Examination-in-chief by MR ASTBURY
Cross-examination by MR MYERS
Re-examination by MR ASTBURY

Thursday, 17 November 2022
(10.30 am)

(Delay in proceedings)

(11.17 am)

(In the absence of the jury)

Housekeeping

MR JUSTICE GOSS: Yes, Mr Astbury.

MR ASTBURY: My Lord, thank you for the time this morning.

Apologies that the situation arose.

Before calling Dr Harkness there's one matter of housekeeping that I need to deal with arising out of the NNU review and the apparent error yesterday.

MR JUSTICE GOSS: Yes.

MR ASTBURY: The error in fact was mine, the review is right. It was the wrong feeding chart.

MR JUSTICE GOSS: So we can retain the --

MR ASTBURY: Yes, no need for a change, but I think I need to correct the impression that was created that it might be inaccurate.

MR JUSTICE GOSS: I think you should correct that.

MR ASTBURY: Yes. We expect Ms Williamson to be back next week in the case of [Baby F], so if it's felt necessary we can confirm the signature is hers on that occasion, although I'm not sure, given the evidence, a great deal turned on it in the end, but we can complete it.

MR JUSTICE GOSS: But on the face of it, it looked as though that was wrong?

MR ASTBURY: Exactly.

MR JUSTICE GOSS: The jury should be told that, otherwise it's a wrong impression that might linger.

MR ASTBURY: Yes.

MR JUSTICE GOSS: Thank you.

(In the presence of the jury)

MR JUSTICE GOSS: Good morning, members of the jury. I'm sorry we're late starting. It was nobody's fault as such, it was travel difficulties this morning. We are at that time of the year when you do get unexpected crashes all over the place, road traffic accidents blocking roads, and you know what the consequences are.

Our roads are chock-a-block now with vehicles. It doesn't take much for the whole system to be put in difficulty.

Thank you very much.

MR ASTBURY: The next witness will be Dr Harkness, from whom the jury have heard before. But before calling Dr Harkness, can I correct an error from yesterday, an error entirely on my part?

The jury will recall, I took the witness, Ms Williamson, to the NNU review and, in particular, if I can ask everyone to turn to it again, that large folder, please, the NNU review of [Baby E]. It might be easier to work back from the end because it's the last of the reviews in the file. It's page 3 of 11 in that particular review.

I'm sure everyone will remember, but I took the witness to line 59, which is near the bottom, and suggested that she'd fed a baby by the name of JE at 10 o'clock, as represented, and then took her to the source material, and she quite properly pointed out that it was not her signature next to the feed.

So if we can go to that document, please, Mr Murphy and put it on the screen. About halfway down, it's the last entry timed at 10 o'clock in the rows that form the document. That was what I showed, you'll recall, Ms Williamson today. But if we look in the top left box, we'll see the date 4 August, and of course I should have been asking her about 3 August.

So if we scroll down, please, or move to the preceding form, which is dated the 3rd, and if we look at the entry again timed at 10 o'clock in the middle of the page, that's what I should have been showing her.

So that's where the confusion arose. We don't need to scribble anything out on the NNU review: it's right, it was me that fell into error, so I apologise for that.

MR JUSTICE GOSS: Did everybody follow that? She was shown the wrong day. The right day shows it, BS; she was then Belinda Simcock, now Belinda Williamson. Anyway, she is going to come back and, we anticipate, confirm that that's the situation.

MR ASTBURY: Yes.

MR JUSTICE GOSS: It was thought best to correct that now because it was left hanging in the air somewhat yesterday, as you'll remember, and was a source of some puzzlement.

MR ASTBURY: Thank you, my Lord.

Having corrected that, can I call, please, Dr David Harkness?

DR DAVID HARKNESS (recalled)

Examination-in-chief by MR ASTBURY

MR ASTBURY: Dr Harkness, you've given evidence in these proceedings before. I'm afraid I can't remember whether you took the affirmation or the oath.

MR JUSTICE GOSS: Anyway, you are subject to --

MR ASTBURY: You are still bound to that undertaking that you took.

You were, we know, employed at the Countess of Chester Hospital as a paediatric registrar in the summer of 2015. And you've come along today to answer questions about a shift, the night of the shift that you completed, between the 3rd and 4 August of 2015 --

HARKNESS: That's correct.

ASTBURY: -- and in particular, a baby by the name of [Baby E] and your dealings with [Baby E].

HARKNESS: Yes.

ASTBURY: What time would your night shift have started on that occasion?

HARKNESS: I think we started at 8.30, if I remember rightly, with a half-hour handover period. It might have been 9 o'clock, I can't remember. With working in so many hospitals, it's different in every place.

ASTBURY: So either 8.30 or 9, the shift would have started?

HARKNESS: Yes.

ASTBURY: Would have then been followed by a handover?

HARKNESS: Yes.

ASTBURY: We've heard something about nursing handovers and effectively the shift finishing and the shift starting, exchanging information about the babies in their care.

Same sort of thing with the doctors?

HARKNESS: Yes.

ASTBURY: And just very quickly, how would that take place?

HARKNESS: So we would sit in a room together, the day team and the night team, we would have handover sheet, which would have all of the details of the patients summarised, what their diagnosis was, how old they were, if they had any outstanding issues. And we would -- the day team would go through each individual patient and tell us what had happened with them through the day.

ASTBURY: Would that be for an individual unit?

HARKNESS: There would be one handover for the children's ward, one handover for the neonatal unit, but the same doctors would be in both.

ASTBURY: Okay. So you'd be assuming responsibility for both units on nights?

HARKNESS: Yes.

ASTBURY: And anywhere else, should you be needed?

HARKNESS: A&E. If there were any sick children, then we would attend A&E as well.

ASTBURY: How long typically would that handover take?

HARKNESS: Typically, you expect it to be 30 minutes. It can be longer, but typically a 30-minute handover.

ASTBURY: So that would have finished either at 9 or 9.30 depending on when the shift began or thereabouts?

HARKNESS: Yes.

ASTBURY: Where would that handover have taken place?

HARKNESS: That happens on the children's ward.

ASTBURY: Okay. Do you recall who you were working with that night on the shift?

HARKNESS: From my personal recollection, no. From looking through the case notes, there was a Dr Chris Wood who was my SHO.

ASTBURY: Would he too be required to cover both the children's and the neonatal unit on that night shift?

HARKNESS: Yes.

ASTBURY: Did you work together or would you work separately?

HARKNESS: Depends on what we were doing. Some tasks would require both of us together, other tasks we would work independently. So it very much depended on the complexity.

ASTBURY: The handover having finished, do you recall specifically what you'd have done next on that particular shift?

HARKNESS: So not that particular shift. Typically it would be that we would look for -- if there were a sick patient, to go and review a sick patient, otherwise talk to the nurses on children's ward for any of their concerns and then go over to the neonatal unit to see if there were any concerns there. But I can't remember any specifics from that shift.

ASTBURY: Okay. So on that typical course of events what sort of time would you expect to be going to the neonatal unit on a regular night shift?

HARKNESS: Very much depending on what was happening elsewhere.

Typically, if there was nothing on the children's ward, I'd expect to be there by 10/10.30.

ASTBURY: Okay. Do you recall on that particular shift what time you went over to the neonatal unit?

HARKNESS: From my statement and the notes, it was approximately 10 o'clock, 10 pm.

ASTBURY: That's based on the notes that you've seen?

HARKNESS: Yes.

ASTBURY: And did the notes explain to you why you attended, if there was any reason in particular?

HARKNESS: I was called to see [Baby E], who had had some blood in some vomit and blood up his NG tube, the tube that goes into his stomach.

ASTBURY: Do you recall whether you were shown anything when you arrived?

HARKNESS: I was shown a sample of this, what we call a bloody aspirate or a dirty aspirate, which was essentially stomach contents that was pulled back up through the tube, that had some small amounts of blood in it.

ASTBURY: Could you expand a little bit on small amounts of blood?

HARKNESS: I think what I've put is flecks and what I remember is flecks, so it'd be tiny, minuscule amounts of blood, so no large clots, no fresh blood, it would be tiny spots of blood throughout.

ASTBURY: Perhaps we should go to your note for the detail of what then happened. If I can ask Mr Murphy to take us to tile 128 and the notes behind, please. If we scroll down.

Your name at the top, you recognise the handwriting?

HARKNESS: Yes.

ASTBURY: Your handwriting?

HARKNESS: Yes.

ASTBURY: Cast your eye over the note. That's only half of the note, I think it follows on to the next page, but if it just helps you refresh your memory for a moment. Then I'll ask you to take us through it.

HARKNESS: I have put:

"Asked to see re gastric bleed. Large, very slightly bile-strained aspirate 30 minutes ago."

ASTBURY: Pausing there. The time on the left-hand side of the page, what does that represent, the time you arrived, the time you made the note? Are you able to --

HARKNESS: That would be the time that I've written the note.

ASTBURY: Right. When you talk about "30 minutes ago", are you able to tell us roughly what time now that would have been?

HARKNESS: Based on that, that would be between 9.30 and 9.45 would have been what I'd expect from that -- where I would have been, sorry? If I'd not been at that point on the unit, then I would have been on the children's ward.

ASTBURY: And the reference to 30 minutes, was that what you knew to be the case or what you were being told by --

HARKNESS: What I'd been told.

ASTBURY: -- whoever was passing the information on? When you arrived at the NNU, did you go straight to [Baby E] as a result of the request?

HARKNESS: Yes.

ASTBURY: And who was there when you arrived?

HARKNESS: Nurse Letby was there. I can't remember who else was in the room at the time.

ASTBURY: Sorry, the next line, please.

HARKNESS: "Sudden large vomit of fresh blood and 14ml aspirate."

ASTBURY: Pausing there, is that something you were told or something that you saw?

HARKNESS: This is something that I've seen.

ASTBURY: Just tell us then, please, you've arrived to meet Ms Letby and [Baby E] in -- do you remember which nursery they were in?

HARKNESS: Nursery 1.

ASTBURY: You're told that there's been a large, very slightly bile-stained aspirate 30 minutes ago, and you are shown an aspirate?

HARKNESS: Yes. So what I'm shown at this point has got the small amounts of fresh blood and a total of 14ml, which would have been sucked up through the NG tube into a syringe.

So 14ml and there was blood in that.

ASTBURY: Are you able to help with what the 14ml comprised?

HARKNESS: That was mostly stomach contents, so I can't remember exactly, but it would have been a combination of stomach acid and milk.

ASTBURY: How did this note then -- or what developed to give cause to this note:

"Sudden large vomit of fresh blood"?

HARKNESS: Could you rephrase that, sorry?

ASTBURY: What gave rise to this entry?

HARKNESS: This would be when I was called to review, so I would have reviewed at this time, being called to look at this vomit, and then made this recording of my decision at the time.

ASTBURY: So, "Sudden large vomit of fresh blood" -- sorry, my understanding was that you were there when this happened.

HARKNESS: So I was called for the large vomit which had a small amount of blood in it. The fresh blood came later.

ASTBURY: Right. So when did that come?

HARKNESS: I can't remember the exact times. It should be documented in my notes, I think. I can't remember what I've put in my statement for the exact timing but that was within the next following hour to 2 hours.

ASTBURY: Just concentrating on this note for now, this second line, "Sudden large vomit of fresh blood", when did that happen?

HARKNESS: So I think... I don't think I was referring there for the large amounts of fresh blood. I think I'm commenting on large vomit with blood and 14ml of aspirate. So I don't think expressly that's me saying that there is large amounts of blood for this initial review, I would need to see the rest of my note.

ASTBURY: All right. If we scan to the next page, please, just so you can finish reading it in full.

HARKNESS: So this was the small amount of blood in this one, looking at what I've written there. So I've reviewed the observations on the previous page, I have examined [Baby E], and I've put -- the triangle there is my suspicion of diagnosis of GI bleeds, query cause.

ASTBURY: I'm going to ask you to pause because I want to go through the note in order.

HARKNESS: Certainly.

ASTBURY: Perhaps if you look at the next entry at 11 o'clock, just to orientate yourself as to the events that follow, and we'll go back to the start of the 10.10 notes.

(Pause)

HARKNESS: Okay.

ASTBURY: There is a note later (inaudible: coughing) if that helps you distinguish the first sequence of events. So you're called and at 10.10, you record that you were told there was a "large, very slightly bile-stained aspirate", 30 minutes before, presumably, your arrival.

HARKNESS: That's correct.

ASTBURY: So the "sudden large vomit of fresh blood", when was that on this occasion --

HARKNESS: That was on this occasion when I was called.

ASTBURY: And were you there when this took place?

HARKNESS: I don't think I was there when this took place. From looking at the whole set of notes, I think I was called to see this one. For the subsequent ones I was on the unit.

ASTBURY: All right. It says:

"Sudden large vomit of fresh blood..."

Is that an and?

HARKNESS: Yes.

ASTBURY: "... 14ml of aspirate."

HARKNESS: Yes.

ASTBURY: So was this another aspirate or the one that you are referring to in the line above?

HARKNESS: This was the same -- this was part of this, this was the... Not the bile-stained one from 30 minutes ago, this was the 14ml plus a vomit that happened that I was called to see.

ASTBURY: Right, okay.

MR JUSTICE GOSS: I'm sorry, I'm probably being very stupid, but I'm not understanding this. Let's just take this in stages:

"Asked to see patient re gastric bleed."

So that implies that you've been called to a patient who has had a gastric bleed.

HARKNESS: So this was the bloodstained vomit that I was called to see. So chronologically, 30 minutes before my arrival, there was a large bile-stained vomit that I haven't seen. And then at 10.10, I've been called to see the sudden large vomit of fresh blood and 14ml of aspirate, which has happened at around about the 10 pm mark, where I've been asked to go and see. So these are separate vomits 30 minutes apart.

MR JUSTICE GOSS: But two vomits before you get into the unit?

HARKNESS: Yes.

MR JUSTICE GOSS: Right.

MR MYERS: I'll return to it in questioning later. I have to say, my Lord, that is not the way I had understood it. It sounded as if there had been a visit to the unit, then gone away, and then come back for the second one but I can explore that later.

HARKNESS: I need to see the rest of the notes to see the exact timings.

MR JUSTICE GOSS: Have you seen the notes this morning?

HARKNESS: I've seen my statement this morning.

MR JUSTICE GOSS: But you haven't seen these notes?

HARKNESS: I've not seen the notes, no.

MR JUSTICE GOSS: Right.

HARKNESS: We'll see whether the nursing notes fit with my exact timings.

MR JUSTICE GOSS: I think you'd better go back over this and try and make it clear because at the moment, to me, it's unclear.

MR ASTBURY: Is this a process to complete now with Dr Harkness?

MR JUSTICE GOSS: Well, I think so. I think go through the notes and then invite the doctor to talk to the notes, speak to the notes.

MR ASTBURY: All right.

If we go then, please, down to the next page, Mr Murphy.

Take a moment, please, Dr Harkness, to look -- finish the 22.10 note and then also go on to read, please, the 23.00 note.

HARKNESS: I've put on examination --

ASTBURY: Sorry, could you --

MR JUSTICE GOSS: Read it to yourself first of all.

MR ASTBURY: Refresh your memory and get the chronology in your head and we'll go back to the start.

HARKNESS: So to look at the exact timings of the first one, I would need to see the nursing notes.

ASTBURY: We can do that as well. If we have a look at your notes first --

HARKNESS: Certainly from this point of view...

ASTBURY: -- then we'll go to the nursing notes --

MR JUSTICE GOSS: Yes, all right.

MR ASTBURY: If we can scroll up, you can have a look at your 23.00 hours note, please.

(Pause).

HARKNESS: Okay.

ASTBURY: If I can ask Mr Murphy please, next, to go to tile 149.

(Pause)

HARKNESS: Okay.

(Pause)

ASTBURY: Then if we go, I think, to tile 127. Go to the nursing notes behind, please.

(Pause)

We can make it a little larger for you, it'll be easier to read.

HARKNESS: I think it'll be the previous one.

ASTBURY: If we go to the previous tile, please. Sorry, Mr Murphy.

The bottom right, thank you.

(Pause)

HARKNESS: Okay, that makes it clearer.

ASTBURY: Again, just so we perhaps don't need to come back to this, if you look at the next note as well, please, if we go back to 127.

(Pause)

HARKNESS: Okay.

ASTBURY: Right. If we come out of the nursing notes, please, and just for the sake of completeness, I'm going to ask Mr Murphy next to go to tile 160 and look at the notes behind.

Not your handwriting, Dr Harkness, but I don't think there's any dispute you were present at 01.30; is that right?

HARKNESS: Yes.

ASTBURY: If you just want to refresh your memory too from those events.

(Pause)

HARKNESS: Yes.

ASTBURY: So if we go back to 128, please, and the notes behind.

Hopefully that's refreshed your memory of the whole of the relevant sequence on that shift.

HARKNESS: Yes.

ASTBURY: Apologies for that. If we look now at "Sudden large vomit of fresh blood and 14ml aspirate", does that fit that entry into the chronology as you now recall?

HARKNESS: Yes, that would have been some fresh blood and 14ml taken from the tube. It's not clear from what I've written how much of that 14ml was fresh blood versus mixed with stomach contents, and I don't know how much of that was fresh -- was all fresh blood. However, that was the first instance of blood, fresh blood, seen. So the flecks were something -- I think what I've put there is bile-stained, I think... I've seen the bile-stained aspirate when I've come, and then I've seen the fresh blood on my arrival.

ASTBURY: Okay.

HARKNESS: Sorry for the confusion.

ASTBURY: No, no.

MR JUSTICE GOSS: Well, can we just then be clear? What you've written down here, how much of that was what you were told or how much of that was you actually witnessed?

HARKNESS: The blood is what I've witnessed. This is what I've seen. The bile-stained is something that I've been told, possibly seen. The blood I have definitely seen, that's something that I've been called over to see and I have seen for myself definitely.

MR JUSTICE GOSS: Have you seen it actually occurring or have you just seen the product?

HARKNESS: I have been called for the product --

MR JUSTICE GOSS: To see the product?

HARKNESS: This was the product, sorry.

MR JUSTICE GOSS: Sorry, as I said, it was me being stupid.

I think that makes it clearer.

HARKNESS: It's so long ago, it's difficult.

MR JUSTICE GOSS: Of course it is and you're reliant on your notes largely.

MR ASTBURY: I think, I'll be corrected if I'm wrong, you were told about the bile flecks, you arrived, you think it was that second entry that caused you to be called?

HARKNESS: Yes.

ASTBURY: And you were shown that product?

HARKNESS: Yes.

ASTBURY: All right. The next line, "Background". Could you read your entries there?

HARKNESS: "Reduced end-diastolic flow."

That's the flow of blood from the placenta into baby. When they do an ultrasound in the womb they will look to see the blood flow and there will be less blood flow than you would like to see. What this means in respect of this is that it can increase the risk of a lack of blood to the bowel and problems with the bowel. I've put IUGR, which is intrauterine growth restriction. So that's a small baby, smaller than you'd expect the baby to be at that point in time.

I have put:

"Re-screened for increased oxygen requirement yesterday and a CRP of less than 1."

So his oxygen had gone up for the previous day, or the previous team, due to his oxygen going up, and so he was restarted on antibiotics. Bloods sent to look for bacteria in the blood and the CRP being a sign of infection, which was less than 1, which doesn't suggest there being any infection at that point in time.

ASTBURY: Pausing there, you say his oxygen went up; is that his oxygen requirement?

HARKNESS: Oxygen requirement, yes.

ASTBURY: Okay.

HARKNESS: And then I've put "opening bowels". So that was important in that if babies have problems with their bowels, their bowels tend to go to sleep and they tend to stop passing poo.

ASTBURY: So that's why you have recorded that?

HARKNESS: That's why I've recorded that, yes.

ASTBURY: There are some figures recorded thereafter. Could you take us through those?

HARKNESS: I have put:

"Mean blood pressure of 48."

Ideally at his age you'd want that above 30, so you've got your top blood pressure, your bottom blood pressure, and we are more interested in something that comes in between. So 48 was very good at that point in time and nothing of concern.

CRT, which is cap refill time, of less than 2, which is ideal, that's where we want it.

Heart rate I've put of 140 to 100. I don't know why I put it that way round. But essentially, that's the normal rate. 100 to 140, I'd be very happy with that for a baby.

Saturations of 100% in 23% oxygen, FiO2. So again his oxygen level now is very minimal, he's breathing well for himself, the saturations can only go as high as 100, we tend to want them in the 90s. So at that point in time everything is fine other than the blood that I have seen.

ASTBURY: Right. If we scroll down to the next page, please.

"OE"?

HARKNESS: OE is on examination. So I put that he's alert, pink, well perfused, so nice and pink throughout his limbs.

Cap refill time less than 2. Heart rate was normal.

The diagram is a picture of his lungs. A cross through the lungs essentially means that the lung fields are clear, so I can't hear any suggestion of reduced air entry onto the lungs or any crackles or signs of infection.

I have put:

"Abdo soft, not distended. BS [bowel] sounds +."

So at this point his bowels are still moving away, I can hear that they have not gone to sleep, they're still working.

His tummy is nice and soft and not distended. If a child has problems with their bowels or their stomach you tend to find the stomach expands, the abdomen tends to expand with it as well. In this case that was all normal.

I have put "AF normotensive". The AF is the anterior fontanelle, the soft spot on the front of the head. Normotensive just means it's normal.

"Femorals ++", so we feel the pulses in the groin.

And plus plus means they're both present and they're both strong enough for me to feel them, which is good.

I have put the diagnosis:

"GI bleed, [query] cause."

ASTBURY: Let's pause. Just take a break and ease down a little bit and slow it down, I hope. The little triangle that you have drawn, is that code for something?

HARKNESS: That is a delta sign, we tend to put that for diagnosis.

ASTBURY: You put GI bleed? Just explain that to us, please.

HARKNESS: That's gastrointestinal bleed, so blood has come from somewhere between the oesophagus and the anus, that's the GI tract.

ASTBURY: And that's based on what you have seen?

HARKNESS: That's based on me seeing blood that's come into the tube and has been vomited.

ASTBURY: And you're querying the cause. Presumably that's what then informs your plan that follows?

HARKNESS: Yes.

ASTBURY: Take us through the plan.

HARKNESS: I have put:

"IV [so intravenous] ranitidine."

Ranitidine is a medication that reduces the acid produced by the stomach, so if you've got increased acid or irritation to the stomach, it can help to reduce that. So we'll tend to give that if there's any suspicion of any blood.

I have put, "Add metronidazole". Metronidazole is a different type of antibiotic we use to cover for necrotising enterocolitis, so I've put in brackets:

"At risk of NEC."

ASTBURY: Pausing there. You mentioned earlier that that's something that arises out of absent end-diastolic flow; is that right?

HARKNESS: It's something that comes with prematurity. A risk factor for that will be being small and having that reduction of the blood flow through the placenta.

ASTBURY: So that was a possibility that was in your mind?

HARKNESS: It was on my mind. It wasn't fitting with it at this point in time. There was nothing else to suggest it.

However, because of the vomit, and because of that background, that was where my decision came to add the antibiotic.

ASTBURY: The next entry, please?

HARKNESS: That's "close observation" because, obviously, I'm concerned at this point and I want to make sure he continues to be closely supervised. He was in room 1, so he would have been at the highest level of care anyway. It's just to reiterate the point.

ASTBURY: Just pausing there, who would be responsible for close observation?

HARKNESS: That would have been the nurse looking after him, who was Nurse Letby.

ASTBURY: Okay. Next one, please?

HARKNESS: I have put:

"Repeat FBC [for full blood count] mane [morning]."

Essentially, if you have had any blood loss, if you do a blood test straight away, you don't tend to notice any difference because your body is yet to compensate.

When you check it the following morning, if there is a significant amount of blood that's been lost, you'll notice that that result drops. And then you could make further treatment, such as giving blood, based on that.

ASTBURY: Right. And the last line, please?

HARKNESS: I put:

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

So that was a telephone conversation.

ASTBURY: And we've heard that [Dr C] was the consultant on call --

HARKNESS: Yes.

ASTBURY: -- at that stage?

HARKNESS: Yes.

ASTBURY: So at 11 o'clock, we have your next entry. Can you recall what you did after your examination of [Baby E]?

HARKNESS: Following my previous -- I can't tell from that point of view whether I left the unit or whether I stayed on the unit based on that entry. I think from my recollection, I certainly didn't go very far away because this was something that was unusual -- and the time frame would suggest that I wasn't very far away either. But I don't think I left the unit.

ASTBURY: As a matter of interest, you told us you started on the children's ward --

HARKNESS: Yes.

ASTBURY: -- and then you made your way to the neonatal ward.

HARKNESS: Yes.

ASTBURY: How far is that, how long would that take ordinarily?

HARKNESS: A couple of minutes.

ASTBURY: Having refreshed your memory from your notes and the entirety of the shift, tell us, please, what you recall from 11 o'clock.

HARKNESS: So from 11 o'clock, from what I remember happening -- was suddenly a large amount of fresh blood being seen in the tube.

ASTBURY: Pausing there, by you or you were alerted to that by others?

HARKNESS: I can't remember whether I was -- from what I remember I was on the unit and I was called to come into the room to see it, so I had seen it as it happened.

ASTBURY: Do you remember who called you into the room?

HARKNESS: Nurse Letby.

Then, from what I remember, from that point of view, he'd suddenly then deteriorated following that and needed ventilating, which then continued to deteriorate, needed bloods -- needed medications to give his blood pressure up, needed fluids to try and help expand the amount of blood going around the body, and then sadly continued to deteriorate and passed away.

ASTBURY: Let's go through it step-by-step, if we may, please.

That's probably a summary of --

HARKNESS: Yes.

ASTBURY: -- what remained of the shift. Can we start with 11 o'clock?

HARKNESS: 11 o'clock.

ASTBURY: You've got the blood loss and a desaturation -- is that to 70%?

HARKNESS: So 70% -- so further blood coming through the tube and I remember seeing this in the tube at this time, seeing at this point fresh red blood in the tube.

ASTBURY: If we go to the next line:

"13ml bloodstained fluid."

Is that what you're talking about?

HARKNESS: Yes. So this was fresh blood in with a bit of stomach content and then -- that's from the NG on free drainage.

The NGT is the tube going into the nose. Free drainage is essentially -- normally you put a little bung on the end of the tube to stop anything from coming up. If you're worried that a baby is vomiting, the last thing we want is that vomit to get on to the lungs, so by putting a syringe on to the end of it what happens is that anything will come up with that tube with the pressure and go into this little syringe instead. So free drainage is what that means. So everything should come up into that tube, so the whole stomach contents should come up.

ASTBURY: Is that how you're able to tell us the volume of what --

HARKNESS: Yes. So this is within the tube -- if it was vomit you obviously can't tell because it's everywhere, but this was bloody fluid that was in the actual tube, it came up the tube into this syringe at the end, so we can measure that.

ASTBURY: The fact that it's coming up the tube, does that assist with perhaps where its origin is?

HARKNESS: Yes. So because it's come up that tube, it has to have come from somewhere along the gastrointestinal tract.

So it could have been the oesophagus that's been swallowed into the stomach and come up through the stomach, it could have been within the stomach itself.

What this rules out this being is any blood that's come from the lungs because any blood that had coughed up from the lungs wouldn't have come into the tube, it would have come out through the mouth and through the nose.

ASTBURY: Right. We've got some more entries on the next page.

HARKNESS: I have put:

"BP [so blood pressure] stable."

His mean blood pressure was still good at 43. His heart rate at this point had gone up slightly from 140 to 160, previously it was 100 to 140, still not high enough for me to be overly concerned. His saturations, so the amount of oxygen in the blood, has dropped down to 60 to 70%, so very low. And he's now requiring 100% oxygen to keep them where they are. But I have put he's making good respiratory effort, so he's still breathing for himself, and crying.

ASTBURY: Can we pause there and just consider that entry, please.

HARKNESS: Certainly.

ASTBURY: So at some point, you told us earlier he was in oxygen at about 23%?

HARKNESS: Yes.

ASTBURY: At some point because of his condition that's had to be increased?

HARKNESS: Yes.

ASTBURY: To 100%?

HARKNESS: Yes.

ASTBURY: And despite that, his saturations are dropping as low as 60 to 70%?

HARKNESS: Yes.

ASTBURY: How does that fit in with the fact that he's making a good respiratory effort?

HARKNESS: So he's still trying to breathe at this point in time.

So what can happen is a baby can either stop breathing and they will drop or they'll not be breathing fast enough to get the oxygen in or, in his case, he was still breathing, taking big breaths to try and get the oxygen in the blood, but something at this point in time is interfering with how that oxygen is getting into his bloodstream.

ASTBURY: Right. And you comment on him crying. Is that of relevance?

HARKNESS: So at this point he's well enough at this point in time, he's still able to cry, he's still awake, he's still crying, he's not unconscious. I have not commented on what kind of cry this is, but from looking at the rest of my documentation at this point in time it suggests he's still well enough to be able to cry, as a baby would. If I put just as crying it would be a typical cry that I would expect from -- any baby to make.

ASTBURY: Does the ability to cry tell you anything about the oxygen or the air going in and out of the chest?

HARKNESS: Yes.

You have to be able to take -- as anyone with a baby knows, babies have to be able to take a big breath in to be able to make the noise when they cry. You need to push that air out, same with talking. You have to be able to get air into your lungs to get it out. You have to be awake enough to be able to coordinate crying and your brain to tell you to want to cry. So at this point he is still awake and he is still taking big breaths to be able to cry.

ASTBURY: Right. So based on the situation at 11 o'clock and that second loss of blood, you draft a plan again. Could you take us through that, please?

HARKNESS: I have put:

"Replace losses with 20ml per kg of 0.9% saline."

So essentially what we'll do at this point in time is because we're measuring how much is coming out, we can then replace that with giving fluid back in again. So what I have done is given him salt water -- the first thing you would do is give some salt water rather than blood because it's much quicker to get into the system and order because we have it there.

I have put "strict fluid balance". I want to make sure I know exactly how much is coming out so I know exactly how much to put back in and also as part of that how much he's weeing, which can be a sign of how sick he is.

I have put:

"For elective intubation with drugs."

So that's me putting the tube into his lungs to breathe for him. Although he's breathing for himself, because he needs so much oxygen, I want to make sure I can help him as much as possible and give him rest.

So I am going to intubate him at this point in time, I have also planned to do a chest X-ray -- CXR is chest X-ray, AXR is abdominal X-ray -- to look to see if there's anything that changed on his lungs, to look to see why his oxygen's gone up and also to see if anything's happening within his abdomen that would suggest why he is deteriorating well and why he is bleeding.

ASTBURY: Just going back to the entry concerning intubation, it's described as an elective intubation.

HARKNESS: So at this point he's well enough -- elective would mean I've got enough time to plan it and give medication.

You have elective and emergency. At this point he's well enough for me to give him medications to sedate him and give him some muscle relaxants to make it much easier to intubate him and make it much more pleasant for the baby when they're going through the experience as well. So it's a much more controlled environment to do this at this point in time.

ASTBURY: Right. There is presumably another type of intubation?

HARKNESS: The opposite would be an emergency intubation where you have no time to give medications and you just have to go as fast as you can, essentially, to get the tube into the lungs.

ASTBURY: We may come back to that in a moment. But at this stage elective intubation --

HARKNESS: Yes.

ASTBURY: -- time to do it, with drugs.

HARKNESS: Yes.

ASTBURY: -- and not what you describe as an emergency intubation?

HARKNESS: No.

ASTBURY: Okay. I think we've got "discussed with surgeons", is that, the next line?

HARKNESS: Yes. That's "Discuss with surgeons with X-ray results".

So once I would have the X-ray, if there was anything suspicious to go with the cause of the bleeding, I would then call the surgical team in Alder Hey to discuss with them what I found and any suggestions they would have and then I've put:

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

ASTBURY: As far as getting the X-rays and discussing them with the surgeons, what sort of timescale would you expect for that?

HARKNESS: X-rays at night, you tend to be looking at, at best, 15 minutes, typically 30 minutes. They have one radiologist covering the entire hospital, so the timing very much depends on if there's other sick patients within the hospital, if there's someone in A&E that's very sick that needs an X-ray. Because the X-ray needs to come to the neonatal unit as opposed to the baby going to them, it's a much more time-consuming process, but I would expect 15 to 30 minutes as an average.

ASTBURY: Again, you just made the point, you discussed it with [Dr C] and she has nothing to add to that plan?

HARKNESS: Yes.

ASTBURY: Okay. So do you recall what you did next after that particular set of observations and conversation with [Dr C]?

HARKNESS: At that point I have made the plan to intubate, I would have prescribed the medications and I would have been getting ready to intubate, so I would have been getting -- the

nurses would be getting the drugs ready, I would be preparing my equipment to plan to intubate the baby.

ASTBURY: With that in mind and pausing there, let me get the right reference, please, given its importance.

(Pause)

J2645, please. It may be that we can enlarge those a little bit.

We can see a prescription, do you agree, for the pharmacy?

HARKNESS: Yes.

ASTBURY: We can see the name of the drugs, atropine sulphate, injection, the size of the dose, and the timing of that particular prescription at 23.28.

If we scroll down to the activity, it was a little bit higher than I was going to draw that attention to, but while we're on that we can see it wasn't actually given because on the right we've got "Filed at 04.58"; do you agree?

HARKNESS: Yes.

ASTBURY: If we can go to the top half again, please, just to confirm the doctor who wrote the prescription. We have "New order by ST.WOCH". Knowing how these codes tend to be made, are you able to help us with which doctor wrote the prescription?

HARKNESS: I would make the assumption that that's Chris Wood based on the letters involved. Yes, it's normally surname followed by first name, first and last digits -- first digits.

ASTBURY: If we go back to the whole (inaudible: coughing) and just scroll through it, Mr Murphy.

That's the atropine sulphate. If we go to the next, please, the next prescription. 2647 for the next one.

MR JUSTICE GOSS: Sorry, can you say that again?

MR ASTBURY: 2647 for the next prescription.

That's for morphine sulphate?

HARKNESS: Mm-hm.

ASTBURY: Another preparatory drug for intubation?

HARKNESS: Yes.

ASTBURY: Thank you. If we go to the next prescription, please, which is 2647. I think the number's now obscured by an enlargement. Not a complaint. 2649, thank you.

Possibly the page before. There's three prescriptions in the file.

That's the right page. Give us the title of that drug.

HARKNESS: Suxamethonium chloride.

ASTBURY: Thank you. Again, another preparatory drug for intubation?

HARKNESS: Yes, it's a muscle relaxant.

ASTBURY: So plan drafted at 11 o'clock. Prescriptions being written and prepared possibly at 23.28. I'll take you to your next entry, please, which you've refreshed your memory from already and that is at tile 149, please.

So written at 01.45, doctor. Do you recognise this note?

HARKNESS: Yes.

ASTBURY: And you explain:

"Sudden deterioration at 23.40."

So this is around 40 minutes later. Do you remember where you were when this --

HARKNESS: I was still on the unit. I was getting ready to intubate electively and having everything ready, before this suddenly happening as I was there.

ASTBURY: Do you know how you were alerted to it?

HARKNESS: I was in the room when this happened.

ASTBURY: Right. Anyone else in the room at the time?

HARKNESS: Nurse Letby was there. I believe there was another nurse there because they were together making up the drugs to be given for the elective intubation. I can't remember who else was in the room at that time.

ASTBURY: And then talk us through, please, your observations to the right-hand side of that page.

HARKNESS: I have put:

"Bradycardia [which is slow heart rate] of 80 to 90 beats per minute."

We want that to be above 100, so when it goes below 100 we start to be concerned:

"Saturation of 60%. Poor perfusion."

So there's -- now the fingers and toes and the arms and legs, the blood supply is more sluggish:

"Colour change over the abdomen with these purple discoloured patches."

Would you like me to go into that more?

ASTBURY: In a moment. Just before we do that, between 23.00 and 23.40, we saw in your earlier entry that the baby was to be placed under close observations. Did that change over that period?

HARKNESS: No, he'd still be under close observation in the room.

ASTBURY: And again would that be his designated nurse?

HARKNESS: Yes.

ASTBURY: The type of observations, presumably, would include all the type of figures that you've quoted, saturations --

HARKNESS: Yes.

ASTBURY: -- heart rate, all that sort of information --

HARKNESS: Yes.

ASTBURY: -- on the monitors for the nurse to monitor --

HARKNESS: Yes.

ASTBURY: -- throughout?

Describe to us, please, the colour change over the abdomen that you describe in your notes.

HARKNESS: So this was a strange pattern over the tummy area, over the abdomen, which didn't fit with the poor perfusion.

In between the kind of chest, upper legs, the rest was still pink, but there were these kind of strange purple patches that appeared over the outside of his tummy.

ASTBURY: Pausing there, you are moving the palms of your hands around your abdomen to different places, as you do it.

Were they static, these patches?

HARKNESS: From what I remember there were patches in one area, then there were some in the other. Some of it was still nice and pink. But it certainly was unusual and not fitting with a baby that had completely shut down with its -- or poor perfusion.

ASTBURY: Just breaking this down, perfusion was poor. How is that assessed?

HARKNESS: That's assessed by looking at the capillary refill time, but also when you look at the body, if you're looking at the arms and legs, you'll notice that rather than pink they'll be dusky, so more of a purplish colour. A different colour to this: this was kind of a purply-blue colour. The best example would be if you go for a swim in the cold and you come out and you get that blue around your lips, we would call that a dusky colour and that's what you tend to see. So this was different in colour and different in pattern to what you would see from a perfusion perspective.

ASTBURY: Perfusion being the skin to --

HARKNESS: The blood supply to the surface of the skin.

ASTBURY: And when you were talking about pink a moment or two ago, tell us what was pink.

HARKNESS: His head was pink, his upper legs, upper arms, chest was pink. The abdomen was purple. Purple patches.

ASTBURY: A pink colour you'd expect to see?

HARKNESS: Yes, a normal skin colour that any well person would have.

ASTBURY: So these purple -- how would you describe them, purple...?

HARKNESS: So patches, so not one solid purple area. I'd say one purple patch to the bottom, one purple patch to the top.

Some in between. I can't remember exactly where they were. But they were -- where they were didn't fit with a particular

anatomical part of the body. It's very difficult to describe. With not having any photos or anything like that and this not being something that that I've seen.

MR JUSTICE GOSS: Not seen what, you were saying?

HARKNESS: Not seeing it outside of the babies in this case, it's difficult for me to describe it in any clearer details.

MR ASTBURY: I was about to ask you how big the patches were, but let's just deal with that point now. Had you seen it before?

HARKNESS: I'd seen this in [Baby A] and that's the only other time prior to this that I'd seen it.

ASTBURY: Okay. Have you seen it since?

HARKNESS: Not outside of the babies in this case, no.

ASTBURY: This is back in 2015. Are you still practising as a paediatrician?

HARKNESS: Yes, I'm a paediatric consultant now.

ASTBURY: So I was going to ask you how big these patches were.

Are you able to estimate the size or were they different?

HARKNESS: They were different sizes, they weren't small dots, they would have been relative to the size of the baby they were in the region of 1 to 2-centimetre patches, possibly bigger, but I wouldn't say any smaller than that.

ASTBURY: You're moving your hands around while you're describing --

HARKNESS: Sorry.

ASTBURY: Obviously this is being audio recorded and not video recorded. Are you moving your hands because they moved or just to indicate the different locations?

HARKNESS: (Indicating). The areas were over the abdomen, so not up on the chest, not below his groin, just in the middle section. From what I remember, it did change where they were, they were purple in one area and then they were purple in another, which again was strange in that you'd expect if it was something like perfusion, once your perfusion is poor to an area it tends to stay poor until you've done something to change the situation.

ASTBURY: I was about to ask. When you started to tell us about them, you said they didn't fit in with the perfusion you could see.

HARKNESS: No.

ASTBURY: Is that what you were talking about?

HARKNESS: Yes.

ASTBURY: You would expect the area to stay the same if there was a problem?

HARKNESS: Yes. If I was to expect that his abdomen was dusky or white from perfusion, I would expect, at that point, his whole body to look the same because it tends to move -- feet and arms first, moves towards the body and the head. So to have a pink head and a pink chest, pink upper legs, and have this in the middle doesn't fit with a pattern of poor perfusion.

ASTBURY: It might be an obvious question, no doubt I'll be forgiven, but why does this paleness or lack of perfusion start at the ends of hands and feet?

HARKNESS: The way our bodies work to survive is if there's something that's affecting our blood supply, we want to protect our organs and our body would rather lose arms and legs than it would lose the organs, so it protects the brain typically, the heart, to a lesser extent the kidneys, the liver, the bowels, but it will pull all of the blood in your body that it can into the middle, so the middle tends to stay pink for longer and the outside -- same as when you get cold, essentially, to heat up your body, to keep everything working, the outside gets cold and changes colour and the middle stays a better colour.

ASTBURY: But on this occasion it's the middle where you're seeing these discolourations?

HARKNESS: Yes.

ASTBURY: Discolourations consistent with any symptoms that, even if you hadn't seen them, you were familiar with?

HARKNESS: Nothing I'd seen before, no, or since.

ASTBURY: Next line, Dr Harkness:

"Intubated as an emergency at 23.45."

HARKNESS: Yes.

ASTBURY: You have already dealt with the distinction between elective and emergency. But why had it become an emergency?

HARKNESS: So because we've now got this dropping in heart rate and the perfusion has started to change, the timing is a lot more imminent, but I need to get on and do this now, although it's more uncomfortable for the baby, the risk of still giving those medications and taking my time outweighs the benefits to the baby. Also, the medications that we give can also theoretically drop blood pressure, so if your blood pressure is okay but your heart rate is going fast, the last thing we would want to do is tip the balance -- sorry, if your heart rate is going slow, it will continue to go slow, not fast, and the saturation -- the heart -- blood pressure could drop. At this point the safer option is to do things as an emergency and not give the drugs.

ASTBURY: Okay. Next line, please.

HARKNESS: I have put:

"Anterior cords, able to pass size -- unable to pass size 3 ET tube."

ASTBURY: I'm going to ask you, anterior cords, what are they?

HARKNESS: Your vocal cords sit at the top of your windpipe. Most of the time they sit nicely in the middle, so that when you go to look with a laryngoscope, they sit in a nice view and it's quite easy to pass a tube. Sometimes they can be off to the side or they can be anterior, so slightly further forward, so if they are slightly further forward it makes it more complicated to put the tube in.

So what I've done is I've gone in with a size 3, which is the width of the tube, and because of where the cords were and the view I've got, wasn't able to get that to the place that I wanted it.

ASTBURY: Are you able to say what effect did you view?

HARKNESS: It's the anatomy, it's the way that the body -- different people's bodies aren't the same. I would say anterior cords are relatively common. They do make it more difficult. There are ways and means around correcting it, with smaller tubes being the most common way to do it, which is what I've then gone on to say as I've used a size 2.5 tube, passed on my second attempt, and I've passed that 7 metres -- not metres, 7 centimetres from the lips down into the windpipe.

I have then commented that the air entry was good and there was good chest movement. So if the air entry is -- if I can hear that there's air getting into both lungs and the chest is moving then I know that that tube is in the correct position.

We've also got something called a capnograph, which looks at the carbon dioxide coming from the lungs. If you are breathing or you're being -- the breathing is done for you, carbon dioxide will come out of your lungs and it will change colour. So between all of those factors, I'm happy that my tube is in the correct place.

ASTBURY: And the capnograph tells you that gases are passing in and --

HARKNESS: Passing in and passing out, yes. It tells you that your -- you've got the gas exchange as well. So you have to have your heart beating as well as your lungs working to get the blood circulating for the carbon dioxide to come out.

ASTBURY: Then I think you've entered the settings on the ventilator?

HARKNESS: Yes, at this point he's awake and this is synchronised, so this means it will try and match up with his breaths.

Pressure of 22/5, which is an average place to start.

Still needing 100% oxygen. And I put the rate of breathing at 60. So his normal breathing would be when he's well, or a baby's normally well, 30 to 40. So 60 means I'm just pushing it a little bit harder to try and get that oxygen circulating a bit better.

ASTBURY: We've then got an entry concerning his sats. 60 to --

HARKNESS: 60 to 70%.

ASTBURY: Is that after or before you have intubated?

HARKNESS: This is whilst I've intubated?

ASTBURY: Right.

HARKNESS: Sorry, after I've intubated they're still low.

I have then given morphine as a bolus. So if babies are on the ventilator and they're still quite active -- and one of the benefits of the elective intubation is that the morphine will sedate them and keep them more comfortable. So what I have done

there is, because he's uncomfortable because of the emergency, I have given the morphine and, after having the morphine, his saturations have come up to 80%. So that suggests he is now more relaxed and more comfortable.

ASTBURY: There's then a comment about the purple discolouration again.

HARKNESS: So this purple discolouration, I have put there, has remained on the abdomen, his blood -- I have then put his cuff blood pressure, so a cuff being on the arm -- we can check blood pressures centrally through putting catheters in but this will be from a blood pressure on his arm and this has now dropped to 36, which is still, for his gestation, still reasonable but starting to decrease.

So my plan at this point was to give a further fluid bolus to help with his blood pressure. I then thought about medications called inotropes. Inotropes help your heart beat stronger and they can make it beat stronger and also in combination make it beat faster. So if your blood pressure is dropping, we tend to think about these medications to get things pumping faster and stronger to help keep the blood pressure up and get the blood supply going better.

What I then put is "could worsen bleeding". So my concern at this point in time is if I'm making the heart beat faster and stronger, is this actually going to make him bleed more rather than not. So this was me -- that was one of my thoughts at that point in time.

ASTBURY: I'm going to ask you to pause there because in your note of 22.10, there's a clear reference to blood, and in the note at 23.00, there's a clear reference to blood. Was there still -- was blood still a feature during the course of this episode or not?

HARKNESS: From my recollection, there was no further bleeding after -- at this point in time the bleeding had settled.

There was later further bleeding. But from my recollection, I can't remember there being substantial amounts of blood at this point in time.

ASTBURY: Your next entry, please.

HARKNESS: The next entry is "[query] FFP", which is fresh frozen plasma. That contains clotting factors, so there's a possibility in small babies that they don't have the ability to clot properly and so what we do is we can replace -- between a couple of different products, we can give them more. At this point in

time we didn't know if there was anything wrong with his clotting, so not having anything available would mean that -- unsure of the benefit. Any blood product you give comes with the risk of a reaction. So at this point it was felt that we needed those blood tests back before we gave that.

ASTBURY: Is that the next line, which says:

"Bloods sent for coagulation and cross-match"?

HARKNESS: Cross-match is what you do if you want to give -- ton find out someone's blood group. So before you give blood, what you need is to know their type. You can give universal donor blood in an emergency, but ideally you give one that is matched to the baby's blood type.

It reduces the risk of reaction.

So at this point we've arranged for those and I've again discussed this with [Dr C], who was happy with that plan, and she was going to come across to review the patient as well.

ASTBURY: Coagulation, so everybody understands?

HARKNESS: Sorry, that's the blood clotting. So it will look at how long it takes for your blood to clot with various sophisticated tests that they do in the lab.

MR ASTBURY: Okay. We can come back to that in due course.

My Lord, I'm conscious we started a little bit later than anticipated. I just observe it's now 12.30.

MR JUSTICE GOSS: Well, yes. I'm becoming a little anxious now because we haven't got a full afternoon ahead of us.

MR ASTBURY: I'm couching it as neutrally as I can.

MR JUSTICE GOSS: About how long further do you think you'll be examining Dr Harkness in chief?

MR ASTBURY: Twenty minutes, I'd imagine, or so.

MR JUSTICE GOSS: I don't know how long you're likely to be.

MR MYERS: Maybe about an hour or so, my Lord.

MR ASTBURY: We're not going to finish today.

MR JUSTICE GOSS: Unless we have a much shorter lunch break.

Unless you want a break now, let's try and finish the examination-in-chief, get this 20 minutes done, then it's all in one piece. And then we will see where we are.

Press on, please.

MR ASTBURY: Thank you.

So we finished your note in respect of the event at 23.40. Again, we know, because we've been through the notes in advance, that the next record, although it's not yours, you were there, and it's at 1.30 in the morning. Are you able, from memory, to tell us what passed between events we've just been discussing and the next event at 1.30?

HARKNESS: So what was quite clearly remembered was that we'd started the inotropes, [Dr C] arrived and came to view that [Baby E]. We were literally stood at the end of the incubator, discussing where we were and what we'd done, before he then collapsed in front of us. By collapse I mean that then his blood pressure dropped, his heart rate stopped, and stopped breathing for himself. And that happened in front of our face as we were stood there.

ASTBURY: Do you remember in that period whether you'd left the NNU or --

HARKNESS: No.

ASTBURY: -- you had stayed throughout?

HARKNESS: Stayed throughout.

ASTBURY: How long do you think [Dr C] had been there when the event you just described to us took place?

HARKNESS: I can't remember. I think we'd had a discussion for 10 or 15 minutes -- I think she was there quite quickly after I'd had that conversation with her but I can't say exactly how long that was.

ASTBURY: Again, we've got the benefit of the note. Tell us, please -- well, we've got:

"On my arrival around 00.25..."

Again, I am conscious this is [Dr C]'s note, not yours.

MR JUSTICE GOSS: We have not got this. You've got it on the sequence of events.

MR ASTBURY: Sorry, I thought it was up. I'm racing ahead, I do apologise.

Can we go to tile 160, thank you, and the note behind it.

MR JUSTICE GOSS: We went through it yesterday with [Dr C]. The jury will be familiar with it, but Dr Harkness can go through it.

MR ASTBURY: Yes, from Dr Harkness' perspective, of course.

We have a note from [Dr C] and it sets out initially what we were told she was informed on arrival.

Then a series of results: saturation, air entry, heart rate. Are they consistent with your recollection of [Baby E]'s condition when she arrived?

HARKNESS: Yes, I think that reflects what I've written in my entry. They're pretty much the same observations or thereabouts. The heart rate has come up above 100, so that's improved. The saturations were as I recalled and the blood pressure stayed around about the same place.

ASTBURY: We can see reference to a chest X-ray --

HARKNESS: Yes.

ASTBURY: -- and what she saw on there. Then an entry beginning at 12.36 am; just after half past midnight. Is that the event you started to tell us about a few minutes ago?

HARKNESS: Yes.

ASTBURY: Is it your recollection that those, certainly the saturations fell to that level of 50 to 60, despite there being 100% oxygen --

HARKNESS: Yes.

ASTBURY: -- provided.

"No detectable heart rate." Was CPR commenced then?

HARKNESS: Yes.

ASTBURY: All right. We've heard a little bit from [Dr C], I'm not going to repeat it, about the next entries. There are a series of medications or interventions that were attempted. Do you recall that?

HARKNESS: Yes.

ASTBURY: At one point we were told that, round about 01.01, [Baby E]'s heart recovered.

HARKNESS: Yes.

ASTBURY: Do you remember [Baby E]'s parents being present by this stage?

HARKNESS: Vaguely. But I can't remember exactly when they arrived. I know they were there for some...

ASTBURY: Tell us, please, then from your own recollection what, if anything, you can remember from the attempts to resuscitate [Baby E].

HARKNESS: So one thing I remember, and it's alluded to there, is the likely arterial -- is that I cannulated him during the resuscitation to get a blood gas. The blood supply was incredibly poor. This was when he had a heart rate.

Normally, you'd expect things to bleed quite freely once your blood pressure is going and if you hit an artery then, as you've seen on the telly, things tend to bleed quite a lot quicker, and where I'd put the cannula, it bled like it was a vein, but during the CPR the blood started to shoot quite quickly out. So it suggested that the blood -- at that point his blood supply, the amount of blood left in his body was low.

I remember through the CPR there being quite a lot of significant blood coming through the -- although the amount wasn't particularly -- it wasn't very nice.

ASTBURY: So just pausing there. You fitted a cannula --

HARKNESS: Yes.

ASTBURY: -- to what you believed was an artery?

HARKNESS: Believed was a vein at the time, but during the process of the CPR was more evident to be an artery. So that -- the fact that that wasn't squirting blood suggested that there wasn't a huge amount of blood that was flowing.

It also is important because the blood gas that you do, it's much better if it's a -- we want it to be an arterial sample, not a sample from a vein.

So if it's very poor from an arterial sample, that's much more reliable of an indication of what's happening than from a vein.

So that's why that's mentioned there and has had an impact on why we've discontinued.

ASTBURY: You mentioned blood coming from [Baby E]'s mouth too.

HARKNESS: Yes. As we're squeezing on the chest, there's blood coming out of the -- around the nose and mouth during that resuscitation.

ASTBURY: If we go, please, to tile 164. Again, not your note, but taken at the time. That's the timeline of the resuscitation if you agree. You're nodding your head.

HARKNESS: Yes.

ASTBURY: That, you agree, that's consistent with your recollection?

If we go down to that entry at 01.01, [Baby E] had been or attempts to resuscitate [Baby E] had been going on for about 14 minutes at least. Was that an unexpected development?

HARKNESS: For the heart rate to come back?

ASTBURY: Yes.

HARKNESS: From that period of time, yes, once you're kind of going for 10, 15 minutes. The longer it happens, the less likely it is to come back. Ten, 15 minutes is -- I wouldn't personally want to go on longer than 20 minutes. So 10 to 15 minutes is pushing -- is where you would start thinking about whether it's time to stop what you're doing. So it's quite a long time to be doing it.

ASTBURY: Clearly, attempts then continued, given --

HARKNESS: When the heart rate comes above 60, you would stop doing the chest compressions. Now this is around 90 to 100, you would stop doing the chest compressions, but help -- still continue to breathe for him.

ASTBURY: We can see that then, sadly --

HARKNESS: Things have started to drop again --

ASTBURY: -- (overspeaking) heart rate began to fall and eventually CPR was stopped?

HARKNESS: Yes.

ASTBURY: You told us of the discolouration on [Baby E]'s abdomen, that you'd not seen anything like that before, save for [Baby A], and had not seen anything like it since.

Had you seen bleeding to this extent before?

HARKNESS: No. No. I've seen it in a teenager. I have never seen this in a baby to this extent.

ASTBURY: Does that include the period since events in --

HARKNESS: Yes, that's from working on neonatal units and all my time since. I have never seen it again.

ASTBURY: Okay. We looked at the nursing notes earlier, prepared by, everyone agrees, I think, Ms Letby, during the course of the shift. Have you seen those notes on a previous occasion?

HARKNESS: I saw them when I did my statement a while ago now.

ASTBURY: Okay. And did you have any observations about the note when you provided your statement?

HARKNESS: What do you mean, sorry?

ASTBURY: Well, having seen the note, did you comment upon the content of it to the officers when they were speaking to you?

HARKNESS: Yes, I believe so.

ASTBURY: Did anything strike you as unusual?

HARKNESS: Not in my recollection.

ASTBURY: We'll go to the notes. It's tile 126 to begin with. If we can go to 127. It's the entry in the next page that you were shown. That's the one. If we can go to the page behind. That bottom left-hand entry, please, Mr Murphy.

Was that the note that you were shown?

HARKNESS: Yes.

ASTBURY: What were your observations?

HARKNESS: I didn't know what they meant, what the "contained [Baby E]" meant. It's certainly not a word that I would ever use. And what that refers to. Otherwise the timing fits roughly around when I was called.

ASTBURY: Okay. Finally this: we spoke about a blood test earlier for -- just looking at that note, when you went at 10.10, or thereabouts, I think you said probably a little bit earlier by the time you wrote the note, was [Baby E]'s mum present?

HARKNESS: I can't remember from my recollection. From the notes I've obviously spoken -- I would have then spoken to the parents, but I don't remember whether they were there exactly when I arrived.

ASTBURY: Moving on from that, you mentioned clotting and getting that blood sample for clotting analysis and cross-matching; is that correct?

HARKNESS: Yes.

ASTBURY: And I think that came or the results that came through later in the shift. Can I ask you just to look at that, please, which is J2704.

We can see there that the result was received, it's in the middle of the page -- first of all, is that the blood result that you were referring to?

HARKNESS: Yes.

ASTBURY: We can see it was received at 01.07 on 4 August. In fact, it was made available during the course of [Baby E]'s resuscitation.

If we look, please, at the last two lines, "PT"?

HARKNESS: PT is the prothrombin time. That looks at part of the way your blood clots, which was 19.5, which is ever so slightly high. The difficulty with these -- what we call the reference ranges, where it says 12.5 to 15, they are based on adults. Same with the 26 to 35. So although they look high, they're not as high -- they're not particularly high enough for me to be shocked by.

ASTBURY: Right.

HARKNESS: APTT, again I don't have the neonatal reference ranges in front of me, but for certain gestations 50 is within the normal range from my recollection.

ASTBURY: Okay. Just breaking that down, the first figure is the result, so that's the time that the clotting would have taken; is that right?

HARKNESS: Yes.

ASTBURY: Then we have an H?

HARKNESS: For high, yes.

ASTBURY: And then a range?

HARKNESS: Yes.

ASTBURY: I think your evidence is that that range is in fact for adult patients?

HARKNESS: Yes.

ASTBURY: So would not necessarily be relevant to the readings we can see to the left?

HARKNESS: No.

MR JUSTICE GOSS: Sorry, that's the blood clotting figure?

Is the APTT another blood clotting figure then?

HARKNESS: There's PT and there's -- don't ask me what APTT stands for.

MR JUSTICE GOSS: But what does it --

HARKNESS: It's another -- there's two different types that your -- blood clots.

MR JUSTICE GOSS: It's another blood clotting measurement?

HARKNESS: It's another blood clotting measurement, yes.

MR JUSTICE GOSS: Right. And that was 53.6, said to be high, and the range was given as 26 to 35. The s, is that seconds again?

HARKNESS: Yes.

MR JUSTICE GOSS: Is that for adults as well?

HARKNESS: Yes.

MR JUSTICE GOSS: So that one is high as well, for an adult.

HARKNESS: They're both high. I'm not an expert on the neonatal ranges. So I can't comment on what the exact ranges are, but the ranges for a neonate are higher than the ranges for an adult.

MR JUSTICE GOSS: Right.

MR ASTBURY: Thank you, my Lord.

MR JUSTICE GOSS: Thank you.

It's very difficult, this, now. I don't want you to feel under any pressure of time. But if you think it will be completed within an hour, we could just have a 40-minute lunch break.

MR MYERS: I'm aware of the timings that the court is working to. I'm a little anxious that whilst I proceed as briskly as I properly can, there is a danger we could run beyond an hour and it'd be unfortunate if we run over by a matter of minutes or 10 minutes or something so we have to come back tomorrow to deal with Dr Harkness for that. I'm in your Lordship's hands.

I'm anxious at nailing down 1 hour when the potential for it to be 15 minutes longer is there.

So I would like to proceed if I could, but I don't want to inconvenience the court, the jury, your Lordship or the witness by running beyond the time we're trying to finish at if we take a break.

MR JUSTICE GOSS: Right. Look, we're using up time discussing this.

MR MYERS: Maybe if we take half an hour or something, if people can tolerate that.

MR JUSTICE GOSS: Is half an hour all right for you? I'm looking to the senior officer; yes?

MR MYERS: I'd like to if I could, my Lord.

MR JUSTICE GOSS: Is half an hour all right for you? We'll say 1.20 then.

MR MYERS: I apologise for the longer time, but just in case.

MR JUSTICE GOSS: No, it's better to err on the side of caution. So just a half hour break, please, Dr Harkness. Remember, don't talk to anyone about this case or your evidence. Thank you very much.

Dr Harkness has travelled some distance to be here, so...

(12.50 pm)

(The short adjournment)

(1.20 pm)

Cross-examination by MR MYERS

MR MYERS: Dr Harkness, I'd just like to clear one matter up right at the beginning. You said that when you were shown Ms Letby's notes, you thought the expression "contained" was rather odd, where it refers to containing [Baby E]. Just so that you know and to remind us all, on Monday this week, [Baby E]'s mother, [Mother of Babies E & F], gave evidence and when describing how she handled [Baby E] she said:

"I immediately went to [Baby E] and because -- when the boys were born we were told to use a containment technique which is putting your hand on the baby's head and on the tummy to make them feel like they're still in your tummy."

HARKNESS: Okay.

MYERS: So if you didn't know, that's what that is.

HARKNESS: Okay.

MYERS: I'd like, first of all, to get as clear as we can, in general terms, the order in which these events happened.

We have your notes, we also have a statement that you wrote to the -- made with the police on 17 October 2018.

Do you remember making that statement, Dr Harkness?

HARKNESS: Yes.

MYERS: That statement was made a little more than 3 years after the events that we're dealing with, but obviously, 4 years before now. You have to say yes or no. Nodding won't --

HARKNESS: Yes.

MYERS: Or you can say no, but you have to answer.

HARKNESS: That is correct.

MYERS: You said when you were giving evidence earlier that it was difficult to remember the exact times of certain things, but you said:

"It should be documented in my statement."

So I'm going to, first of all, with the assistance of your statement, go through the order in which things happened and look at some of the detail.

I'm going to suggest to you there are four particular stages. First of all -- we will come to your statement in a moment, but first of all that you reviewed [Baby E] because Nurse Letby asked you to do so and you saw a dirty aspirate.

HARKNESS: Yes.

MYERS: I'm going to say that's the first stage.

Then, about half an hour later, second stage, there was fresh blood up the tube, on the tube, the reference to the vomit and the blood.

HARKNESS: Yes.

MYERS: That's about half an hour later. Both of those appear in the same clinical note.

There is then a third episode of bringing up fresh blood, another 14 to 15ml.

HARKNESS: Yes.

MYERS: And then, there is the sudden deterioration with the colour change, as you describe it, at which point [Dr C] is asked to come in --

HARKNESS: Yes.

MYERS: -- and we go from there.

Just to assist with the order of these things and using your statement, I'm going to ask if you can be shown, and his Lordship and the barristers, page 1408.

So we are going to go to page 2 of 7, Mr Murphy.

I think the easiest thing is for me to read this section with you and you to confirm this is what you said to the police. The bottom of page 2 of 7, starting with "I was asked by".

We will be going to the notes shortly, but I'll go through this and I'll also identify, for the jury's benefit and his Lordship's, which notes this refers to and then we'll go to the notes.

Having dealt with general matters in the statement, you say this -- this is what you say:

"I was asked by Nurse Letby to go and review [Baby E] within the NNU as he had suffered a vomit which had flecks of blood in it, which -- we would refer to this as a dirty aspirate."

That's what it says, isn't it?

HARKNESS: Yes.

MYERS: "Lucy would have bleeped me and I came relatively quickly as there wasn't anything else going on. Looking at the timing of the notes, it was 22.00/22.30."

I'm going to come back to the timing in a few minutes.

HARKNESS: Okay.

MYERS: "I only came on the shift at 21.00."

That relates to the initial review of the dirty aspirate, doesn't it?

HARKNESS: Yes.

MYERS: For our reference, ladies and gentlemen, that's slide 128, page 1, and we'll come back to that in a moment.

You go on to say this:

"Quite often, due to the babies have a feeding tube in place, this can cause slight irritation. I would describe this initial staining as bits of mucus with stringy bits of blood and flecks. I would have looked for signs of distress within [Baby E] and also checked his heart rate levels."

That's what it says, isn't it?

HARKNESS: Yes.

MYERS: And that's what you were describing to the police 4 years ago, isn't it?

HARKNESS: Yes.

MYERS: "The mucus would be from the tube into their stomach and I think that we left the tube on free drainage. Quite often the tube would be left in and there is a little bung in the end, but we attached it to a syringe so if [Baby E] was to vomit, this would come up the tube. I am unsure of whether Nurse Letby was

present in nursery 1 during my examination of [Baby E] and I cannot be certain of whether there was a fleck or two of blood around [Baby E]'s face but there certainly wasn't anything dramatic. Otherwise, at that point [Baby E] appeared fine and his observations had been all okay, so he was prescribed ranitidine, which can help to settle down the lining of the stomach. We also sent some of his bloods off to check his clotting. I may have left the unit after the initial blood, but I cannot be certain.

"Whilst in the NNU I am either in the nursery or at the nurses' station. Ranitidine is not a medication that would be prescribed very often, particularly for bleeding, so I am sure I would have mentioned this to the senior nurses. It is not indicated within the notes who I would have spoken to but this is the just usual process. Again, at that point [Baby E] looked relatively settled and there was nothing to suggest that anything else was going to change."

That's the first part of the incident.

HARKNESS: Yes.

MYERS: For those who are following it on the iPads, that's at slide 128. I'm afraid we're using the screens at the moment to assist Dr Harkness.

Next, you say this:

"However, around half an hour to an hour later, there was a large amount of fresh blood, which came up [Baby E]'s tube."

MR JUSTICE GOSS: "Which had come up."

MR MYERS: "Most of this had been collected in the syringe. This situation is more unusual and I can't say I have seen many babies that have developed sudden bleeding. From memory I believe it was around 12 to 14ml of blood, which for a baby of that size is a substantial amount."

That's what you say, isn't it?

HARKNESS: Yes.

MYERS: And that's how you remembered it. Then the third episode, which takes us to our slide 128, page 2:

"[Baby E] then suffered a further episode of bringing up fresh blood and again it was another 14 to 15ml of blood. I had not seen bleeding like this before" --

MR JUSTICE GOSS: "Sudden bleeding."

MR MYERS: Apologies, my Lord:

"I had not seen sudden bleeding like this before or have seen [it] since. I have seen extremely premature babies gestation of 23 or 24 weeks' gestation who have sepsis or other problems where their clotting is very deranged, but these babies start to bleed when we put in cannulas or have done sampling and they bruise very easily. I have not seen a case that has occurred suddenly out of nowhere."

Then you say:

"I don't think I left the unit after this second event and I recall having several telephone conversations with [Dr C] about what we thought was going on and the possibilities of medication and clotting factors. Whilst these telephone conversations took place, I was sat at the nurses' station."

Does that follow as best as you have a recollection, Dr Harkness?

HARKNESS: Yes.

MYERS: And then taking us to the fourth stage, which is on our slide 150, you say:

"[Baby E] suddenly deteriorated and one of the notes I recorded was that [Baby E] had developed quite a strange colouration."

And I'll come back to that when we reach that in my questions. That takes us through the process.

So I want to go now to the start of what we looked at and your initial involvement with [Baby E]. We can take the statement down from the screens, Mr Murphy, thank you.

Could we put up, please, slide 128, page 1? Could we go behind that --

(1.31 pm)

(Loss of audio feed from court)

(1.32 pm)

MR JUSTICE GOSS: Thank you very much. Sorry about that.

MR MYERS: I'm interested at this point, let's focus first of all on timings as best we can, Dr Harkness, looking back.

Events or stages 1 and 2, which is the initial review of [Baby E], as you said in your statement, because you were asked to, and then the blood that came up half an hour later are both recorded in this one note, aren't they?

HARKNESS: Yes.

MYERS: Right. You started to record what happened in this note at 22.10, didn't you?

HARKNESS: Yes.

MYERS: So we know that by 22.10, a number of things had happened. We know that you had been asked to review [Baby E]?

HARKNESS: Yes.

MYERS: That's right, isn't it?

HARKNESS: Yes.

MYERS: It's the first part of the review where you've described seeing the aspirates with the bits of mucus and the flecks in it; is that correct?

HARKNESS: Yes.

MYERS: We know that you'd assessed him as part of that review, hadn't you?

HARKNESS: Yes.

MYERS: In your statement you said you weren't sure whether or not you left the unit.

HARKNESS: Yes.

MYERS: But we know that about half an hour passed and then he brought up fresh blood.

HARKNESS: Yes.

MYERS: Right. And we know also that you spoke with [Dr C] about it?

HARKNESS: Yes.

MYERS: Now, all of that had taken place by the time you started to write this at 22.10, hadn't it. It must have done.

HARKNESS: Sorry, are we talking about which entry now? 22.10?

MYERS: Yes.

HARKNESS: Yes, I think this is where I've started to document -- so can we look at the next page, please?

MYERS: Yes, sure. Can we go over the page, please? We can see, "Spoken with [Dr C] at the end".

HARKNESS: Yes.

MYERS: Do you see that, still 22.10, in the left-hand side?

HARKNESS: Yes.

MYERS: So all of what I have just described to you, and you agreed took place, had happened by 22.10, by 10.10 in the evening.

HARKNESS: Yes, looking through it and putting it together, yes.

MYERS: Well, it must have done if you've written about it.

HARKNESS: This is a period of 40 minutes, 8 years ago, I can't be more precise than looking at my timings on there, but yes.

MYERS: That's right. So I was going to suggest to you what we're looking at will have taken a total of something like 45 minutes, give or take a little bit.

HARKNESS: Yes.

MYERS: Which means that you must have come on to the neonatal unit, looking at the time there, maybe a little before 9.30 at the latest?

HARKNESS: Potentially, yes.

MYERS: Potentially. Given all that you've done and the half an hour that passed between the two incidents and speaking to [Dr C], that's going to be about 45 minutes plus, isn't it?

HARKNESS: Yes, that would match up with the time I've written there.

MYERS: Which is why I suggest to you, looking at the time you started to write that note, you must have come on to the unit maybe a little before 9.30 pm.

HARKNESS: Yes, in retrospect, yes.

MYERS: Now, you've explained to us that your shift would have started over on the paediatric ward, the children's ward; is that correct?

HARKNESS: Yes.

MYERS: And there were two doctors on duty on that shift at the hospital, dealing with paediatrics, paediatric accident and emergency and neonatal, and that was you and senior house officer, Dr Christopher Wood?

HARKNESS: Yes.

MYERS: In the statement you said that you had been bleeped.

You said:

"Lucy would have bleeped me and I went to the NNU."

HARKNESS: Yes.

MYERS: You say she would have done. Do you know for sure that's what happened or could you have been asked to go there having received a message?

HARKNESS: I potentially could have been asked, but the common -- most common approach was a bleep.

MYERS: So you're basing what you say about being bleeped on what would generally be the reason for going?

HARKNESS: Yes.

MYERS: When you got there, you saw, as you described, a dirty aspirate?

HARKNESS: Yes.

MYERS: Which, from your recollection, may have contained flecks of blood in it; is that correct?

HARKNESS: May have done, yes, and bile.

MYERS: And bile. Mucus with stringy bits of blood; is that correct?

HARKNESS: Yes.

MYERS: When you made the statement to the police talking about this, you said:

"I cannot be certain of whether there was a fleck or two around [Baby E]'s face. There certainly wasn't anything dramatic."

HARKNESS: Around his face.

MYERS: Yes, that's what you said.

HARKNESS: That was -- my recollection was there certainly wasn't large amounts of blood over his face following that first incident.

MYERS: He didn't exhibit any signs of distress from recollection, did he?

HARKNESS: No.

MYERS: You told the police he appeared fine. Can you recall precisely when it was that you did see his mother on the unit or do you not know?

HARKNESS: I don't know.

MYERS: Do you agree you did see her?

HARKNESS: From looking at the notes, at that point, yes. But again, I can't remember --

MYERS: You don't have a clear recollection?

HARKNESS: No.

MYERS: I'm not going to try to get you to commit to something you don't have a clear recollection about.

I'm going to now look at the note. Can we go back to the page beforehand, Mr Murphy. We now know, where it says:

"ATSP re gastric bleed. Large, very slightly bile-stained aspirate, 30 mins ago."

That's one event. And then when we get to:

"Sudden large vomit of fresh blood and 14ml aspirate."

That's the next one.

HARKNESS: Yes.

MYERS: And that came about half an hour later?

HARKNESS: Yes.

MYERS: All right. You had no particular concerns by the first event, the large very slightly bile-stained aspirate that wasn't a particular concern, was it?

HARKNESS: No.

MYERS: The large vomit of fresh blood and 14ml aspirate is or was a far more serious situation, potentially, wasn't it?

HARKNESS: Potentially, yes.

MYERS: Potentially. If we just go over the page, please, so we're looking -- sorry, roll down, Mr Murphy, if you would, please, to the second half of the notes.

A few lines down we can see that even at this point, your diagnosis was a gastrointestinal bleed, wasn't it?

HARKNESS: Yes.

MYERS: Unknown cause, but that's what you thought was or may be happening?

HARKNESS: Yes.

MYERS: In a premature baby like [Baby E], a gastrointestinal bleed that has led, at least by this point, to a large vomit of fresh blood and 14ml of aspirates is serious; do you agree?

HARKNESS: Potentially.

MYERS: Potentially. Your treatment plan, if we look at it, was to give ranitidine, which is an antacid, isn't it?

HARKNESS: Yes.

MYERS: And is it --

HARKNESS: Metronidazole.

MYERS: That's an antibiotic, isn't it?

HARKNESS: Yes.

MYERS: And to continue observations?

HARKNESS: Yes.

MYERS: I'm going to suggest, Dr Harkness, that even at this point, if you were diagnosing a GI bleed, the thought of a transfusion is something that you should have had in mind.

HARKNESS: Not immediately, no. A large vomit can be enough to cause a bleed, we call it a Mallory-Weiss tear. If there was any suggestion of his observations being unusual then, yes, I would have gone straight for an emergency transfusion. But at this point in time I still have the option -- as we go on, I have given fluids which are a quicker, safer way of giving blood, but no, at this point in time I still think I wouldn't have done anything different.

MYERS: Certainly there's no reference to transfusion in the notes is there? We don't see one.

HARKNESS: Not here, no.

MYERS: No. So nothing that crossed your mind?

HARKNESS: About giving blood at this point in time?

MYERS: Yes.

HARKNESS: Not at this point in time that I have documented, no.

MYERS: So it's nothing that you would have discussed with [Dr C] at this point then, is it?

HARKNESS: It potentially would have come up in the conversation.

MYERS: Well, if it came up in the conversation, why is not documented here?

HARKNESS: I can't answer that.

MYERS: If you're talking about transfusions, that's part of the plan, isn't it?

HARKNESS: The plan wasn't to give the blood.

MYERS: So your evidence is it doesn't appear on the plan, you didn't think it was necessary, but you might have discussed it with [Dr C]?

HARKNESS: Possibly as part of a discussion after writing this plan. After writing my plan it may have come up in discussion, I cannot be sure.

MYERS: If we just pause there and look at the -- actually, could I just go back one page before we move on, just the preceding

page. We can see there heart rate is actually 100 to 140, isn't it?

HARKNESS: Yes.

MYERS: Sats, that's the oxygen saturation, is 100%?

HARKNESS: Yes.

MYERS: In 23% air.

HARKNESS: Yes.

MYERS: And that's what you would expect, isn't it, if the heart rate is at the normal range, you'd expect the sats to be at 100%?

HARKNESS: Not necessarily, no. It depends on what problems the baby is having. You can have --

MYERS: Yes, if there's a problem that might change?

HARKNESS: Yes.

MYERS: But normal (overspeaking) --

HARKNESS: If your lungs are functioning appropriately and your heart is beating then, yes, that would go together.

MYERS: Then you would expect to see something like that, wouldn't you, at this point?

HARKNESS: Yes.

MYERS: Can we move please then to page 2, so if we scroll down the notes, Mr Murphy, to the 23.00 entry, which takes us to the third stage or the third event of what we're looking at.

When you gave evidence earlier, in fact what you said:

"It was a large amount of fresh blood and I was on the unit and called in."

Does that accord with your recollection?

HARKNESS: Say that again, sorry?

MYERS: "A large amount of fresh blood. I was on the unit and called in."

Meaning, I take it, into the nursery.

HARKNESS: Yes.

MYERS: There's here 13ml of bloodstained fluid documented, isn't there?

HARKNESS: Yes.

MYERS: That's a significant quantity of blood or partial blood for a baby, isn't it?

HARKNESS: Yes.

MYERS: We know that when he was born, [Baby E] weighed about 1.3 kilograms; is that right?

HARKNESS: I'd have to check the note.

MYERS: We know. Just so the jury can keep track of the amount of blood loss, we've had a vomit with fresh blood beforehand, haven't we, a large vomit?

HARKNESS: Yes.

MYERS: We also had a 14ml aspirate alongside that and we have more blood here --

HARKNESS: Yes.

MYERS: -- at least 13. A baby or a premature baby will contain maybe 80 to 85ml of blood per kilogram. Does that sound right to you?

HARKNESS: Yes.

MYERS: So we can keep in mind [Baby E], on those figures, would have had something in the region of 120ml of blood?

HARKNESS: Yes.

MYERS: Do you agree? I'm not saying it's precisely that. It'd be within a range.

By this point, there's been 27ml of bloodstained aspirate or fresh blood vomit, aspirate with fresh blood vomit, that has been lost, hasn't there?

HARKNESS: Yes.

MYERS: So he's heading towards perhaps a quarter, up to a quarter, of blood? That's right, isn't it?

HARKNESS: Yes.

MYERS: His sats have dropped now, his saturations are as low as 60%, isn't it?

HARKNESS: Yes.

MYERS: It's been pointed out his heart rate is still at 140 to 160.

HARKNESS: Yes.

MYERS: Remember, I asked you a short while ago the relationship between heart rate and oxygen saturation. That heart rate is relatively normally, isn't it?

HARKNESS: Yes.

MYERS: But the sats are very low, the desaturation, isn't it?

HARKNESS: Yes.

MYERS: And if things are working normally, you should see an increase in heart rate as it tries to get more oxygen round the body, shouldn't you?

HARKNESS: I would expect it to be higher than that, yes.

MYERS: You would. You would expect it to be higher. So even though it's been pointed out to us it's in a normal range, what is abnormal is it should have gone up, it should be higher?

HARKNESS: It should be higher than that if it was related to blood loss, yes.

MYERS: No, no, it should be higher than that if it's functioning properly, it should be higher than that.

HARKNESS: Not necessarily. It depends very much on what the lungs are doing at the time.

MYERS: They're desaturating down to 60%, aren't they?

HARKNESS: So it will very much depend on -- it's not quite as straightforward as that --

MYERS: No, but it's --

MR JUSTICE GOSS: Let him finish.

MR MYERS: Of course.

HARKNESS: There's multi-factors to it, it's not a direct relationship like that. There's a whole complete discussion, separate discussion regarding that and I'm not an expert witness --

MR MYERS: All right, so it's not as simple as saying that's a normal reading then, is it, a normal pairing of readings? Heart rate 140 to 160 paired with desaturation to 60 to 70%?

HARKNESS: No, but it doesn't relate directly to one going up. It fits with the other, it's not as simple a fact as that.

MYERS: It may not be, but you can't just look at that and say: yes, heart rate and saturation together paint a normal picture, can you?

HARKNESS: Blood pressure as well. You've got the mean blood pressure of 43. With blood loss that -- I would be concerned that that blood pressure would have dropped at that given point in time, without support. So that's -- you're talking about two factors. There's a third factor which you have not mentioned, and like I said, it's a lot more complex than just linear relationships.

MYERS: I am going to mention the third factor in a moment.

What I was asking you is: if we look at heart rate and desaturation, that is not a normal pair of readings is it?

HARKNESS: No.

MYERS: No. You say there might be all sorts of reasons for that?

HARKNESS: There could be. They are not a normal pairing as in they are both not normal. One is abnormal, one is normal. The pairing -- I'm not quite sure what you mean when you're coming to pairing where you are planning to go --

MYERS: Can I just be clear about this, because I asked you about this at the beginning and I thought you agreed, if the saturations drop, you'd expect to see heart rate go up as the heart attempts to get more oxygen around the body? Wouldn't you expect that?

HARKNESS: It can do, yes.

MYERS: So if the saturations have dropped to 60%, you'd expect the heart rate to rise above this normal range?

HARKNESS: Well, it has risen. It's risen from 100 to 140 to 140 to 160, but still within the top end of a normal range.

MYERS: It's risen?

HARKNESS: It's risen.

MYERS: It's risen. Blood pressure, by the way, is the last measure to change when there's a serious problem, isn't it?

HARKNESS: Yes.

MYERS: It is. So although you've picked that out you know that's the last thing to go, isn't it?

HARKNESS: Potentially, yes.

MYERS: Yes. It says under the plan:

"Discussed with surgeons with X-rays."

HARKNESS: Yes.

MYERS: Why would you be discussing anything with surgeons?

HARKNESS: So we've had blood loss from somewhere. At this point in time, we don't know exactly where it's coming from.

Once we have X-rays, I have got some information to share with the surgeons. Any form of bleeding between the GI tract will come under the surgical remit. So we would want to get advice from them to see whether they have anything extra to add. But there would be no point doing that until we have got the extra results to discuss with them.

MYERS: The surgeons aren't based at the Countess of Chester, are they?

HARKNESS: No, they're based at Alder Hey Children's Hospital.

MYERS: It's a specialist hospital for children in surgery?

HARKNESS: Yes.

MYERS: So at this point, waiting for the X-rays, you are recognising you may be dealing with a situation that is very serious indeed?

HARKNESS: Potentially, yes.

MYERS: Yes. A lot of the -- a substantial proportion of [Baby E]'s blood; yes?

HARKNESS: Yes.

MYERS: Desaturating quite dramatically; yes?

HARKNESS: Yes.

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

HARKNESS: So he's still stable based on the blood pressure and his heart rate. And he is still -- I have mentioned he was handling well and pink at that point in time. Things are changing but he is still stable enough for this not to be a crash situation.

MYERS: Are you suggesting that if a baby has lost 25% of its blood, that is not an emergency, Dr Harkness?

HARKNESS: What I'm suggesting is that we still have things to do and time to do it. So we've given the fluids that have been lost, replaced by salt water, which will help support his blood pressure and his heart rate, support his circulation, and, as I alluded to earlier, giving emergency blood comes with its own risks.

MYERS: First of all, the fluids have not been given at this point, have they? No fluids have been given (overspeaking) --

HARKNESS: This is the plan (overspeaking) --

MYERS: No fluids have been given at this point, have they?

HARKNESS: No, this is --

MYERS: Right. Secondly, saline does not replace blood in terms of what blood does, does it?

HARKNESS: No.

MYERS: And thirdly, given what you have said, where do we see any discussion here about transfusion?

HARKNESS: We don't.

MYERS: Right. Transfusion wasn't being considered, was it?

HARKNESS: Most likely yes, but I have not documented it in the notes.

MYERS: He's lost a lot of blood, hasn't he?

HARKNESS: He has.

MYERS: It's one of the obvious things -- a fairly basic thing for a doctor to bear in mind is the possible requirement for a transfusion, isn't it?

HARKNESS: Yes.

MYERS: It's not documented anywhere?

HARKNESS: It's not documented at this point in time, no.

MYERS: It's something that you had failed to consider, isn't it?

HARKNESS: I do not believe that I would have failed to consider it. It's not documented. But I do not think there is any possibility that this would not have been in discussions.

MYERS: There's no reference to accepting blood off for cross-matching at this point, is there?

HARKNESS: No.

MYERS: Cross-matching is what you do to ensure the grouping matches if there's going to be a transfusion; yes?

HARKNESS: Yes.

MYERS: Usually it's a preliminary step to a transfusion, isn't it?

HARKNESS: Yes.

MYERS: If you were thinking of a transfusion you would, at the very least, be making steps towards cross-matching the blood, wouldn't you?

HARKNESS: Yes.

MYERS: That doesn't appear, does it?

HARKNESS: No, it's in the next note.

MYERS: No. And the next note, at 23.00, I'm going to suggest you didn't mention cross-matching because it hadn't been considered.

HARKNESS: I disagree.

MYERS: I am suggesting to you that was a serious mistake.

HARKNESS: I disagree.

MYERS: This all happened 8 years ago from -- 7 or 8 years ago from now, Dr Harkness. And you are more experienced now as a doctor, aren't you?

HARKNESS: Yes.

MYERS: On the night we are looking at there was you and one SHO providing cover for a number of different units, wasn't there?

HARKNESS: Yes.

MYERS: We know he was a GP doing a four-month placement as part of his training?

HARKNESS: Yes.

MYERS: But for the two of you in terms of medical assistance on the spot you -- there was no one else as a doctor who was immediately available on the site was there?

HARKNESS: I believe [Dr C] was on site in the accommodation.

MYERS: No one in the unit, doctor.

HARKNESS: In the unit, no.

MYERS: Out of interest, what would have happened if you'd been bleeped to go to accident and emergency at this point?

HARKNESS: At that point in time I would have discussed it again with [Dr C] to say I've been called away and I would have asked her to come in at that point in time because we needed two of us for two separate situations.

MYERS: I suggest, putting aside manpower, you were out of your depth at this point, Dr Harkness?

HARKNESS: I disagree.

MYERS: And you should have called [Dr C] to come in right here.

HARKNESS: That's a discussion with [Dr C] and a discussion -- and this is a decision of [Dr C] to come in or not.

If I'd wanted her right then and there, I would have done it. But knowing that she was on site and available within several

minutes of me calling her, no, I think that's wrong and disrespectful.

MYERS: I beg your pardon?

HARKNESS: I think that's wrong and disrespectful to my abilities.

MYERS: Well, we see no reaction here in terms of transfusion to 25% of blood loss, do we?

HARKNESS: But we do have reaction. We do have replacing the losses with fluid as a temporary measure. We do have a plan of trying to find out what is happening. And we do have a discussion with the consultant.

MYERS: 23.40. Let's go to slide 150, please.

Between what we've seen at 23.00 and 23.40 you were still on the unit, weren't you?

HARKNESS: Yes.

MYERS: We'd seen that one of the parts of the plan on the last occasion was that [Baby E] should be intubated?

HARKNESS: Yes.

MYERS: I'm going to suggest to you that intubation should have taken place before what we see here when it says:

"Intubated as an emergency at 23.45."

HARKNESS: As previously mentioned, I've discussed in length what an elective intubation is and that you have the time to do it and also the benefits of an elective intubation versus an emergency intubation. We were in the process of setting up for intubation at that point in time. So no, I don't think at that point in time that an emergency intubation would have in his best interests.

MYERS: (Inaudible) and I am suggesting to you it was an emergency by 23.00 and it should have been an emergency intubation.

HARKNESS: Not for an emergency intubation. There's potential just to stabilise him further, with an emergency intubation causing him excess stress, causing him to fight against what I'm doing, and become worse and decompensate and so, no, at that point in time there was still, in my mind, and still in my mind now, time to take the steps that we were going to take.

MYERS: So by 23.40 there had been no intubation, had there?

HARKNESS: Not from the notes, no.

MYERS: And there had been no transfusion, of course?

HARKNESS: No.

MYERS: And he then deteriorated.

HARKNESS: Yes.

MYERS: Your evidence is that there was preparation being done for the intubation during this period; is that correct?

HARKNESS: Yes, the drugs have been prescribed. I wouldn't document every single movement that I'm doing in between. But that would be immediately what I would do after making that plan.

MYERS: And present on the unit, at the very least and around this area, is you?

HARKNESS: Yes.

MYERS: Dr Wood, was he present by now?

HARKNESS: I would imagine so but I can't confirm it.

MYERS: We have seen his name on the prescription sheets, haven't we?

HARKNESS: Yes.

MYERS: Nurse Simcock, as she was then?

HARKNESS: Yes.

MYERS: We have seen her preparing prescriptions.

HARKNESS: Yes.

MYERS: Nurse Letby?

HARKNESS: Yes.

MYERS: When we look at the prescription sheets we might remember the time 23.30 for Dr Wood signing off on those.

HARKNESS: Yes. Quite often the drugs are started to be made before the prescription itself is written and in fact prescriptions can be written in retrospect.

MYERS: Because if in fact he only turned his mind or minds were only turned to that at 23.30, that's a half an hour delay from when elective intubation had been requested, isn't it, or advised?

HARKNESS: I would not say necessarily that's a delay. Still at this point in time we are happy enough with him to take our time and make sure things are done properly.

MYERS: I'm suggesting to what you happened here happened because you were taking your time, Dr Harkness, and that's why there was a deterioration --

HARKNESS: I think I was taking my time appropriately, yes.

MYERS: No --

HARKNESS: We make more mistakes when rush than when we take our time.

MYERS: Only here do we see reference, in fact, to cross-matching, don't we?

HARKNESS: Yes.

MYERS: It might come a lit lower down. Can we just roll down, please? If we look down under "plan":

"Bloods sent for coagulation and cross-match."

Can you see?

HARKNESS: Yes. This is written in retrospect at 01.40 though.

MYERS: Yes, yes.

HARKNESS: This covers a large period of time.

MYERS: That's referred to here because that's what you talked about, isn't it?

HARKNESS: Yes.

MYERS: If you talked about it earlier it would have been referred to earlier, wouldn't it?

HARKNESS: This is what I've written in my own -- the -- up until the -- [Dr C] updated, this was my individual plan as opposed to what I'd discussed. This does not mean that I hadn't considered it previously. It's just with the developments and the amount of saline that I have now given, it would not be appropriate to continue to give saline past that point. This is where inotropes or blood would be much more preferable than giving any further saline.

MYERS: And Dr Harkness, the reason that appears for the first time here is because the question of blood transfusion had not been considered before this point.

HARKNESS: No, no, I refuse it accept that.

MYERS: So it had been considered but you simply hadn't noted it down before here?

HARKNESS: Yes.

MYERS: This is the point when [Dr C] decides to come in; is that correct?

HARKNESS: From looking at the notes, yes.

MYERS: Of course, the purpose of the notes is to record so we can see the decisions that have been taken, isn't it?

HARKNESS: Mm-hm.

MYERS: It's so people can see what happened and why it happened yes?

HARKNESS: Yes.

MYERS: Is it good practice if you have a child losing substantial quantities of blood not to record discussions about transfusions?

HARKNESS: I think from my point at the time I think my documentation, compared to what it would be now, was not as thorough, but the discussions would have been part of what we discussed.

MYERS: Do you agree, if you had discussed it, it should be there?

HARKNESS: In retrospect, yes. I would expect someone to write that down clearer than I have at that point in time.

MYERS: [Baby E] had been in fact haemorrhaging since 22 -- since your entry at 22.10, hadn't he?

HARKNESS: Yes.

MYERS: Because you put down "Diagnose: GI bleed"; yes? We don't see any reference to transfusions until this note which is made some time after 23.40, do we?

HARKNESS: No.

MYERS: Can we go to the top of this note please. Back to the discolouration:

"Colour change over abdomen. Purple discoloured patches."

That's how you describe the discolouration in your note at 23.40, isn't it?

HARKNESS: Yes.

MYERS: If we just scroll down please:

"Purple discolouration of abdomen remained."

HARKNESS: Yes.

MYERS: That's all it says there; yes? In fact, if you want to see what you said to [Dr C] when she came on could we go to J2556. I don't have the slide number to hand.

MR JUSTICE GOSS: I think it's 129.

MR MYERS: I'm grateful, my Lord, thank you.

MR JUSTICE GOSS: I've not checked it. 128.

MR MYERS: Slide 160 I've got in fact, but one of them will take us there.

MR JUSTICE GOSS: As we've seen before, the same information is often repeated in a number of slides. Anyway, it's in 160, is it?

MR MYERS: 160, please.

Slide 160, please.

MR JUSTICE GOSS: That's 2556, which is what you asked for.

MR MYERS: 2558. It's slide 160.

Just looking at the descriptions, if we look at the top part there, the note made by [Dr C] is "discoloured abdomen". All right? That's what she's put?

HARKNESS: Yes.

MYERS: So just having looked at both available descriptions, can we leave, please, on the screen now slide 150, which is where we came from, the description there.

Slide 150, please.

MR JUSTICE GOSS: Sorry, what do you want leaving on the screen? Leaving that on the screen?

MR MYERS: No, back to slide 150 if we could, please.

So this is what you put -- we looked at the available descriptions.

"Colour change over abdomen, purple discoloured patches."

In evidence today you described them as strange purple patches over the outside of the tummy.

HARKNESS: Yes.

MYERS: You said patches in one area, then another?

HARKNESS: From recollection, they were different areas.

MYERS: And unusual, not fitting with what you would normally expect to see?

HARKNESS: No.

MYERS: You gave a size in your evidence:

"Different sizes, not small dots."

HARKNESS: No (sic).

MYERS: You'll agree, won't you, details like that about being strange, unusual, appearing, disappearing and their size, doesn't appear in this note, does it?

HARKNESS: No. I mean this is -- my documentation wasn't forensic at that point in time. It's something that stuck with me and then, when re-explored, is something I've got further recollection of.

MYERS: When you made the statement to the police that we looked at earlier on 17 October 2018 -- and I read up to this earlier, I'll read on, it was at page 1410, but you don't need to -- you can see it if you'd like to, Dr Harkness.

HARKNESS: No, I'm --

MYERS: 1410 for the benefit of --

MR JOHNSON: If a statement is going to be quoted to a witness, he should be shown it.

MR JUSTICE GOSS: Also, I'm not being critical, but you do sometimes get the words wrong, so I think we need to follow it.

MR MYERS: 1410 then, please, which is page 4 of 7, so Dr Harkness can see it. That's just for Dr Harkness and the barristers:

"[Baby E] suddenly deteriorated and one of the notes I recorded was that [Baby E] had developed quite a strange colouration over his body. This appeared as purple and pale patches and was quite unusual."

Then you go on about the breathing.

You then go on to say in the next paragraph:

"The colour was not solid purple, it was patchy. I'd expect his entire body to go purple or pale if due to poor perfusion. If the blood supply is really poor they go white. Initially it is arms and legs and then it affects the rest of the body. It does not appear as a patch on the chest and then a path to somewhere else."

All right? So when you made that statement to the police -- two things I want to just point out to you, Dr Harkness. You refer to him developing a strange colouration, you put "over his body". You also refer to a patch on the chest and then a path to somewhere else, things like that.

HARKNESS: I'm not sure what path means and I think that's probably an error on my respect, on my part, when it comes to giving the statement.

MYERS: Or is it that because there's been so much discussion about this, details from elsewhere found their way into what you're saying?

HARKNESS: No, because at this point I've not discussed this with anyone else, I have not been aware of what I have been asked to see, no discussions have been happening.

MYERS: By the time that you made your statement in October 2018 there had been plenty of discussions about discolouration, hadn't there?

HARKNESS: What are you referring to?

MYERS: By the time you made the statement we've just looked at, in October 2018, there had been plenty of discussions about discolouration?

HARKNESS: Such as when?

MYERS: At the unit when this was all happening.

HARKNESS: There were discussions at that point in time that said this was unusual, yes.

MYERS: And people comparing what they said they had seen.

HARKNESS: I refute that.

MYERS: You make reference to [Baby B] in your witness statement, don't you?

HARKNESS: Yes.

MYERS: You didn't see that, did you?

HARKNESS: No.

MYERS: People were talking about things they hadn't seen --

HARKNESS: Yes.

MYERS: Yes. Why did you just disagree with me when I (overspeaking) --

HARKNESS: I thought you meant in the interim that I was having discussions regarding this case with other people.

MYERS: And I am going to suggest what's happened with you is other bits of details find their way into your account, don't they?

HARKNESS: No.

MYERS: Again, could we put slide 150 on the screens, please.

You agree that when we look at the description put there it doesn't describe a strange colouration over his body, does it?

HARKNESS: No.

MYERS: And that's what was said in the statement in October 2018. And it doesn't describe a patch on the chest and then a path to somewhere else, does it?

HARKNESS: No.

MYERS: You have said what you saw and it reminded you of what you saw with [Baby A]. That's what you said in your evidence, isn't it?

HARKNESS: Yes.

MYERS: I'm suggesting to you that you are putting things together after the event, mixing details and coming up with details that you didn't see, Dr Harkness.

HARKNESS: No.

MYERS: I'll just remind us of what you said when you gave evidence here a couple of weeks ago about how it looked on [Baby A]. We can see what you've documented on the notes. We've heard what you said in your evidence.

When we turn to [Baby A], just to remind us, you didn't actually include any description of [Baby A]'s discolouration in his clinical records, did you?

HARKNESS: No.

MYERS: And the jury may remember you didn't describe it in the statement to the coroner either, did you?

HARKNESS: No.

MYERS: You said this from the transcript of 20 October. You were asked:

"Question: Can you describe [Baby A]'s discolouration?

"Answer: There were patches of a kind of blue-purple colour. There were patches of bright red colour. There were white patches. They didn't fit with something you'd find on a baby's body that's not pumping blood around their body."

So when you did give a description of [Baby A]'s rash, you described it as including patches of bright red colour; yes?

HARKNESS: Yes.

MYERS: That's not something that you are describing at all with this, is it?

HARKNESS: I have mentioned the purple. The purple was the striking feature.

MYERS: Have you mentioned bright red colour with this?

HARKNESS: No.

MYERS: You went on to say:

"The patches -- I could only really show it in photos. The way a dead or dying person looks is their colour will drain. Initially they will go a very dusky purple and white. This was patches that didn't fit with -- you tend to go purple and white. It tends to be your arms and legs first, so you become paler at the outside and it tends to be more purple towards the middle."

That is what you said when you were talking about [Baby A].

HARKNESS: In the process of going from white through to purple.

MYERS: You were talking about how a dead or a dying person looks. You said they become paler at the outside and it tends to become more purple towards the middle.

HARKNESS: Yes. But this isn't the same -- that was talking about perfusion. That wasn't related to what I'd seen.

MYERS: You then said this about [Baby A]:

"Answer: This had bright red patches. It doesn't fit because bright red patches means you've got blood going round your body. It had purple patches, it had white patches, and there was no pattern I could fit with what I would expect."

"Question: All over the body?

"Answer: All over the body.

"Question: Does that include the limbs?

"Answer: Yes. So the whole body was different patches."

HARKNESS: Yes.

MYERS: That's what you said in evidence about [Baby A]. Again, going to that part, you're not describing bright red patches on [Baby E], are you?

HARKNESS: No.

MYERS: Nor in your evidence are you saying there's patches all over the body?

HARKNESS: No. I have used the word "body", I have not said "all over the body" in my statement.

MYERS: So you are pulling together different bits of descriptions, aren't you?

HARKNESS: I think it is very difficult to describe -- not only was this such a long time ago, it's also something that was so unusual that it's hard to give a clear description of.

MYERS: I suggest to you from the descriptions alone you were describing discolourations that actually looked different, aren't you?

HARKNESS: They looked similar enough for me to comment -- put this in the notes that there was this colour change over the abdomen. They may very well have looked different but they were both similar --

MYERS: I'm going to carry on to a point when [Dr C] arrives.

You have described that after she arrived, you and [Dr C] were pretty much at the foot of the cot or the bed and [Baby E] collapsed again; is that correct?

HARKNESS: Yes.

MYERS: You said.

"... standing at the end of the incubator, discussing it, and he collapsed right in front of us, in front of our faces."

HARKNESS: Yes.

MYERS: Still -- at this point we know she'd arrived at 00.25 -- there had been no transfusion, had there?

HARKNESS: No.

MYERS: So he had been bleeding, in one way or another, over a period of 2 hours, hadn't he?

HARKNESS: Yes. Although there was no further evidence of bleeding after that second --

MYERS: The reaction to his haemorrhage, Dr Harkness, was far too slow, wasn't it?

HARKNESS: I disagree.

MYERS: If we take a look, please, at slide 164, page 2560.

We can see that at 00.50, it says:

"O neg blood, 20ml/kg."

HARKNESS: Yes.

MYERS: So that is the point at which finally [Baby E] received a transfusion, isn't it?

HARKNESS: Yes.

MYERS: O neg because that blood can be used by anyone, can't it?

HARKNESS: Yes.

MYERS: And that's because the delays in cross-matching were such that there wasn't time to cross-match at this point, was there?

HARKNESS: No.

MYERS: That's because it had been left too late, isn't it?

HARKNESS: No, O neg blood is part of the standard resuscitation anyway.

MYERS: Yes, but the reason here is there hadn't been time to cross-match, had there?

HARKNESS: You would still give O negative at that point in time because even if the blood was available, the delay in getting from patient to blood fridge and back meant you'd still go for O negative blood even if the lab had cross-matched blood available for you.

MYERS: And this comes about 2.5 hours after when you had first identified a bleed, doesn't it?

HARKNESS: It does, but you can -- if you put as much blood into someone who is bleeding, it will just come back out again, which is --

MYERS: Can we look please at slide 160, please, page 2558.

If we scroll down we can see:

"On my arrival at approximately 00.25..."

Sorry, we've just gone beyond that.

MR JUSTICE GOSS: Well, I'll ask -- have it passed to counsel.

(Pause)

MR MYERS: Probably a matter for expert evidence, my Lord.

MR JUSTICE GOSS: The note is making a sensible enquiry, if I may say so, and I think the answer is that there will be evidence in relation to this, but not from this witness.

MR MYERS: No, not from this witness.

MR JUSTICE GOSS: I don't want to sound mysterious about it.

The author of the note will know what it is, but it's something that the author can be assured will be addressed.

MR MYERS: Just taking this -- thank you, my Lord. At 00.25, [Dr C] arrived. At 00.36, if we look down, it records:

"Readings: no detectable heart rate, CPR commenced."

Correct?

HARKNESS: Yes.

MYERS: The blood transfusion, if we carry on looking down the page, comes after CPR commenced, it's about 6 or 8 lines below that?

HARKNESS: Yes, which is where it would routinely come within resuscitation.

MYERS: You've explained to the jury and described, and it's a very distressing detail, but as you did CPR on [Baby E], blood was coming from his mouth and his nose, wasn't it?

HARKNESS: Yes.

MYERS: The way you described it in your statement, you can see it if you like at page 1411, page 5 of 7. 1411. It's for the

witness to see and his Lordship. Statements 1411 for the witness and his Lordship and the barristers. Page 5 of 7.

You describe how:

"[Baby E] had deteriorated further and arrested. We managed to get him back for a few minutes before he deteriorated again."

You say:

"At this point [Dr C] was also present and again there was blood pouring out through his mouth and nose while we were doing chest compressions."

Can you see that?

HARKNESS: Yes.

MYERS: Right. [Dr C] is present as that was happening; that's right, isn't it, Dr Harkness?

HARKNESS: Yes.

MYERS: So did the blood transfusion -- it followed the start of CPR, didn't it?

HARKNESS: Yes.

MYERS: So in fact the blood transfusion didn't come along until blood was already being in effect pumped out in the course of CPR, did it?

HARKNESS: No, but if the blood is coming out, despite what we're doing, the blood will keep coming out. You can put as much in as you want, it will keep coming out until you find what's causing it, and unfortunately in cases where there is haemorrhaging, more often than not you cannot stop it.

MYERS: [Baby E] died from acute blood loss, didn't he, from what you can see there?

HARKNESS: There's no PM to confirm or deny that.

MYERS: Oh right. Yes, that's right. But what you saw was a little boy losing massive quantities of blood?

HARKNESS: He lost blood, yes.

MYERS: How long have you been a doctor for, Dr Harkness?

HARKNESS: At that point in time?

MYERS: Well, now.

HARKNESS: Now? 13 years.

MYERS: Right. Well, we've heard that he'd lost about 25% of his volume, possibly, of blood before this point. He's got blood pumping out, as he's having CPR performed upon him. Don't you think that acute gastrointestinal haemorrhage and blood loss in conjunction with that are linked to his death?

HARKNESS: In conjunction -- it doesn't rule out there being another cause and it also doesn't -- the haemorrhage is a result of something. Therefore the cause of death could very well be what has caused the haemorrhage as opposed to the -- it's not as black and white as that.

MYERS: And we don't have a post-mortem, do we?

HARKNESS: No. I'm no expert to comment any further.

MYERS: No. Did you not urge the requirement for a post-mortem, Dr Harkness?

HARKNESS: It wasn't my place.

MYERS: Did you not say, there's been this really strange discolouration, I think we should have a post-mortem?

HARKNESS: I don't think that was my place at the time.

MYERS: Do you agree that if a baby, a little baby, loses the very large quantities of blood that [Baby E] lost that's likely to be fatal?

HARKNESS: We replaced with saline the volume, so we've restored his volume, his circulating volume, so from a point of view of pumping the blood around his body, what will make it fatal is not being able to stop -- not knowing what and where that's coming from.

MYERS: Do you agree if a little baby's lost the blood he had and it's pouring out of his mouth and nose during CPR, that is linked to death?

HARKNESS: It will be linked.

MYERS: Do you agree that you and [Dr C], your reaction to what was diagnosed as a gastrointestinal bleed at 22.10, was far too slow?

HARKNESS: No.

MYERS: Right. Would you admit it if it was?

HARKNESS: Yes.

Re-examination by MR ASTBURY

MR ASTBURY: Two issues arising, please. Firstly, you were asked about seeing [Baby E]'s parents in the unit and you said, "From looking at the notes, I saw mum". Can I just confirm which note you're talking about?

HARKNESS: Sorry, looking at the nursing notes, it mentions --

ASTBURY: Let's go to that, please, at tile 127, Mr Murphy.

I don't think we need to go behind it because we've seen how small the text is. Will you confirm that that's the entry that you were relying on when you said the notes say I saw --

HARKNESS: Yes.

ASTBURY: All right. As a matter of interest, your note at 10.10 doesn't suggest that you updated parents. Is that the type of thing you'd normally put on your note if it had happened?

HARKNESS: Sometimes, yes. It depends on the depth of the conversation.

ASTBURY: Okay. The second issue was this. You were asked about the level of detail in your witness statement about the discolouration that you saw in [Baby E]'s case and your linking it to, potentially, another baby that you'd seen on a previous occasion.

HARKNESS: Yes.

ASTBURY: We've already heard that your witness statement is compiled from an interview, so a recorded interview, which is perhaps, on one view, much more detailed than the witness statement --

HARKNESS: Yes.

ASTBURY: -- and the statement then being obtained from that recording.

HARKNESS: Yes.

ASTBURY: So bearing in mind what the witness statement says, I wonder if we could go, please, to your recording.

It's K3432. Just for the witness, please. 3432.

MR JUSTICE GOSS: Whilst that's being done, just in relation to the making of the witness statement, was the process that you were interviewed by a police officer or officers?

HARKNESS: Yes.

MR JUSTICE GOSS: That was audio recorded?

HARKNESS: Yes.

MR JUSTICE GOSS: Then someone prepared a statement from what you said during the course of that interview?

HARKNESS: Yes.

MR JUSTICE GOSS: Who prepared that statement?

HARKNESS: It came to me from the police.

MR JUSTICE GOSS: So someone listened to the recording and prepared the statement on your behalf?

HARKNESS: Yes.

MR JUSTICE GOSS: What we're going to hear now is what you actually said.

HARKNESS: Thank you.

MR ASTBURY: On this occasion, my Lord, I can confirm this was 24 September 2018.

Hopefully, the relevant passage is in front of you.

You can follow me, Dr Harkness, as we go through it.

The officer asks -- and this may take a minute or two because it's quite a long description:

"You've also referred to [Baby A]. Would you say -- obviously your medical experience -- is that the same rash that you'd seen on [Baby A]?"

That was the question you were asked. You reply:

"Yes. They were very, very similar.

"Question: Would you describe it, would you say, as a rash? Is it similar to meningitis or...?"

"Answer: It's not really a rash as such, it's -- we kind of what you call -- it is perfusion, really, so..."

And I think you explained perfusion to us earlier in your evidence before the short break.

The officer says "okay".

You say:

"So where -- if -- if what you tend to find is that as your colour changes if you've got poor blood, so say if you're cold, for instance, your fingers will go a bit blue or purple and --"

The officer says "yes".

"Answer: You'll notice elderly people with poor circulation, again their toes will be a bit purply colour, kind of bluish tinge as opposed to nice bright pink, but you tend to expect that to be the arms and legs and the whole body to go purple."

Officer:

"Was it purely the abdomen area?"

You reply:

"So from what I [can] remember --"

MR JUSTICE GOSS: "From what I remember". You said "I can remember". It's a small difference, but you should read what is transcribed.

MR ASTBURY: "So from what I remember, it was his abdomen and his chest and -- but it wasn't solid purple, so there was purple patches --"

"Question: Yeah.

"Answer: -- as well as kind of pale patches.

"Question: Yeah.

"Answer: -- as well. So whereas you'd expect the whole body to go purple or pale --"

"Question: Yeah, yeah.

"Answer: -- again, they kind of go purple, and if the blood supply is really poor they go white.

"Question: Right.

"Answer: But it tends to be, again, your arms and legs will go, the first things, and then, depending on how severe it goes, it then affects the body, but it doesn't tend to be a patch, you know, a patch up on the chest over here, a small patch around the side of the abdomen, a patch round the other side."

The officer says "yeah", and you say:

"Answer: And to suddenly come on --

"Question: Yeah.

"Answer: -- out of nowhere. It tends -- again, you would expect there to be a dusky colour change and [then] they start to go a bit of a dusky colour."

MR JUSTICE GOSS: No, it's not "and then". "And they start to go..."

MR ASTBURY: Sorry.

"And they start to go a bit of a dusky colour if their oxygenation --

"Question: Yeah. Mm.

"Answer: -- and again it came so quickly.

"Question: Yeah.

"Answer: Not reflected by the monitors or anything like that as well."

The officer asks again:

"Question: Is it something that you would -- when you -- like similar to meningitis?"

"Answer: Yes.

"Question: Is it something that would disappear to the touch or is it constant, is that constant?

"Answer: Yeah, it would, it would disappear to the touch.

"Question: Right.

"Answer: Potentially, apart from the fact that at this point his blood supply is so bad that you wouldn't -- it's not the kind of thing you press it and it'll quickly come back. What you tend to find with perfusion problems is that if you touch it, it'll then just tend to go pale."

A little further down you say:

"Answer: It was just this purple, purple and pale patches.

"Question: And at that time [asked the officer] did you recognise that to be symptomatic of other babies?

"Answer: No. I think I'd seen it and, again, when, you know, it's this pattern.

"Question: Yeah.

"Answer: And again, I mean, I was quite relatively, you know, a couple of years [this is you] although I'd worked with neonates before as an SHO. All of my kind of registrar training when it came to neonates was there and I kind of thought, this looks strange."

So that is the bulk of what you say about the discolouration in your interview.

I'm not going to read any more, my Lord. Thank you.

That concludes my questions. Does my Lord have any questions.

MR JUSTICE GOSS: No, I don't. Thank you very much, Dr Harkness. You are coming back, I think, to give evidence.

HARKNESS: Tuesday, I believe.

MR JUSTICE GOSS: Tuesday you've been scheduled for, right.

So please do not speak to anyone about this case or anything to do with it, your evidence or any aspect of it, and don't look at any news feeds.

HARKNESS: No, I don't.

MR JUSTICE GOSS: I expect you have enough to do without looking at news feeds. Back on Tuesday then. Thank you very much.

There we are, members of the jury. 2.28.

10.30 tomorrow, please. A fullish day?

MR JOHNSON: Yes. We have Dr Bohin, Dr Evans, the interview summary and one or two corrections. We'll probably fill the day, I think.

MR JUSTICE GOSS: All right. Let's hope so. Thank you very much. See you tomorrow at 10.30, please.

(In the absence of the jury)

MR JUSTICE GOSS: Mr Myers, I didn't ask you this in the presence of the jury, but just for my benefit, is it the defence case that there was no discolouration of the kind described in its various forms by the witnesses of [Baby E] or not?

MR MYERS: No, it's the -- what we say is the adding of details from the point at which they're first observed and then the merging of them into a composite that suggests there is one kind of discolouration that identified an air embolus and applies across the various witnesses, to which we take exception. We haven't challenged, for instance, that there was a purple discolouration.

MR JUSTICE GOSS: Well, exactly. That's why I didn't want to sort of jump in and create a problem by doing that.

So a positive case is not going to be put forward that there was no such discolouration?

MR MYERS: No, there's not. It's the way in which the accounts develop over time, we say.

MR JUSTICE GOSS: I understand that.

MR MYERS: And the way in which it's being said there is a discolouration that's somehow characteristic. That is the point to which we take exception.

MR JUSTICE GOSS: That's all right, because obviously on the evidence in the case of [Baby E], Ms Letby was present throughout all this, so had the opportunity to see it because she was involved in it all.

MR MYERS: And your Lordship will see what she says about that in fact. We'll see there's no issue taken to a discolouration, it's the way it's being dealt with.

MR JUSTICE GOSS: Exactly. I understand that. Thank you.

(2.31 pm)

(The court adjourned until 10.30 am on Friday, 18 November 2022)