

21 October 2022 (Day 13)
Babies A & B

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Friday, 21 October 2022
(10.30 am)

(Delay in proceedings)
(10.37 am)

(In the absence of the jury)

Housekeeping

MR JUSTICE GOSS: Yes, Mr Myers, Mr Johnson. Mr Myers?

MR MYERS: I'm grateful to your Lordship for coming into court. Your Lordship knows that two of the witnesses to give evidence today are two of the prosecution expert witnesses, Dr Owen Arthurs, who's a paediatric radiologist, and Professor Sally Kinsey, who is a haematologist.

Professor Kinsey deals with several issues in her reports, a good deal of which is not in issue. In particular she deals with questions to do with antiphospholipid syndrome and blood clotting. We don't anticipate that is controversial. In the reports she has provided she provides opinion on the accounts of discolouration that have been given and the potential applicability of them to air embolus. That is a matter to be considered with her, but that is the smaller part of her reports.

I'm grateful to my learned friend, Mr Johnson, who's indicated the approach to her evidence and it's apparent there is a matter that she will make reference to, which is a novel matter. She hasn't dealt with it in her reports and it's to do with the mechanism behind discolouration, that area.

Inevitably, we understand, when experts discuss the case with counsel, matters may arise and that's bound to happen in a case like this where there's a multiplicity of issues and, as the case proceeds, some will come into sharper focus than others.

But given this is novel and we don't know precisely where it will take us -- and I'm grateful to my learned friend for explaining this now so we're not into the evidence before we discover it -- we would be grateful if we had sufficient time to hear what Professor Kinsey says and Mr Johnson and I, in the first instance, have considered we can do that together if necessary. We have Dr Hall at court with us. At least then we know what the evidence involves. We also know whether it does create any issue that we need to deal with before she's called to give that particular piece of evidence or her evidence more generally. It may not create an issue, but until we know what she says, we don't know.

So that's why there is the delay and that's why I asked for your Lordship to come into court, if you would, and we would be grateful for the time to do that. Initially we had asked for 10 minutes but I can see it might take longer than 10 minutes and perhaps half an hour we could take, if that doesn't seem unrealistic.

If there is a problem we would let the court know straightaway, but we do need time to hear carefully what Professor Kinsey says before she says it in evidence.

MR JUSTICE GOSS: Yes. Mr Johnson, any observations?

MR JOHNSON: No. I could give you further explanation, but I don't think --

MR JUSTICE GOSS: I don't think we need to spend time doing that. We're in this situation and there would have to be a break even if the witness gave her evidence-in-chief and then Mr Myers would ask for a break at that point. So let's do it now then. You may have certainly until 11.15.

MR MYERS: Thank you. I make it plain: we don't say this in any sense of critical hostility because this is inevitable and to be avoided if at all possible.

MR JUSTICE GOSS: Exactly. This sort of thing will crop up.

I am just looking at the usher now about the situation so far as the jury is concerned. If they're not going to be required until at least 11.15, would you please pass a message to them saying, for reasons that they needn't concerns themselves with, regrettably we can't start until 11.15. It's no one's fault and they needn't speculate about it, but we hope to be able to start at 11.15. Thank you very much indeed.

As far as the defendant's situation is concerned, I think half an hour means -- well, I'll leave it to you what you're to do. All right? I'll say that we will not sit before 11.15. If it is not going to be at 11.15, you will be notified before 11.15 if it's not going to be 11.15. I'll make sure that you are communicated with. Thank you very much indeed.

(10.42 am)

(A short break)

(11.29 am)

MR MYERS: (Inaudible: no audio feed from court) -- skin colour. It is potentially significant and unexpected from this witness and so, having discussed the matter with my learned friend, we've asked that she not be called today, but that a statement be taken from her dealing with it, setting out the basis for that which we don't have, and then we can consider that, which we can do in the time we would have available before she would return to give evidence in any event. And so subject to that -- and so we're on notice with what she says, with the detail for it, when she does come. And we are ready to proceed with other witnesses today.

MR JUSTICE GOSS: Thank you very much. Right. So Dr Arthurs, is it, first?

MR JOHNSON: Yes.

MR JUSTICE GOSS: I do now have the statement from Caroline Bennion in support of the special measures direction application but I'll deal with that when we've completed the evidence of Dr Arthurs.

(In the presence of the jury)

MR JUSTICE GOSS: I apologise, members of the jury, for the fact that you're an hour late coming into court. There were good reasons that we couldn't proceed at 10.30, not the fault of anyone, just a combination of circumstances. We're now going to

proceed with the evidence and Mr Johnson is going to call the next witness.

MR JOHNSON: Thank you, my Lord. Owen Arthurs, please.

DR OWEN ARTHURS (sworn)

Examination-in-chief by MR JOHNSON

MR JOHNSON: Would you start by identifying yourself, please?

ARTHURS: I'm Owen John Arthurs.

JOHNSON: And your profession, please?

ARTHURS: I'm a consultant paediatric radiologist at Great Ormond Street Hospital in London.

JOHNSON: A paediatric radiologist. What does a paediatric radiologist do, please?

ARTHURS: A radiologist is a specialist in images and image interpretation and my special interest is in doing that in children.

JOHNSON: Thank you. And your qualifications, please?

ARTHURS: I'm a fellow of the Royal College of Radiologists, I'm a fellow of the Royal College of Paediatrics and Child Health, and I hold a PhD in imaging, and I am now professor of radiology at Great Ormond Street Hospital.

JOHNSON: Thank you. You have reviewed many of the children in this case, haven't you?

ARTHURS: I have.

JOHNSON: The two that I'm going to ask you about today are [Baby A] and [Baby B]. And you have written several reports on each; is that right?

ARTHURS: Yes, I have.

JOHNSON: Just as a little bit of background, can we start with [Baby A] first. I think you were given information about [Baby A]'s birth, his weight at birth, his gestation at birth and also details of when he died?

ARTHURS: Yes, that's right.

JOHNSON: And I won't ask you to repeat those because the jury has already heard that information. But what in general terms were you invited or instructed to do?

ARTHURS: So I was to review the imaging of [Baby A]. He had several X-rays taken when he was alive. He also had several X-rays taken after he died, which were done in Alder Hey.

JOHNSON: And Alder Hey is the children's hospital in Liverpool, isn't it?

ARTHURS: That's right.

JOHNSON: Thank you. From time to time some of the witnesses in this case use the phrase "radiograph"; is that the same as an X-ray or is it different?

ARTHURS: Technically, the X-ray is the beam that passes through the body to produce the image, so the image is technically a radiograph, but the popular term for the images has become "X-ray images", so use of the term X-rays is fine.

JOHNSON: Thank you. Can we deal first, if we may, with material other than the images that you've seen. Were you sent reports from other medical practitioners?

ARTHURS: Yes, I have, and I think I've detailed those in my reports.

JOHNSON: Yes. They included, I think, three reports from Dr Dewi Evans?

ARTHURS: Yes.

JOHNSON: And a report from Dr Andreas Marnerides?

ARTHURS: Yes, that's right.

JOHNSON: Dealing with the in-life X-rays first then if we may, if we could just put these on the screen to remind the jury. They are tiles 31, 128 -- I'm not going to go to these individually -- thank you. This is just for the jury's benefit if they want the information at the moment. 128 is the next tile. 142. And finally, 156.

Can we just go to that image, please, the one at 156?

Dr Arthurs, is it right to say that, broadly speaking, those four images are similar?

ARTHURS: Yes, that's right.

JOHNSON: And they're all slightly different because they're taken at different times of a child from not in exactly the same position. Is there anything unusual about any of the four images?

ARTHURS: In [Baby A], no, there's nothing particularly remarkable about the images that we have in terms of his heart and lungs. I think the only comment that I made was about the umbilical catheter that was in slightly the wrong place.

JOHNSON: Yes. We've heard some of the treating doctors talk about that. So nothing remarkable about those images. Just so that the jury have this as a reference -- and this is the first time we've actually looked at any of the X-rays, really -- we can see at the bottom right-hand edge of the picture, there is a date and timestamp. Is that stamped by the machine?

ARTHURS: It's either stamped by the machine or by the radiographer when they acquire the X-ray, so it's a date of acquisition to document exactly when it was done.

JOHNSON: Yes, and in this context does acquisition mean taking the picture?

ARTHURS: Yes, that's right, apologies.

JOHNSON: Top left-hand corner, name, sex, presumably an individualised identification number for the child concerned?

ARTHURS: Hospital number, so that will be Countess of Chester, and then a six, seven or eight-digit number.

JOHNSON: Is there any significance in any of the other --

ARTHURS: No, they show the parameters that have been used by the machine to take the image.

JOHNSON: Right. When you -- well, you were also shown or given seven images of [Baby A] that had been taken after his death?

ARTHURS: That's right, yes.

JOHNSON: Those images were taken, as you've told us, as Alder Hey?

ARTHURS: Yes.

JOHNSON: And taken on 11 June?

ARTHURS: I think they were taken on the 10th, actually.

JOHNSON: I beg your pardon.

ARTHURS: There's an error in some of the documentation, but yes, that's right.

JOHNSON: I'd just like to show you one of those images, please. Just to orientate -- well, could you orientate us, please, as to what we're seeing here?

ARTHURS: Do the jury have the image that I can see here --

JOHNSON: Yes.

ARTHURS: -- in the quality that I can see it? Because I think the quality of what's been projected is not as good. Can you all see it on the screens in front of you?

This is image taken laterally through the baby with the baby lying down. The head is on the left-hand side of the image and the pelvis -- you can see the two femurs on the right-hand side of the image as you are looking at it. The bones of the spine are shown all the way in sequence along the bottom. And in fact, just beneath the skull, you can see some of the tubes and those are the things that were still in place. So there's an endotracheal tube, for example, crossing the neck.

JOHNSON: Is that at the top of the neck?

ARTHURS: The top, yes. There are two lines and there's a nasogastric tube as well just below that.

So X-rays show bones as white because they prevent the X-rays from going through them and they show gas and air, for example, as black.

JOHNSON: Just for the purposes of general education, really, because these issues become relevant at a later stage although they're not relevant to this particular case. What can we see just to the left of where the femurs start, that sort of dark area there?

ARTHURS: If you move your cursor up, this is gas within the bowel, a normal feature of post-mortem radiographs. The block of gas that is the black area which is to the left of that, further up in the body, is gas within the heart.

JOHNSON: Yes. Below the heart that we can see there, is that the nasogastric tube which is running --

ARTHURS: That's right, that's the white tube that ends just there (indicating). So that would be presumably in the stomach.

JOHNSON: Yes. Is there anything that's unusual about this radiograph --

ARTHURS: Yes. The comment I made about this radiograph is that you can also see, as well as all the normal expected gas that you would see in a baby in a post-mortem state, you can also see a line of gas just in front of the spine. So that runs almost from there (indicating) almost all the way up to there (indicating), that's right.

JOHNSON: Okay. Would you normally expect to see that?

ARTHURS: No. That's an unusual finding.

JOHNSON: So far as how it comes to be there, what are the possibilities from your perspective?

ARTHURS: So that finding is so unusual that I reviewed several of my existing cases in the series of radiographs that we have at Great Ormond Street to try and identify in what circumstances that might occur. In my report I've gone in length into the possible circumstances in which we often see that type of gas.

So firstly, it's quite unusual. So in several hundred radiographs of babies who have died of natural causes, we don't see gas in that location.

JOHNSON: Right. Let's just take this slowly, if we may, please. A death from natural causes, you just don't see that?

ARTHURS: We don't see that. That's right.

JOHNSON: And so far as unnatural causes are concerned, what are the possibilities?

ARTHURS: So if there's been a severe fracture somewhere in the body then gas could be introduced and then circulated and it could be seen there.

JOHNSON: Right. Now, this is your day-to-day experience, we're all novices. How does a fracture introduce air into the body in a position like this?

ARTHURS: I don't mean a fracture of a bone, a simple bone, something like that. Something like a road traffic accident, if you were to have a fracture through your skull base, it might also break the blood vessels and then air can track into the

blood vessels. So what I'm talking about is severe road traffic accidents, those kind of things.

JOHNSON: Okay. So we know this child was in hospital from birth to death, so we can exclude road traffic accidents?

ARTHURS: Yes.

JOHNSON: What's the next possibility?

ARTHURS: The other circumstance in which we've seen it has been overwhelming infection, sepsis.

JOHNSON: Yes. Sepsis is a term that most jurors will have heard. It may be that some of them, like me, don't really understand what it means. What is sepsis?

ARTHURS: Sepsis is essentially overwhelming infection in most of the organs of the body.

JOHNSON: If it was a case of sepsis, would you see evidence on the radiograph, on the X-ray, of problems with the organs as well?

ARTHURS: So, no, not always because, as you can see, what we mainly see on X-rays are bones and gas, and we can't distinguish very much else of the other soft tissues.

JOHNSON: Okay. So in order to determine whether or not sepsis was a possibility in this case, what would the jury have to look at in terms of other evidence in the case?

ARTHURS: This baby died, so there would have been an autopsy, and there would be clear identifiers from a pathology point of view as to whether or not the baby had overwhelming infection.

JOHNSON: Right. On the basis that we exclude that as a possibility, what's the next possibility?

ARTHURS: We have seen it occasionally, and very occasionally, in babies who have died outside of hospital. So the term for unexplained death outside of hospital in infancy is S-U-D-I, SUDI, or sudden unexplained death in infancy.

JOHNSON: Why do you put the restriction on babies who die outside hospital rather than including those who die in hospital in this context?

ARTHURS: SUDI is effectively a diagnosis of exclusion when all other things have been excluded in an otherwise well baby who wasn't being treated for anything, who went home, was feeding

normally, et cetera, et cetera, and then unexpectedly collapsed at home. It is a recognised phenomenon that occurs in babies in the age of about 3 to 9 months. Again, a pathologist would be able to tell you much more about SUDI as a concept than I will.

JOHNSON: But this case plainly, for the reasons you've given us, doesn't fall into that category?

ARTHURS: That's right.

JOHNSON: So what is the next possibility, please, Dr Arthurs?

ARTHURS: We have seen it in some children who have undergone extensive resuscitation. I am just referring to my report, where we didn't see this very commonly on radiographs in that circumstance, but we are now performing CT scans, which are more detailed scans, of babies who have had died, which allows us to see smaller locules of gas and smaller and smaller -- better imaging, effectively.

JOHNSON: So a CT scan is more discriminating?

ARTHURS: Yes.

JOHNSON: Okay. Sorry, I interrupted you.

ARTHURS: No, no. In that sense we have seen it occasionally following resuscitation and the premise is that -- we hypothesise that there is some natural gas in the body after death and it is possible therefore the resuscitation could circulate it around if it were successful in moving blood around with gas in it.

JOHNSON: Are there any other possibilities as to how this gas got there?

ARTHURS: So if you end at that point, effectively this is unexplained.

JOHNSON: Yes.

ARTHURS: We do know that the baby had an umbilical venous catheter in situ and we do know that gas can be introduced into vessels through catheters and devices that medical people have put there.

JOHNSON: Yes.

ARTHURS: So through cannulas, through long lines, through umbilical catheters, you can introduce gas.

JOHNSON: We know as a matter of evidence that there was also a long line in this child.

ARTHURS: Yes.

JOHNSON: It had been removed by the time these images were taken.

ARTHURS: Yes. The umbilical venous catheter actually is still in.

JOHNSON: Yes, but the long line had been removed?

ARTHURS: Yes.

JOHNSON: Can gas -- is it possible that the gas was introduced via one or other of those lines?

ARTHURS: Yes, it's possible.

JOHNSON: Is the appearance of the gas that we see in the image on the screen consistent with that as a method of introduction?

ARTHURS: Yes. So the sensible, most pragmatic conclusion to bring would be that in the absence of any other explanation, that would be an alternative explanation.

JOHNSON: But lest we read too much into it in isolation, is what we see in the image diagnostic of, ie does it say, yes, that is definitely how this gas was introduced?

ARTHURS: No, it doesn't. All the image shows you is gas in one of the large vessels of the body on a post-mortem radiograph of a small baby.

JOHNSON: Have you ever seen this much gas in a child's body that hasn't been explained?

ARTHURS: Only in one other case, which I think we'll discuss later on.

JOHNSON: This is one of the other children in this case?

ARTHURS: That's right.

JOHNSON: So far as your opinion was concerned relating to this radiological finding in the body of [Baby A], what was your final opinion, please, doctor?

ARTHURS: So my opinion was that this was an unusual appearance. This is not typical of any of the radiographs we normally see in

this circumstance, and in the absence of any other explanation, this appearance is consistent with but not diagnostic of air being administered.

JOHNSON: What some might call an air embolus?

ARTHURS: Yes. I'm not sure I would say this is evidence of an air embolus, but I think this would be consistent with air having been administered.

JOHNSON: Yes. All right. Just so that the jury understand why my use of language is incorrect, could you explain why air embolus isn't the correct label to put on what you can see in the image?

ARTHURS: To me an air embolus is effectively a cause of death, so sufficient air having been entered into the body and which kills the patient. I am not sure you can say that that's what's happened from this image.

JOHNSON: And you're looking at it from your --

ARTHURS: Purely from a radiological perspective.

JOHNSON: So you're not taking into account any of the other evidence at all in the case?

ARTHURS: That's right.

JOHNSON: You're looking at the image and saying what you can see with your expertise from that image?

ARTHURS: Yes.

JOHNSON: Thank you. Can we turn to the case of [Baby B], please, [Baby A]'s sister?

Again, Dr Arthurs, were you approached to consider the evidence in the case of [Baby B]?

ARTHURS: Yes, that's right, I was.

JOHNSON: And did you review a number of images in her case?

ARTHURS: I did.

JOHNSON: Were they dated -- I'm not going to run through them as I did with the other case. Were they dated the 8th and 10 June?

ARTHURS: 2015, that's right.

JOHNSON: Thank you. And taken at various times on those dates. Is there anything that you saw in any of the images of [Baby B] that were unusual?

ARTHURS: No. In my report I've gone through six radiographs.

[Baby B] was 31 weeks, so premature. [Baby B] shows some changes in lungs, which are that of premature lung disease, which would be expected, and there are no real other abnormalities to comment upon from a radiological perspective.

JOHNSON: Does the lack of abnormalities from a radiological perspective inform the issue of whether or not anyone injected air into [Baby B]?

ARTHURS: I think we need to consider that separately to [Baby B]'s images.

JOHNSON: Yes.

ARTHURS: So if we consider an air embolus as a concept, in my experience we very rarely see air embolus as a cause of death or as a radiological diagnosis.

JOHNSON: Why is that?

ARTHURS: There are several reasons. One is that very, very small amounts of air probably enter the body quite often when we give injections or those sort of things. We never take images of those, they never cause any problems, they disappear on their own and they -- so clinically, the baby and the child is asymptomatic.

JOHNSON: Yes.

ARTHURS: An air embolus to the point where it causes clinical symptoms is usually so massive that the last thing someone is rushing to do is to do an X-ray. So they would be so busy trying to resuscitate the child at all costs that very rarely is there an X-ray at the same time to demonstrate that that was what happened.

JOHNSON: So in the context of the jury having the issue to decide as to whether or not there was an air embolus in [Baby B]'s case, does the image help either for or against that as a proposition?

ARTHURS: No. It doesn't help for or against. So the absence of air doesn't mean that that didn't happen and then the air has disappeared. The presence of air would help obviously make

that -- but you can understand why that very rarely, rarely occurs.

MR JOHNSON: Would you remain there, please, Dr Arthurs? It may be that there are some further questions for you.

Cross-examination by MR MYERS

MR MYERS: I just have some general questions to ask you about air in the body and your analysis of that, Dr Arthurs.

ARTHURS: Yes.

MYERS: And then I'll look at the two cases that we've looked at here, but there may not be a great deal extra that I need to ask you about them. Just to confirm some general points, radiographic evidence of air embolus is rare, isn't it?

ARTHURS: Yes.

MYERS: What you're able to tell us is that where you do encounter air in the system, particularly I am talking about in images taken during life, that is caused by medical procedures or the placement of lines into the patient's body?

ARTHURS: Yes. That's usually the scenario.

MYERS: And indeed, on post-mortem imaging, that's another regular explanation for how it is that air could be present?

ARTHURS: Could you rephrase that?

MYERS: Well, on post-mortem imaging, the presence of air may also be the result of medical procedures or placement?

ARTHURS: Yes, that's reasonable.

MYERS: I'll leave the question of how often out of it for the time being.

ARTHURS: Okay.

MYERS: We may hear more about this later, but just so the jury can keep up with where we are in talking about this, Dr Arthurs, when we talk about air entering the body because of the placement of vascular lines, that refers to the potential for something like a UVC, that we've heard about, or a long line being open to the air for long enough for air to pass through that and into the patient's body?

ARTHURS: Yes.

MYERS: And that's something that can happen in practice?

ARTHURS: Yes. That's right.

MYERS: Would you agree that it is rare to identify air embolus from radiographic imaging?

ARTHURS: Yes.

MYERS: I'm going to ask you a few questions about air in the body in life and then about the post-mortem situation.

If we want to be able to identify and accurately diagnose air embolism in images in life, you would require imaging that showed the presence of air in blood vessels where there is no other explanation for the air being there?

ARTHURS: Um... You...

MYERS: Apart from -- no other explanation apart from being introduced externally.

ARTHURS: Yes. I think that you would -- in order to... So in order to see air on images in life, you would seek an explanation as to how they got there, one of which could be that they had entered the body through medical administration. Is that the question you were asking?

MYERS: Well, what I'm asking really is this, that the gold standard of identifying air embolus would be, first of all, an image showing the presence of air in the body in life?

ARTHURS: So that I disagree with. That isn't the gold standard. As we have said --

MYERS: What is the gold standard, let me ask?

ARTHURS: It would be a clinical diagnosis as the most likely cause or potentially it would be identifiable at post-mortem. I think the assumption that an image is needed to prove that air embolus occurred is wrong for precisely the reasons that we've given.

MYERS: Because you have to look at it in the context of the history and all clinical findings?

ARTHURS: Yes.

MYERS: That's what I was going to ask. So what you have to do is look at the imaging and then you or you and others will look at the imaging together with the surrounding circumstances?

ARTHURS: Yes, that's right.

MYERS: So far as imaging post-mortem, so after death, is concerned, you've explained to us that doing the research or the studies you've done, you wouldn't normally expect to find gas in the vessel or the vessels that we see on the image we've looked at?

ARTHURS: That's right.

MYERS: Right. Would you say that in general, the significance of gas in the large vessels on post-mortem radiographs is not known?

ARTHURS: I would say that when we see it, we usually have an explanation for it in the examples that I have given already.

MYERS: Post-mortem gas in the body is a natural phenomenon, isn't it?

ARTHURS: Yes, that's correct.

MYERS: So you may well expect to find, in your work, gas in various parts of the body after death?

ARTHURS: Yes.

MYERS: And the build-up of gas after death can commence quite quickly, can't it?

ARTHURS: Yes.

MYERS: (Overspeaking) to start?

ARTHURS: I don't think anybody knows how quickly but, yes, it can and seeing gas on images in normal vessels on post-mortem radiographs is common, yes.

MYERS: Is it the case that the more time passes, the greater the quantity of air -- the greater the quantity of gas?

ARTHURS: I think that's logical but I'm not sure that's necessarily proven.

MYERS: When you give us the conclusion or the opinion that the gas in the vessels is an unusual finding, where you've said

that, is that something that's based on your own research from your own cases in your clinical work?

ARTHURS: Yes, and it's based on published literature that that's not a common phenomenon, yes.

MYERS: In your reports you set out in some detail why it is that you say that, don't you?

ARTHURS: Yes.

MYERS: Can I just explore that with you so we understand what you mean by that.

ARTHURS: Yes, of course.

MYERS: The review of cases that you have undertaken took you to a conclusion that you might expect to find that gas in 25% or fewer cases; is that correct?

ARTHURS: My Lord, perhaps I should explain the reason why I went and did that review of the cases that I set out in my report.

MYERS: I'm going to -- with his Lordship's leave I am going to take you through that, but I leave it to you to answer it how you wish.

MR JUSTICE GOSS: Right.

ARTHURS: So when first we saw the gas in those locations, for me to be able to say that it is unusual, I had to go back and review cases because we know that gas is common in the heart, in some of the other locations, so I posed it to myself: perhaps we actually do see this commonly and we haven't appreciated it previously. So the reason to go back and investigate all of the children that we have is to see whether I could actually make the statement "this is unusual" with any degree of confidence. And there are three studies that I went through, one of which is published, based on CT, of children who have died and then more extensively going back through several babies who have died in our unit in a teaching case that we have and the conclusion from that is that it is indeed unusual.

MR MYERS: And you give a figure in your report -- I'm looking at page 499, so this is the report dated 19 May 2020, it's page 8 of that report -- at page 10 of that report.

ARTHURS: Yes. So the figures I came up with in looking back through different groups was that approximately a quarter of the babies that we looked at had gas in the large vessels.

MYERS: Right. So when you say you give us the figure that -- it's an unusual finding to find gas there in terms of your research, that translates to 25% of the cases which you have gone through, that's what you found?

ARTHURS: That's right.

MYERS: Right. I'm not going to question you about whether 25% is unusual or not, but that's the way you characterise 25%?

ARTHURS: 25% of the children that we came across, the majority of whom had an explanation.

MYERS: As to how you get to that, I just want to ask this. You'll be familiar, Dr Arthurs, with evidence-based medicine, won't you, that approach?

ARTHURS: Yes, that's right.

MYERS: For those of us who aren't so familiar, that means basing an opinion on sound research; that's right, isn't it?

ARTHURS: Yes.

MYERS: Recognising deficiencies in it and recognising where we simply don't know?

ARTHURS: That's right.

MYERS: When we come to look at the cases upon which you base your conclusion, there's a published paper you looked at, written by Barber and others, isn't there?

ARTHURS: That's a paper on which I was a senior author, yes.

MYERS: In that case, and I'm going to go through this so we can follow why we get to you saying unusual, in that case -- and you refer to this at page 10 of your report -- you found 60% of the children had gas in some location of their body after death.

ARTHURS: Yes, that's right.

MYERS: So that's where you started on the report you worked on. But when you looked at that, you saw that dealt with children whose average age was 2 years, didn't you?

ARTHURS: Yes. These are older children and that study used CT.

MYERS: So you then turned from that work to records at your own hospital, didn't you?

ARTHURS: That's right.

MYERS: If we're going to have research and an evaluation of how often something comes before you in your work, the best research will be designed specifically to investigate an issue, won't it, it's prospective?

ARTHURS: Yes.

MYERS: So it will define what it's looking into, won't it?

ARTHURS: Are you arguing that we should have done a study --

MYERS: I just want to go through what you did do.

ARTHURS: Okay.

MYERS: It will control variables, things that can change?

ARTHURS: Yes.

MYERS: It will be conducted objectively, by which I mean, for example, the person reviewing the X-rays in that research may be masked from other clinical information?

ARTHURS: Yes.

MYERS: When you came to do your research, you had already -- I'm not being critical of you for this, it's inevitable, but you'd already been provided with an outline of what the investigation was about, hadn't you?

ARTHURS: For the purposes of this I'd been provided with a hypothesis.

MYERS: A hypothesis, yes. If you're engaging in specific research you would try to have as wide a pool of subjects to base your research on as possible?

ARTHURS: Yes, which are representative of the question in hand.

MYERS: And then the research would be what's called peer reviewed?

ARTHURS: Yes.

MYERS: Which means that other specialists can look at it critically and assess it?

ARTHURS: Yes.

MYERS: In coming to the finding that this is unusual, and the figure of 25%, what you did was to begin by narrowing down 500 cases that you had at Great Ormond Street, didn't you?

ARTHURS: Yes.

MYERS: Of those 500, a very large number of them were foetuses or stillborn, weren't they?

ARTHURS: Yes. That's correct.

MYERS: I just pause there to say, the hospital where you work is Great Ormond Street, isn't it, Dr Arthurs?

ARTHURS: Yes, it is.

MYERS: You then narrowed down from those 500 to children who are under the age of 1 when they died; is that correct?

ARTHURS: Yes, that's right.

MYERS: Just pausing there, I'm going to carry on. Neonates are a specific group of babies, aren't they, as in 1 to 4 weeks as a rule?

ARTHURS: Yes, that's right.

MYERS: And one cannot simply take studies of older babies or children as being indicative of what happens with a neonate in the period of 1 to 4 weeks?

ARTHURS: No, but that wasn't the purpose of what I was doing here.

MYERS: No, you were looking to see the occurrence of gas in those vessels?

ARTHURS: Yes.

MYERS: Yes. Of the 100 who were under the age of 1 when they died, you narrowed that down then to 38 children who were under 2 months of age at the time of death?

ARTHURS: So we're now moving on from the 500 cases where I went through to look at their X-rays --

MYERS: Yes.

ARTHURS: -- and I found six cases in slightly older children where gas was identifiable on the large vessels.

MYERS: Yes.

ARTHURS: And of those, five had had traumatic injuries and the sixth child had died of sepsis. So in fact there was an explanation for the gas in the great vessels on all of those children from my radiographic study or the investigation that I did of their cases that I had. However, I then went into detail into the CT scans that we have on children under the age of 1, and I found 100 cases of those, of which 38 were babies under 2 months of age. So of those I found eight cases where they had gas in the great vessels and they had died of trauma, road traffic accidents, sudden unexpected death in infancy, congenital heart disease, and disseminated malignancy. So we had found no unexplained cases of gas in that location after a detailed review.

MYERS: Your findings though are based, let's get this clear, on the basis of eight out of 38 babies; yes?

ARTHURS: So my findings are based on the case review that we have, which is probably the largest available.

MYERS: The review you did comes down to narrowing it down to 38 babies who were under 2 months, that's where you get to?

ARTHURS: Yes.

MYERS: It can't be said from the information you have that that's representative of babies who are 1, 2 or 3 days old?

ARTHURS: No, it's representative of the typical deaths that we encounter that are referred to Great Ormond Street Hospital.

MYERS: Which itself is a particular class of work, isn't it?

ARTHURS: Yes.

MYERS: It's not necessarily representative of every neonatal unit in the country, is it?

ARTHURS: It's representative of perinatal autopsy in the types of babies who need a cause of death established.

MYERS: But the figures you're giving us, to be clear, are not based upon neonates in the first few days of life who are preterm exclusively, are they?

ARTHURS: The vast majority of those don't die.

MYERS: But the figures we have -- did your study group focus upon neonates 1 to 3 days old or a week old who were preterm?

ARTHURS: I can't tell you exactly from there, but they will have been included in the study if they died at my hospital.

MYERS: You can't tell us though?

ARTHURS: No.

MYERS: You can't tell us how much time, can you, passed from death to imaging in the cases that you're relying upon, can you?

ARTHURS: No, that's right.

MYERS: And you can't tell us, for instance, things like the specific temperatures in which, sadly, the bodies were kept before imaging was taken?

ARTHURS: The 4 degrees is the standard temperature that they're kept in the mortuary refrigerator.

MYERS: And the particular circumstances of death that we are dealing with in this case are not replicated, I'm talking the clinical circumstances, are not replicated in your work, are they?

ARTHURS: How do you mean they're not replicated?

MYERS: You were unable to identify from the children you looked at, Dr Arthurs, any that died in circumstances clinically that are the same or similar to the ones we're dealing with in this case, the circumstances of death?

ARTHURS: No. In the sense that the circumstances of death of these children are quite unusual, it would be reasonable that none of them were represented in the sample that I looked at.

MYERS: The point I'm making, I hope clearly and respectfully, is there are many variables that can apply to a study when research is conducted upon it, aren't there?

ARTHURS: Yes.

MYERS: And what you rely upon in telling us that you wouldn't normally expect to find gas in the vessels post-mortem is in effect, and I don't say this disrespectfully, but an informal review of cases from your own institution, isn't it?

ARTHURS: Yes, it's what you would call an observational study or clinical experience.

MYERS: But it's not a controlled study, is it?

ARTHURS: I'm trying to imagine how you would do a controlled study.

MYERS: Well, I'm not asking you to imagine how. The proper approach would be to have a controlled study, if at all possible, wouldn't it?

ARTHURS: And what would a controlled study look like? What are the variables that we're trying to control in this particular circumstance?

MYERS: I'm not the claiming to be the expert, Dr Arthurs, I am asking you to confirm that this isn't a study with any set controls on it. It's made out of what you could find out of records looking through what you had at Great Ormond Street, isn't it?

ARTHURS: Yes, that's what an observational study is.

MYERS: Again not disrespectfully, but it lacks objectivity and independence in that it is conducted by you looking into a theory that you've been asked to consider?

ARTHURS: No, it lacks objectivity in the sense that it's an observational study of what data was available at the time. I'm trying to understand -- I think your question is directed at this, that an alternative study could have been done and that is why this study is insufficient?

MYERS: No, I'm looking at ways in which this may come below a higher standard of evidence-based medical research.

ARTHURS: Oh, I see.

MYERS: That's why I began by asking that.

ARTHURS: So observational studies and clinical experience are not the highest levels of evidence-based medicine. However, sometimes they are the only evidence that we have on which some conclusions can be drawn.

MYERS: And do you agree that --

MR JUSTICE GOSS: Just let him finish. Are you finished?

ARTHURS: That's what I have tried to provide to the court to try and contextualise how commonly this occurs, some potential explanations for it, and with the deficiencies, as you have kindly pointed out, in doing so, that is the basis on which I can provide my evidence here today.

MR MYERS: So it's quite clear, and it's not meant to be discourteous or difficult in any way, but if we are expected to rely upon what you tell us, I'm anxious that we explain to the jury the circumstances in which you come to that assessment.

ARTHURS: Yes, it's entirely reasonable.

MYERS: Yes. The study that you conducted, based on material from your own institution, has not -- again this isn't to be rude -- been peer-reviewed or validated by anyone beyond what you're telling us now?

ARTHURS: No, that's correct.

MYERS: And it may well be that you have no alternative but to work with the numbers of babies you work with, but we come down to what you find in the case of eight babies out 38, don't we?

ARTHURS: That is my clinical experience.

MYERS: Yes. I'm not being critical of that and I'm not saying it's easy to do, but when we hear the finding that it is not what you'd normally expect or it's unusual, that is what that finding is based upon?

ARTHURS: That's right.

MYERS: And I think the figure which that works out at, as a simple bit of maths, is in 25% of those cases there was gas in the great vessels post-mortem?

ARTHURS: Yes, that's right, the majority of which had an explanation.

MYERS: Yes. Moving on to other ways in which we might find air in the system. We've dealt with air entering the system because of medical procedures or the medical profession. You accept, do you, Dr Arthurs, that air may enter the system as a result of CPR, the resuscitation?

ARTHURS: I don't think air enters the system as a result of --

MYERS: Is liberated within the system as a result --

ARTHURS: -- but can be distributed.

MYERS: It can be distributed. And so if there has been resuscitation that has taken place, independently of the 25% point, that may be what's called a differential diagnosis? That's an alternative explanation for the air that we find.

ARTHURS: Yes, it's an alternative explanation, that's right.

MYERS: Where [Baby A] is concerned, there are a number of potential explanations for the air that we see in the X-ray that we looked at, is that right, Dr Arthurs?

ARTHURS: There are a number of potential explanations, that's right, yes.

MYERS: And subject to all the circumstances, they can be assessed, but the potential explanations that you provide us with is air being introduced from outside, what was called at one point air embolus, if I recall.

ARTHURS: Yes.

MYERS: You make the point, well, air embolus presupposes that someone's -- the way you put it, it presupposes a cause of death, how it was done.

ARTHURS: Yes.

MYERS: From the radiographs, you can't say that; that's right, isn't it?

ARTHURS: Yes, that's right.

MYERS: But you can say one possibility is air coming in from outside?

ARTHURS: Yes.

MYERS: Another possibility is post-mortem changes?

ARTHURS: Yes.

MYERS: Which is what we're looking at with the 25% figure and the research.

ARTHURS: (Witness nods).

MYERS: Another explanation is resuscitation, potentially?

ARTHURS: Yes.

MYERS: What you can say, concluding all of that, is that, therefore, air being present where it was found is consistent with an air embolus, but it isn't diagnostic of it?

ARTHURS: Yes, that's right.

MYERS: And it could be consistent with the other explanations we've looked at as well, depending upon the overall circumstances?

ARTHURS: Yes.

MYERS: In the case of [Baby B], what you identified, Dr Arthurs, from the chest radiographs you saw, suggests in addition to your conclusion you identified radiographs showing "mild lung disease of prematurity and its complications"?

ARTHURS: That's right.

MYERS: The radiograph -- one radiograph you saw is dated 10 June 2015, taken at 01.09?

ARTHURS: Yes, that's right.

MYERS: The jury will know from evidence, and you may or may not know, that the collapse takes place round about 00.30.

ARTHURS: (Witness nods).

MYERS: So that means that radiograph is taken about 40 minutes after the time of collapse?

ARTHURS: Yes.

MYERS: And on that radiograph, there are no radiographic features to support air embolus, are there?

ARTHURS: Yes, that radiograph doesn't show a significant abnormality.

MR MYERS: Thank you, Dr Arthurs.

Re-examination by MR JOHNSON

MR JOHNSON: Just dealing with that last point, Dr Arthurs, the absence of a significant abnormality. What can we read into that either way, given the time frame that's just been explained to you?

ARTHURS: I can only speak to the radiographs, but I don't think you can conclude anything either way.

JOHNSON: No. Thank you.

It may be that I misunderstood the questioning, but it appeared that one of the criticisms of your reviews of other cases was

that in effect you were comparing apples with oranges, putting it in layman's terms. Would it have been possible to do your exercise any other way than how you did it? In other words, look at other cases and try and contextualise them to the facts of this case?

ARTHURS: I think it's very difficult to come up with hypothetical ways in which something can have occurred. What I have tried to do is present what is quite a large body of evidence of how children and babies normally die and the circumstances and what we see on the imaging. So by looking back through all of my cases and showing that this is not a common finding in the absence of another explanation, that's probably the best observational study that we have currently to say that this is an unusual finding.

JOHNSON: Yes. And when you say this is an unusual finding, are you referring to that line of gas that we see --

ARTHURS: That's right, yes.

JOHNSON: -- above the spine of [Baby A] in the radiograph?

ARTHURS: That's right, yes.

MR JOHNSON: Thank you.

Does your Lordship have any questions?

Questions from THE JUDGE

MR JUSTICE GOSS: Just this: you've been asked questions by the advocates who have read your reports and are familiar with the case. The jury haven't seen any of your reports. They don't know precisely the study to which you're referring.

First of all, when did you carry out these observational studies and clinical experience of these other cases?

ARTHURS: So there's a published study in 2015 where we looked at how commonly gas occurs in older children when they die.

MR JUSTICE GOSS: And you looked at -- that's general parameter and how many cases did you consider there?

ARTHURS: 35, I think we found, and we found that 10 had some gas in the large vessels. So that study is published, peer-reviewed, available in the literature.

MR JUSTICE GOSS: Yes.

ARTHURS: Because that study is of children, which actually may not have included babies, you can't directly infer from that study to what might have happened in [Baby A]. Hence the review of some of the work that I've done.

MR JUSTICE GOSS: So your definition of children -- a child in law is someone under 18?

ARTHURS: Yes. So anyone -- so probably 1 to 16 were probably included in that study.

MR JUSTICE GOSS: Right. How many were of babies who were 1 or 2 days old?

ARTHURS: I can't tell you off the top of my head, but very few probably in that study.

MR JUSTICE GOSS: And were premature?

ARTHURS: Probably none.

MR JUSTICE GOSS: Probably none?

ARTHURS: Probably none in that study.

MR JUSTICE GOSS: Is there any reason for there being so few?

ARTHURS: That study was independent of the question here.

MR JUSTICE GOSS: Yes.

ARTHURS: So that study was performed in order to say: when we see gas on CT in children, does it mean anything, is it related to something that they've had, is it something we can infer something from? And the conclusion of it was that we saw it after traumatic deaths and we think that resuscitation might move some of the gas around the body. That's all we can say from that study. I didn't want to present that study and then draw inferences to the cases we have in front of us today without having made some reference to the types of children that I see on a day-to-day basis.

MR JUSTICE GOSS: And the children, they can be from neonates --

ARTHURS: They can.

MR JUSTICE GOSS: -- up to teenage years?

ARTHURS: Absolutely. Which is why I've then gone forward to try and specifically look at children who have been born and subsequently died within the first few months of life, so

typically under 1, for the purposes of trying to get sufficient number of children to try and say something about. And that's where some of the numbers in my report come from.

So in 500 babies under 1, who, if you take out all of those who were born and never breathed, for example, quite a lot of fetuses and stillbirths, we can find 46 children who had been born and subsequently died in the first few months of life and, of those, we found that six had gas in those locations, all of whom had had trauma to the body, head injuries, road traffic accidents, allowing gas to enter the body through fractures, and the sixth child had died of an overwhelming infection in sepsis. So I'm trying to contextualise from my clinical experience how common it is to see gas in this exact location on a post-mortem radiograph in a child without any history. And the conclusion I've drawn is it's unusual.

MR JUSTICE GOSS: Thank you.

Do you want to ask any questions arising out of that, Mr Myers?

MR MYERS: Nothing from that, my Lord.

MR JUSTICE GOSS: I have gone back over ground but I wanted to make sure it was clear to the jury what Professor Arthurs was saying, because obviously this is your bread and butter, your daily work.

ARTHURS: Yes.

MR JUSTICE GOSS: Right. Anything you want to ask, Mr Johnson?

MR JOHNSON: No, thank you, my Lord.

MR JUSTICE GOSS: We will be seeing Professor Arthurs again?

MR JOHNSON: We will.

MR JUSTICE GOSS: But not today. Thank you very much indeed for coming. You know the rules. Don't talk to anyone about this case, the evidence, anything relating to it.

ARTHURS: Yes, my Lord.

MR JUSTICE GOSS: Thank you very much indeed.

(The witness withdrew)

MR JOHNSON: There's a matter of law that we need to deal with. It may be an idea, I am throwing it out for consideration, for the jury to take an early lunch and perhaps we start slightly

earlier after the break, rather than getting them out, dealing with the matter of law, getting them back, doing 10 or 15 minutes.

MR JUSTICE GOSS: Yes, well, there's going to have to be a 10 to 15-minute break now. What Mr Johnson is suggesting to me is that we start the lunch break now, instead of having it between 1 and 2.10, we have it between 12.30 and 1.40. Are you content with that? It just means that we're not wasting 10 or 15 minutes. So we will do that then. I'm sorry it's been a short morning.

(In the absence of the jury)

(The witness withdrew)

Application for special measures

MR JUSTICE GOSS: The application for special measures. You've now seen the statement?

MR MYERS: We have, we're grateful for that.

MR JUSTICE GOSS: From the witness. It speaks for itself.

MR MYERS: And to take a different view would be to deviate from the approach we have taken, which is subject to the nature of the measures, so we don't dispute the request for them.

MR JUSTICE GOSS: Thank you very much. I'm satisfied that the statutory criteria are met for a special measures direction being made in the case of Caroline Bennion for her to give her evidence screened from others in court and accordingly I make such a direction.

So when we reassemble at 1.40, she's the next witness?

MR ASTBURY: She is, yes.

MR JUSTICE GOSS: Then the screens can be in place and she can be in place.

MR ASTBURY: Thank you, we'll liaise with the court staff.

MR JUSTICE GOSS: If you want to make it quarter to, it's up to you. If 20 to is all right... Thank you very much.

(12.32 pm)

(The short adjournment)

(1.40 pm)

MR JUSTICE GOSS: Yes, jury in, please.

(In the presence of the jury)

MRS CAROLINE BENNION (sworn)

Examination-in-chief by MR DRIVER

MR DRIVER: Could you please tell the court your full name?

BENNION: Mrs Caroline Bennion.

DRIVER: Mrs Bennion, as I'm sure you're aware, you've been invited here this afternoon to give evidence about events that took place in early June 2015.

BENNION: Yes, correct.

DRIVER: As of June 2015, could you just tell the jury about your professional status and where you worked and in what capacity?

BENNION: So at that point in time I was a senior neonatal practitioner on the neonatal unit in Chester, a band 6 role. So that entitled me to be either a shift leader or one of the senior, most experienced nurses on duty.

DRIVER: Within the neonatal --

BENNION: Within the neonatal unit in Chester.

DRIVER: The Countess of Chester Hospital, thank you.

As I understand it, could you confirm that in early June, amongst other shifts, you completed two night shifts on the 7th and 8 June 2015?

BENNION: Yes.

DRIVER: And at or around that time, do you recall two twins, [Baby A] and [Baby B] being brought into the unit, being admitted into the unit?

BENNION: Yes.

DRIVER: Were you present during their delivery?

BENNION: Yes.

DRIVER: Is it always the case that staff from your department would be present at a delivery?

BENNION: We would be present at a delivery of a preterm baby, less than 34 weeks or if requested to attend by the medical staff for a predicted sick term infant.

DRIVER: And you will recall that your department were on notice that [Baby A] and [Baby B], the twins, would be delivered and they'd be delivered at a point in time prior to the 34-week gestation point?

BENNION: Yes.

DRIVER: Were you alone from your department or were you in company with somebody else in the delivery unit?

BENNION: I can recall that I was the only nurse. However, there was a registrar and possibly another doctor. As they were twins, more people are required.

DRIVER: Thank you. I'm sure this is not controversial: were you given the responsibility of assisting Dr Beech in the delivery and the care for the second twin, [Baby A]?

BENNION: I believe from my recollection I was, yes.

DRIVER: And do you recall the delivery of [Baby A]?

BENNION: I recall the delivery of both the twins, yes.

DRIVER: Could you inform the jury as to your role in and around the delivery of the twins?

BENNION: So as the nursing staff at the delivery of a preterm baby, it requires you to check the Resuscitaire, which is a level platform that's got oxygen, suction, and a Neopuff, which will deliver breaths to the baby. It will also have a heat source on it to keep the baby nice and warm, and I would take monitoring equipment that I would put on the baby, on [Baby A] and [Baby B], and check their oxygen levels and their heart rate and just assist the doctors with anything that they require.

DRIVER: So amongst other responsibilities, you had to ensure, pre-delivery, that all the potentially necessary equipment was there, in place and functioning as it should be?

BENNION: Yes.

DRIVER: And no doubt you did so in this case?

BENNION: Yes.

DRIVER: Upon delivery, could you confirm that [Baby A] required some respiratory support?

BENNION: He did require some, which is expected, yes.

DRIVER: What was the nature of that support and did you participate in it or not?

BENNION: I don't recall, no, sorry.

DRIVER: You've already intimated that you recall the delivery in the immediate aftermath of his sister, [Baby B]. What do you remember about that?

BENNION: I recall [Baby B] needed a little bit more assistance so I went to help with her assistance at delivery, some airway manoeuvres, and ensuring she was breathing correctly and her heart rate was the required -- the support was given for her.

DRIVER: Thank you. When you use the phrase "a little bit more", is that as compared to her brother?

BENNION: Yes. She required a little bit more stabilisation than her brother.

DRIVER: Thank you.

Was it always anticipated that, upon delivery, the twins, both of them, would be transferred into the neonatal unit that you helped staff?

BENNION: Yes, all babies under 34 weeks are admitted to the unit, particularly twins of 31 weeks would be expected to be transferred, once stable, straight through to the neonatal unit.

DRIVER: So no doubt the neonatal unit had been prepared to receive them upon transfer?

BENNION: That's correct, yes.

DRIVER: And what's the protocols there for those preparations?

BENNION: Normally, either the shift leader, or anybody that's on the unit whilst I had gone through for the delivery, would be ensuring that the temperature of the incubator is set appropriately, setting up humidity in the incubator, so that's to make the environment of the incubator nice and warm and humidified. They would be checking a ventilator or some respiratory support, CPAP. They would be potentially running through some IV fluids or preparing a trolley for the doctors to cannulate the baby.

What a cannula is is to insert a drip into the baby to -- most babies at 34 weeks would require some intravenous fluids, potentially antibiotics. So they would be preparing the scene to make the transfer as smooth as possible.

DRIVER: Thank you. To go back to the particular circumstances of these twins, do you recall that [Baby A], as the more stable, so perceived, was transferred first?

BENNION: That's correct.

DRIVER: And I think it's a matter of record, you remained with [Baby B] in the theatre until she was stable enough to join her brother and be transferred too?

BENNION: Yes.

DRIVER: The twins were brought into the ICU, also referred to as room 1 or nursery 1; is that right?

BENNION: Yes.

DRIVER: And did you provide care, the care for [Baby B], while a colleague of yours primarily looked after [Baby A] in the first instance?

BENNION: Yes.

DRIVER: And do you remember which colleagues that was at this point in time?

BENNION: On the transfer, on that first night, it was Ashleigh Hudson who was the band 5 nurse, so a little bit more junior to myself.

DRIVER: Thank you. As part of the immediate care for [Baby B] do you recall that upon arrival within the unit, Dr Saladi, the consultant in question, came and reviewed her well-being?

BENNION: Yes, he did.

DRIVER: And how was she at that point this time; do you remember?

BENNION: She recovered very well, she was active and vigorous and pink, and the decision was made by Dr Saladi, but also in consultation with myself as the nurse, that as she was sort of breathing for herself and breathing against the ventilator, would we extubate her, so take the tube out, and try her on CPAP

or would we have to give her some more pain relief and potentially sedate her to continue with her ventilation.

After reviewing her, we felt that we would try her off the ventilator because she was so vigorous and active and that's what, of course, we did. We extubated her, which is pulling out the little tube, and she could breathe for herself then.

DRIVER: Amongst that description you used the phrase "she was breathing against the ventilator". Explain that to the jury.

BENNION: She was. At delivery she needed some support with what's called an endotracheal tube, which is where babies can still breathe for themselves, but we can take over their breathing.

I can't recall whether she was doing all the breathing for herself but she was quite vigorous and active and recovered from her stabilisation, so it was a decision by Dr Saladi at that point to remove that tube and try her off the ventilator because she looked as if she would be able to cope with that.

DRIVER: Thank you. We're now going to look at some of the records that you helped or contributed to completing at the time, which record the events over the next few hours or at least for the remainder of that shift. Is it right that you provided care and attention to both [Baby A] and [Baby B] at different times?

BENNION: I predominantly provided care as a designated nurse for [Baby B]. However, I would have potentially assisted with drawing up any medication that [Baby A] required as I was working in nursery 1 at that time.

DRIVER: So on occasions, although each baby has a designated nurse, the nurses assist each other as and when required?

BENNION: Yes, as children's nurses it requires two members of trained staff to check all drugs and all IV fluids, so I potentially would have checked any other medication, but I can't recall if I did. But that's the usual practice.

DRIVER: It's a matter of record, so we'll assist you. We'll do it firstly by looking at where you have made contributions to the records for [Baby A] and then in turn to [Baby B].

You see the screen in front of you. We'll go to our slide 17 -- you're already there, Mr Murphy.

The way this works, Mrs Bennion, you have not seen this before, we have here a chronology of the events in relation to [Baby A]

and we see that he was given medication and according to this, both yourself and Christopher Booth do appear on the corresponding records.

If we go behind this screen, there's a summary of the prescription. If we go behind one more stage you'll see something that you will recognise now, which is the corresponding records created at the time within the unit. So that's how this presentation works.

You're quite right, we'll see -- if we go back, please, Mr Murphy, to the first page, we will see that. At this time, which is 22.46 and 22.47, you co-signed, I think is the phrase you would use, for medication given to [Baby A] by the nurse designated for his care at this point this time, your colleague, Christopher Booth. So if we just keep scrolling across, Mr Murphy.

And you, I'm sure, would recognise, would you, Mrs Bennion, the nature of the medication provided to the baby at this very early stage in his life, he having been delivered prematurely and brought into the unit? And is this -- do you recognise this as typical, predictable standard medication to provide to a baby of his gestation?

BENNION: Yes. They're both antibiotics, which are broad spectrum antibiotics, which we use for early onset sepsis, which we're presuming all preterm babies are covered for.

The caffeine citrate is a respiratory stimulant, again for babies born less than 34 weeks that require some respiratory support, so it's a stimulant to help them with their breathing.

DRIVER: You did imply it, but to spell it out, the antibiotics, are they a response to evidence of sepsis or are they a precautionary measure?

BENNION: A lot of the time they're precautionary. I can't recall whether there was any signs of sepsis but the majority of the time preterm babies are all -- particularly babies born at 31 weeks -- are automatically given antibiotics without us ever knowing, so it's for suspected infection rather than confirmed infection.

DRIVER: Thank you. If I could ask, please, Mr Murphy to go forward, please, to our slide 44. We see reference to your name on a series of observations, both of the baby and of the corresponding equipment, and these took place at about 4 in the morning on 8 June. If we can just click behind that, we see somebody else's summary. And go back a stage further to an

observation chart, the likes of which I'm sure you're very familiar with.

If we glance down at the bottom where the nursing staff record their initials, as we understand it, do you see your own initials there?

BENNION: I do, yes, at the bottom.

DRIVER: Does it follow therefore that you undertook some of what we understand are hourly observations of the baby?

BENNION: Yes, that's an hourly recording of all [Baby A]'s observations for that hour.

DRIVER: And do you recall undertaking those observations or not?

BENNION: I don't recall, no.

DRIVER: Very well. Let's go back to our main page then, please.

So there is the record of the observation. Next, at number 45, please. Record of the equipment settings. Could we look at that, please? It's a summary and the original there. Go to the bottom of the initials. Do you see a contribution made by yourself there or not?

BENNION: No, not that I can see.

DRIVER: Very well. We'll ignore that then.

The next chart, please, 46. Before we even begin to consider the detail, could we scroll down? In fact, Mrs Bennion can tell us whether or not she has in fact -- sorry, to the side, it's the side column of this chart, my mistake -- whether your initials are there or not?

BENNION: Yes, they correspond with the 4 o'clock in the morning -- they are observations for the IV fluids, they correspond with the observations that I took at 4 o'clock as well.

DRIVER: Right. So looking at those three underlying documents together, does it flow that you made some observations at 4 am, but that appears all in relation to this particular baby?

BENNION: Yes.

DRIVER: Thank you very much.

If we could then, please, go back to the main page and fast forward, as it were, to slide 159. We can see there that we are now moving forward in time considerably. We are now on Monday, 8 June 2015, and the time is 19.28, approaching 19.30, which, as we understand it from other evidence, but could you please confirm, is about the time the night shift starts?

BENNION: Yes, correct.

DRIVER: And you were starting the night shift at about this time on that date; is that right?

BENNION: Yes.

DRIVER: Were you designated a particular baby to take care of on that night shift?

BENNION: So on that night shift, this was my second night, from my recollection I was allocated to look after [Baby B], [Baby A]'s sister.

DRIVER: We've been told, and do you recall, that [Baby A] and [Baby B] were still kept, housed, looked after in the same nursery using adjacent neighbouring incubators?

BENNION: Yes.

DRIVER: Does that accord with your recollection?

BENNION: Yes, it does.

DRIVER: And do you recall the significant events that took place in relation to [Baby A] shortly after your night shift began?

BENNION: I do from reading my records and my statement, yes.

DRIVER: And to assist you in making that statement to the police, you were given and you took the opportunity to remind yourself of the underlying clinical records, the likes of which we've glanced at superficially this afternoon; is that right?

BENNION: Yes.

DRIVER: We all know, the jury have already heard evidence, that [Baby A] suffered a collapse that evening, which tragically led to his death.

BENNION: Yes.

DRIVER: Were you in the room when the first signs of that collapse became evident?

BENNION: Yes, I was.

DRIVER: Where were you and what were you doing as best you can recall?

BENNION: I can't recall actually where I was, but I know that at 7.30 the night shift that had come on, which was myself -- we take handover from the day staff at the cot side, so next to the baby that you are allocated to, so that would have been [Baby B]. So I would have taken a comprehensive update from the day staff, I would have had a paper chart, I would have documented any concerns or any medication that is needed, signed my equipment checks and checked all my equipment checks -- so what I mean by my equipment checks are checked my suction was working, my Neopuff, my fluids corresponded with the prescription and were accurate, and that I'd taken a comprehensive handover from the day staff and I knew what the night staff would entail at that point.

DRIVER: Thank you. The jury have heard the handover process has two phases. Is this right, at that time there's a huddle where teams meet effectively and the shift leader or leaders inform you of the general position and then, more specifically, you have a one-to-one with your counterpart who was the previous designated nurse for the baby that you have been directed to look after on your shift?

BENNION: Yes, that's correct.

DRIVER: And as part of the handover process you have just outlined, it's protocol that you check all the equipment to make sure it's fit and ready to go?

BENNION: Yes.

DRIVER: Thank you.

Again, where were you when you first became aware that there was a problem with [Baby A]?

BENNION: So from reading my statements, I was next to -- in the same room as [Baby A] but I was next to [Baby B], probably because the babies were HDU/ITU requirement, so a little bit more intensive, I would have probably have still been doing my checks, checking [Baby B] over, checking her heart rate, breathing, completing my observations and just making sure that all my safety checks were fulfilled.

DRIVER: Mrs Bennion, you say "probably", is that based on the times or based from an actual memory of the events?

BENNION: I do remember being in the room and also that correlates with the time of the event as well that I would have been in the room. I wouldn't have left [Baby B], who I was designated to be looking after.

DRIVER: Thank you. And what do you first remember of [Baby A]'s deterioration?

BENNION: I remember Lucy asking for some assistance and hearing -- each baby is attached to a Philips monitor, which is a saturation and heart rate monitor. So I remember Lucy asking for help, but at that point I was with [Baby B]. When it became more obvious that she needed assistance straightaway and I knew [Baby B] was safe, I moved over to help assist with [Baby A].

DRIVER: Thank you. When you say Lucy, you mean Lucy Letby?

BENNION: Lucy Letby verbally asked for help and I went over to help.

DRIVER: Thank you. Can you remember whether or not there was an alarm sounding or do you not have a recollection?

BENNION: I don't have a recollection.

DRIVER: Thank you. Do you recall whether, in addition to Lucy Letby, there was anybody else at [Baby A]'s incubator at the time you were first alerted to his problem?

BENNION: At that time both babies -- it was quite a busy evening, both babies were having what are called long lines being put in. So they are lines that will go into a larger vessel so we can give intravenous fluids, so at that time I remember the nursery being quite full because you've got a crossover of day staff and night staff and I also remember the registrar, Dr David Harkness, being present -- and I remember that not only from my notes but actually my recollection that he was present. There were other doctors but I can't recall their names.

DRIVER: Thank you. When you say that at that time both babies were having long lines fitted, do you mean that literally, the process of inserting long lines was taking place at that point?

BENNION: I believe they'd been put in. However, we were waiting on confirmation from the X-ray, because I remember recalling seeing the trolleys that we use for the procedure set up with sterile towels over them, which indicates that the doctor has inserted the line. To keep everything sterile and to fix the

dressing once the X-ray's been confirmed, they leave it covered to keep the sterility of the procedure.

DRIVER: Thank you. Having had your attention drawn to [Baby A], did you go to his incubator and assist?

BENNION: Yes, immediately.

DRIVER: Can you recall what assistance you gave?

BENNION: I recall I helped Lucy Letby deliver some ventilation breaths via the Neopuff, which is where, if the baby isn't breathing, and it's apparent that their oxygen levels, their saturations and their heart rate is dropping, we can deliver some breaths to the baby voluntarily by a face mask and deliver oxygen to the baby. So I remember helping her to deliver those breaths.

DRIVER: Does it follow that you were the quickest to respond, you were the first person to the incubator, Lucy Letby having asked for help?

BENNION: Yes.

DRIVER: And can you recall who else followed you to give assistance?

BENNION: As the doctors were already present in the room, there was no -- I... There was no call out, as in a crash call put out, which we would do if we needed immediate assistance, because the doctors who would attend that crash call were already there. So I believe that a crash call wasn't put out because the doctors were present, so they were also there to assist.

DRIVER: And that being Dr Harkness?

BENNION: Yes, Dr Harkness.

DRIVER: And we know from the notes that a Dr Christopher Wood, a junior, a trainee, acted as scribe, so his presence is established through the notes. And during the process we also know already that the consultant Dr Jayaram attended?

BENNION: Yes.

DRIVER: Do you remember all of that?

BENNION: Yes.

DRIVER: And can you tell us in a sentence or two what contribution you made to the attempted resuscitation process?

BENNION: Actually, because there was two doctors there, very senior, and also a junior doctor to scribe, to write down the events in chronological order, which is very important, I believe I took the role of drawing up the emergency drugs that were required, checking them against the algorithm, also getting a second check, and then passing them. I don't remember who I passed them to but passing them over to the medical team to administer to [Baby A].

DRIVER: Thank you. The jury were taken to evidence yesterday which charted the progress of the resuscitative process, which we all know, tragically, was futile, ultimately futile. Were you present when [Baby A] was declared dead?

BENNION: Yes, I was.

DRIVER: Of course there were other babies in the unit, including his sister --

BENNION: Yes.

DRIVER: -- and their needs were continuing.

BENNION: Yes.

DRIVER: And so soon after, did you return to [Baby B] to attend upon her?

BENNION: Yes, I did.

DRIVER: But of course you would have been aware of the process, necessary process, of the family involvement and all else that was taking place within the unit?

BENNION: Yes.

DRIVER: [Baby B]'s demands were such that you turned your focus to her; is that right?

BENNION: Yes.

DRIVER: Thank you. I'm now going to take you through the corresponding records in relation to [Baby B], if I may. I'll ask Mr Murphy to move to her data.

You were looking after her on that day and I believe you also looked after [Baby B] the following night shift, as you've already indicated?

BENNION: Yes.

DRIVER: And it's that primarily that I want to focus upon now, if I may.

So if we go to tiles -- we're there already, thank you very much. To orientate ourselves now, it's Monday, 8 June at 23.00 hours. Firstly, we can see at slides 12, 13 and 14, if we scroll across here, we see the same or a similar sequence of tiles now relating to [Baby B], which record, do they, that at around 11 pm that night, you took hourly observations of [Baby B], you completed intensive care checks, and completed the chart and checked the settings? We'll look at them one by one, please. Go behind. We'll look at the original.

Do you see your initials down below?

BENNION: Yes, I do.

DRIVER: And do you recall looking after [Baby B] at this point --

BENNION: Yes, I do.

DRIVER: -- in time? You can be taken to the specific date if anybody cares to do so, but in general terms how was she and what was going on with [Baby B]?

BENNION: Following the initial stabilisation at her delivery, where she did require more support than her brother, once we safely transferred her to the neonatal unit, to nursery 1, and the decision was made by Dr Saladi on that first night to extubate her, to remove the ET tube and to try her on CPAP -- which is another form of breathing support, where the baby breathes for themselves, it's just giving them additional support -- she remained stable. All her observations were within normal limits and there was no concern at that point.

DRIVER: Thank you. If we could come out and go to the main page, please, Mr Murphy, and go to slides 17 to 27. This just charts your notes and we'll just look at the time settings.

So it's the protocol, isn't it, that every hour the same observations are repeated and the same data is recorded, so retrospectively we can see any patterns that may have been developing?

BENNION: Yes.

DRIVER: So here, we see checks done at midnight now, so we're just moving into Tuesday, 9 June. If we go to slides 21 to 24, please, we'll see the same repeated on or around 1 am.

25 and 26, an hour later and so on. 28 to 30, around 3 am. 32 to 34, now moving to the early hours of the morning. 35 to 37, 4 o'clock to 5 o'clock. Gases at number 38 taken at 5.27. Same measures, same records at 6 am recorded behind slides 39 to 41.

Seven in the morning. Now we're approaching the end of your shift at slides 43 to 45. And in short, Mrs Bennion, did you observe anything exceptional or concerning in relation to [Baby B] through that course of measures and observations?

BENNION: No, I didn't.

DRIVER: Then at slide 46, we're now at the end or approaching the end of your shift. Do you recall handing [Baby B]'s care over to your colleague, Joanne Williams?

BENNION: I don't recall handing over to Joanne Williams, now.

DRIVER: But the fact of the handover will be a matter of record?

BENNION: Yes, it was, yes.

DRIVER: And I think having completed those two night shifts, then you were out of the ward for a day or two; is that correct?

BENNION: That's correct.

MR DRIVER: Thank you. Could you remain there, please, and answer any questions that may be asked of you?

Cross-examination by MR MYERS

MR MYERS: Mrs Bennion, I'm going to ask you some questions on behalf of Lucy Letby.

BENNION: Okay.

MYERS: Just some general questions first, if I could, if you'd help us with this. You have a long experience of nursing in neonatal care, don't you?

BENNION: Yes, I do.

MYERS: And would it be about 23 years or so in neonatal care or a little bit longer?

BENNION: It's a little bit longer now, it's nearly 30 years now.

MYERS: Right. You're familiar with the practising and the organisation -- the practice and the organisation of a neonatal unit?

BENNION: Yes.

MYERS: Is that correct? And we've heard there are guidelines issued by the BAPM as to how that unit should be staffed; is that correct?

BENNION: Yes.

MYERS: And you're familiar with those?

BENNION: Yes, I am.

MYERS: You've practised as a shift leader, haven't you, at the Countess of Chester neonatal unit?

BENNION: Yes, I have.

MYERS: And could you help us with that? If you're the shift leader does that mean you play a part in organising the nurses to make sure you have the right nurses on the right shift for the right patients?

BENNION: The rota is previously allocated by either the deputy manager or manager, so they will look at the skill mix required ahead of time -- it's normally 6 weeks ahead of time. So whoever's doing the nursing rota will look at the skill mix required, look at how many senior nurses we need, how many junior nurses we need and how many nursery nurses we need to safely staff how many beds we had available at that time.

MYERS: Obviously you plan ahead but the very nature of the work you're doing means that sometimes you have to re-arrange staffing plans at quite short notice, don't you?

BENNION: Yes, we do.

MYERS: And could it sometimes be a challenge to get the right numbers of staff in for the right level of care on any particular shift?

BENNION: We were always very fortunate that we have a lot of senior staff and we were always very supportive of junior staff; junior staff wouldn't be left to look after babies without that support. But there were occasions when we had busier periods, but that's, as you've said, the nature of a neonatal unit. We have no prediction over our admissions.

MYERS: The period we're looking at in this case is from June 2015 through to June 2016. I don't know how easy it is to cast your mind back to things like this. But was that in fact quite a busy period on the unit?

BENNION: It was a busy period.

MYERS: And did you find or seem to find yourselves dealing with more babies requiring a higher level of care?

BENNION: Yes, we did.

MYERS: None of these things are asked critically of you organising the staff, can I make that plain, that's not the point of the questions. But, for example, in the ICU room, it's meant to be one band 5 at least who's specialised in ICU to one cot, isn't it?

BENNION: That's the BAPM guideline, one to one. That's the gold standard.

MYERS: Yes. Was it sometimes difficult to maintain those figures given the demands on your resources?

BENNION: Sometimes it was difficult, but the majority of the time that was always the desired aim.

MYERS: Plainly, but there were times when it just couldn't be achieved, weren't there?

BENNION: Yes.

MYERS: Looking after premature neonates is in itself an intensive task, isn't it?

BENNION: Yes.

MYERS: And there's an awful lot to observe and monitor, isn't there, Mrs Bennion?

BENNION: Yes, there is.

MYERS: In your experience, it's quite possible, isn't it, for a neonate who appears to be stable to deteriorate?

BENNION: These babies are very vulnerable and there is always the potential that they can deteriorate very rapidly. That's why, obviously, hourly observations, particularly in the first part of their journey on the neonatal unit, is vital.

MYERS: In your experience, you've known for instance a baby who might even be about to go home to suddenly deteriorate?

BENNION: Yes, that has happened.

MYERS: Or you leave a shift and you come back on to a later shift and find that there's been a deterioration whilst you were away?

BENNION: Yes, that has happened.

MYERS: I'm going to ask you about something different if I may, please, Mrs Bennion. That's to do with medication, as in giving medication on the unit. Is it the rule that there are always two nurses to check medication that's given, that's prescribed?

BENNION: There's always two nurses, that's correct.

MYERS: I'm going to put up one of the prescription records that we have and just ask you to help us with exactly what it means.

Could we put up, please, Mr Murphy, J1089? That's slide 17 on the [Baby A] timeline.

It's probably easier to enlarge the top half and then we can move to the bottom half. If we could just let Mrs Bennion see the whole slide first just to familiarise herself with it, just a quick glimpse of the top and bottom, and then I'll ask you about both halves since that's the easiest way of putting it on the screen.

(Pause)

This is dealing with the prescription for gentamicin, Mrs Bennion, on Sunday, 7 June at 22.46, 10.45 in the evening, when you were on the shift. No one's going to expect you to refer the specifics of it, it's just so you can help us with the data we see. Where does a document like this fit into what you're doing on the unit, if you could explain to the jury, please?

BENNION: Gentamicin is one of the antibiotics that we use in conjunction with benzylpenicillin, so they are for suspected infection.

MYERS: Sorry to interrupt, can I assist? First of all, the actual document itself, what we're looking at, where would you see what we're looking at here when you're at work?

BENNION: At that time gentamicin was on a paper chart so it was on a prescription paper chart.

MYERS: Would you see anything on the unit working there like we're looking at now on these screens?

BENNION: Not in that set-up there, but that looks as if it's an order on Meditech, which at the time was our computer system.

MYERS: Right. So this is something which is set up when the prescription is made, is it?

BENNION: It looks like that, yes.

MYERS: If we just -- we can see it's for gentamicin and that would be something you'd give to neonates because of the risk of infection that they face; is that correct?

BENNION: Yes.

MYERS: Because they are at risk of infection, aren't they?

BENNION: Yes.

MYERS: And if they are hit by infection its rate of progress can be very rapid indeed, can't it?

BENNION: Yes, it can.

MYERS: So we can see what it is and if we just move down can you help us, as far as you're able -- if we look where it says "Start 070615 2200", so we're about halfway down that page.

BENNION: Yes.

MYERS: "Refill frequency." We can see a name, "M Saladi". "Clinical indication." So just looking at that section around there, what does that tell us, if you can help us with that?

BENNION: The start date of the prescription for giving the drug is at 22.00 hours on 7/6. It's ordered by Dr Saladi, who's the consultant. And the clinical indication of why we're giving the gentamicin is suspected sepsis.

MYERS: Thank you. Does that mean that Dr Saladi will have put this order on to the system at that time, at 22.00?

BENNION: Potentially, yes.

MYERS: All right. We're going to scroll down then to see the bottom half of the form and ask you to help us with this. We've seen the top half. So "Administration, history, detail". And we can see, starting at the top:

"Scheduled 07/06, 22.00. Administered at 07/06, 22.46. Dose given. User: NBOOC..."

And some more data. And underneath it:

"Co-signer: NBENC."

Which is you, isn't it, that bit?

BENNION: I can see by "Christopher Booth" there I can see the new order above --

MYERS: If we start with scheduled, does that link it to the prescription that we've already seen where it says "07/06 2200"?

BENNION: Yes.

MYERS: And we know this is dealing with the dose of gentamicin. Can you help us with this? C Booth under user, is that one of other nurses on the unit?

BENNION: Yes, that's another senior nurse on the unit.

MYERS: Is that Christopher Booth?

BENNION: Yes, correct.

MYERS: And co signer, NBENC, Bennion, Caroline, is that you?

BENNION: There's myself, yes.

MYERS: Looking at that, does that assist us or doesn't it with who did what in relation to the medication?

BENNION: So that looks as if, from this administration, that Christopher Booth has given the medication and that I have co-signed it, so I'm the second person checking the medication.

MYERS: So the person who gives the medication, does their code or their name always go under "user"?

BENNION: It would depend on who was logged on to the computer first, but potentially it would be the administration person is the person giving it and the co-signature is the checker as such, the second check.

MYERS: Does "user" refer to user in terms of something to do with the medication or user of the system if you see what I mean? User of what?

BENNION: It could be both. So whoever's logged on to do -- to bring the prescription up, that would have their mnemonic on it. So in this case Christopher Booth had logged into the computer and I have -- so potentially he has drawn up the drug and I have checked it as the co-signer.

MYERS: Right. Thank you. I'm just going to check now that this is right by asking you this. So someone -- one of the nurses signs on to the system?

BENNION: Yes.

MYERS: And the one that does that, their detail will come up under "user"?

BENNION: Normally that's the case.

MYERS: And what you're describing is that the one who does that will very often or is likely to be the one who is going to be administering the medication?

BENNION: Yes. Not always the case because it may be that the two of you are doing it together and it might be that it's more appropriate that the second person gives the drug, but normally the person that has logged on to the computer, as in this case Christopher Booth, has given the medication and I have co-signed it.

MYERS: Right. And someone has to co-sign it because there have to be two nurse practitioners dealing with the medication?

BENNION: Yes.

MYERS: So user is a guide to who may or may probably have administered it, but it isn't always going to be the case?

BENNION: Not always the case, but predominantly it is.

MYERS: Thank you. All right. That's what I wanted to ask you about that. Thank you, Mrs Bennion. Thank you, Mr Murphy.

Still dealing with what happens on the unit in terms of duties, I'm going to ask if we could put up a document which we're calling the neonatal review. It's not something I imagine you'll have seen before, Mrs Bennion, but it's the neonatal review for [Baby A], please.

Whilst we do that, ladies and gentlemen, my Lord, I wonder if those who want to can have the iPads because I want to be able to look at a particular document or documents while we're

looking at what's on the neonatal review. Those who wish to do so, if you look into the iPads.

Can I ask if we can scroll down the neonatal review, please? Pause there if you don't mind. Unfortunately, my copy doesn't have line numbers on it. Could we scroll down again, please? All right, thank you, that will do for now.

If we look at line 48 on the review, Mrs Bennion, you can see it says "intensive care chart", one that's completed by you or dealt with by you, and the timing is given at 20.00, so 8 o'clock.

BENNION: Yes, correct.

MYERS: This may not be the precise one, but by way of example, ladies and gentlemen, if you go to tile 52 in the [Baby A] timeline -- I'm afraid there's going to have to be a little -- to assist Mrs Bennion, a little moving in and out of the screens. So in fact maybe we have to put up for the time being tile 52 on the screen.

I just want to ask you about the chart we see here. We've seen that at 8 o'clock you are involved in completing a care chart for [Baby A]. Just a general point, Mrs Bennion: for an entry on one of these charts, how long does it take to do what the nurse has to do and then complete what we see on the entry? Any one of the entries, but just to give us a guide. The type of work you're doing, the tasks you do, and how long it takes.

BENNION: It depends if you are performing any nappy changes or any mouth care changes. But if it's just a direct observation of that baby at that time, approximately 10 minutes.

MYERS: Right. Ten minutes if it's just a direct observation and if it does involve things like nappy changes or other tasks like that, how much time might you spend at that point looking after the baby so you can complete the chart and that task?

BENNION: Potentially 20 minutes, 25 minutes.

MYERS: So maybe 10 to 25 minutes? Thank you.

Another chart that we've seen, let's stay on the screens that we've got. If we put up tile 53, please, so the next in line, and it's a blood gas chart. Again, I'm not concerned at this point on what lies behind the entries, I'm not going to ask you questions about what they mean or anything like that. But we've seen that at intervals the nursing practitioners will do bloods, they do the blood gas readings. How long will that take when we

see that they are doing that? How long would it take to do a blood gas?

BENNION: So we would ensure that the baby was not going to suffer any pain, so potentially we would have to comfort the baby. If we had our equipment all ready, so a method of getting the blood, the blood gas, but actually running -- the blood gas machine is on the unit so we don't have to leave the -- it's literally the next door to us at that point.

So you would, via a heel prick, at this point, get -- fill a little capillary tube, which would go to a blood gas machine, which was literally in the -- a room that you can see opposite nursery 1. That would take approximately 3 minutes to run through, 3 or 4 minutes to run through. It would give you a readout, an automatic readout, and you'd take that back to the cot side.

MYERS: Pause there. Just check we've got all the steps there. So when it is time to do a blood gas, the nursing practitioner wants to read the blood gas, you said there's a heel prick is what you would have done. Just so we know for those people who don't understand, what do you mean by a heel prick? What does that involve?

BENNION: We would have to collect our equipment, which would be a piece of gauze -- it would be a method for cleaning the skin, and what's called a Tenderfoot, so a Tenderfoot is a small little device that produces a nick in the baby's foot, and then that lets the baby deliver a little bit of blood in a blood spot and that's collected via a tube, a capillary glass tube. That's sucked up from the babies' heel. That's the method that we obtain blood tests from a lot of babies.

MYERS: So having done that, then you said there's -- you take that to a machine?

BENNION: You take that to a machine that's on site, doesn't have to go anywhere. It's a blood gas machine that we have on the unit. It's just in a little room which is -- at that time was opposite nursery 1.

MYERS: Right. And you put it into the machine, you get a printout, do you?

BENNION: You get a printout within 2 minutes.

MYERS: And then is that -- you take that back to the chart -- you tell us what do you do once you've got the printout.

BENNION: You take that back to the chart, you would document that and you would inform the doctor of the blood gas for any instructions of what needed any interventions from that blood gas.

MYERS: And assuming there's nothing unusual that happens from the time that the nursing practitioner starts preparing to take the heel prick to notifying the doctor? I'm not asking you to be absolutely precise. What sort of period of time might that take though to do that process?

BENNION: It could be 5 or 10 minutes, that's all.

MYERS: All right. One other chart that we've seen, so let me ask you about that whilst we're here. It's the observation chart, so can we go to tile 54, please, Mr Murphy.

We know that the observations consist of heart rate, respirations, sometimes, usually, temperature, but not always. Can you just explain how this fits in with what you've been describing in terms of timing, how much time it would take?

BENNION: These are hourly recordings or if the hourly recording isn't on the hour then it will say slightly under. So you've got -- the first entry there is I think it says 20 -- 20.50 if I can see that correctly. So you would record all your observations, document those, and if you needed to do any blood test, any blood gas, you would do that after you'd recorded your observations.

MYERS: Could you just look at the foot of the chart, please, Mr Murphy? The other details we see there written in sometimes, can you just explain what they are and where they fit into the observations at the foot of the chart? Thank you.

BENNION: At the bottom there, the SAO₂, that's the baby's saturation results, which is a reading on a monitor. That's a score out of 100 and we're looking for a preterm baby to have saturations of 92 to 94/95. The oxygen below tells you whether the baby -- the first entry is air, then the next entry is 32% oxygen, so that's the volume of oxygen that's going into the baby.

Cares and position. Cares relates to whether the baby's had its nappy changed or mouth care. The position is whether you have altered the baby's position.

Incubator temperature is how warm you need that incubator to keep your baby nice and warm. Humidity for a preterm baby is at 70% there, which is an appropriate set humidity, it's a nice warm, moist environment for a newborn baby's skin -- and a

preterm baby's skin is prone to infection, so we need to keep a nice moist environment --

MYERS: Is that within the incubator? Pardon me for interrupting. Does that mean humidity within the incubator?

BENNION: The incubator humidity, yes. The next result is a blood pressure, which is done via a cuff, which pumps up the baby's limb. And then the bottom, where it says mean, is the average. In neonatal care you have your top, which is your systolic, and your bottom, which is the diastolic, but actually the mean is quite important for a baby and that should correlate with their gestation. It can be higher or it can be lower depending on the activity of the baby.

MYERS: So there's a number of activities involved in the observations that are recorded in the chart. Again, just so we can fit it into what a nursing practitioner is doing on the unit, what sort of time does it take to do that, to carry out those observations and to complete the form?

BENNION: It can vary. Like I said earlier, if they are straightforward observations and none of your findings are of concern, then it can be quite straightforward, it can be 10, 15 minutes. However, if you need to do any cares or position the baby, depending on how they tolerate that positioning or depending on whether you need to do a blood pressure or any additional tasks, it can last longer and then you would be looking more towards 25 minutes.

MYERS: Right. Thank you. With that in mind I'd be grateful if we leave this image and go to the neonatal review for [Baby A], please, Mr Murphy.

Enlarge it so we can see activity at about 20.00, so the central part of the chart. Yes, from there, please, and down a little bit further.

If we look at the chart, this is so you can explain this to us, Mrs Bennion.

If you look at lines 41 and 42 to start with -- sorry, line 42. We can see that at 20.00 it has you recorded doing the intensive care chart for [Baby B]. Can you see that?

BENNION: Yes, I can.

MYERS: It says 20.00 on that. From what you're saying, 20.00 there reflects the time that's been put on the paperwork; is that correct?

BENNION: Yes.

MYERS: In reality, it's going to be something that spans a greater period of time than exactly 20.00, isn't it?

BENNION: Yes. However, if you were writing down the exact time that you did it, all your observations would be a mess and hard to chronologically follow. So a lot of the time, if you're recording observations that you started at 8 o'clock/20.00 hours you'd document that for 20.00 hours.

MYERS: Yes, but the point I'm seeking to just explore with you, although we see the time 20.00 there, that reflects an activity that could have lasted up to 20 minutes in reality?

BENNION: Yes.

MYERS: And if we come down, please, to line 48. We can see you again for 20.00, Mrs Bennion, and there it's a baby with the initials we can see, just the initials there. It's got:

"Intensive care chart: entry made on chart."

Now, I'm not going to ask you to remember exactly how long anything took at the time, but we can see that's the same time as line 42 with [Baby B]. Is it sometimes the case that a number of tasks will be conducted simultaneously? Is that why we have the two times like that that are the same for different children?

BENNION: It's not necessarily it would be performed simultaneously. However, if you're doing a full set of observations for an ITU baby, it makes sense to put them for each hour, but they may not exactly have occurred at that exact hour.

MYERS: So what we have on a table like this is not, just from what you're describing there, precision timing of what was being done with a particular child at the time we're looking at on that table?

BENNION: Yes.

MYERS: And although there will be times when it appears as if, for example, you in this case are in two places at once doing something, there's nothing sinister to that from what you're describing, it's just the way the timings work out when you're filling in charts but doing different jobs at around the same time?

BENNION: Yes.

MYERS: All right, thank you. Thank you, Mr Murphy.

Because the tasks often have covered a period of time, sometimes tasks will overlap?

BENNION: Yes.

MYERS: I'm going to ask you about when you came on duty with [Baby A], Mrs Bennion. When you came on to the evening shift on 8 June, the child you were going to look after was [Baby B], is that correct, from best you can remember and from your notes?

BENNION: Yes.

MYERS: And also -- she was in nursery 1, wasn't she?

BENNION: Yes, she was.

MYERS: And also in nursery 1 was [Baby A]?

BENNION: Yes.

MYERS: And there was a third child as well, wasn't there?

BENNION: I don't recall.

MYERS: Do you recall there was a point at which the doctor, who is there, Dr Harkness, had indicated that 10% glucose should be run through [Baby A]'s line?

BENNION: I don't recall, it's only from my notes.

MYERS: From the notes you have seen that, though, haven't you?

BENNION: Yes.

MYERS: Do you recall that he was waiting, or someone was waiting, for the results of an X-ray before using the line? Do you recall that?

BENNION: Yes, I do.

MYERS: And so was it the case that the fluid was being run through the line because that's a safe procedure to make sure it doesn't clot?

BENNION: Yes, it is.

MYERS: To the best of your recollection, is that what was about to take place when you came on duty, ready to go to the cot side?

BENNION: When I came on to duty into nursery 1, I remember seeing trolleys set up with green towels over them. So that indicated that the long lines were in, we were just awaiting confirmation to use them.

MYERS: So we can fit this into what we're learning about the way the unit operates, when you go into the nursery, that would be for the cot-to-cot handover; is that correct?

BENNION: Yes.

MYERS: So you've been to what we've heard is the group gathering first, handover then. You have gone to nursery 1 for a briefing with the practitioner who is looking after [Baby B]?

BENNION: Yes.

MYERS: And in fact at this point it was Melanie Taylor who was looking after both [Baby B] and [Baby A], wasn't it? Do you recall that?

BENNION: I don't recall.

MYERS: For the evening shift there were separate nurses for [Baby B] and [Baby A], weren't there?

BENNION: Yes.

MYERS: Which is what you'd expect for the babies in that condition in that nursery?

BENNION: Yes, but they were both stable babies. If they were unstable or requiring any more input then they would have been more one-to-one but actually sometimes, as we discussed earlier, it's appropriate that one nurse could have looked after the both of them.

MYERS: But certainly if we were to go off the guidelines it would be one-to-one, wouldn't it?

BENNION: Once they had their UVC, which is the line into their tummy button or the long line, that would have potentially moved them over to one-to-one. But there is quite a fine line between requirements of an HDU baby and an ITU baby. And it is only when sometimes -- so at the start of the shift they may be an HDU baby and what makes them an ITU baby is the fact that the interventions have increased throughout that shift.

MYERS: And we know in [Baby A]'s case that he'd had a UVC fitted during the shift.

BENNION: Okay.

MYERS: So you've come on, it would have been a little bit -- at least a little bit before 8 o'clock when you first came into nursery 1; would that make sense?

BENNION: Yes.

MYERS: And at that point already they were waiting to have the X-ray confirmed and to run fluid through the line?

BENNION: Yes.

MYERS: And preparations had been made for it to be a sterile procedure, from what you can recall, with a trolley there and the sterile equipment?

BENNION: Yes.

MYERS: Would the nurse running the fluid into the line have to also be sterile, so wearing the gloves and clean to do that?

BENNION: Yes.

MYERS: And can you recall -- I'm going to ask who it was, which nurse was wearing that type of equipment and ready to do the procedure.

BENNION: No, I can't recall.

MYERS: You can't? If I suggested to you or ask you, was it Nurse Taylor, can you remember that or not?

BENNION: I can't remember.

MYERS: The procedure took place with 10% glucose going through the line, didn't it?

BENNION: Yes.

MYERS: You were tending to [Baby B] when the problems began with [Baby A]?

BENNION: Yes.

MYERS: You recall Ms Letby asking for help?

BENNION: Yes.

MYERS: Just pausing there, in general is that what a nurse will do, if they decide there is a situation that's developed where there has to be a response quickly?

BENNION: We have an emergency buzzer that could be pulled. However, as there were lots of staff in that room and the unit is so small, it's quite appropriate to shout, "Can I have some help please?"

MYERS: It might be something we hear as we go on in the trial, but a nurse shouting, "Can I have some help, please", is what a nurse would shout in that situation?

BENNION: That's appropriate to ask that.

MYERS: Also present in that nursery was Dr Harkness?

BENNION: Yes.

MYERS: Obviously you, Ms Letby, Melanie Taylor?

BENNION: Yes.

MYERS: Can you recall whether there were other people?

BENNION: I can't, no.

MYERS: You assisted with what followed, didn't you?

BENNION: Yes.

MYERS: And in fact one of the things that you did at that stage was to take notes of what was happening in the course of the resuscitation, didn't you, noting dosages and times, things like that?

BENNION: I was tasked or took it on myself to draw up the emergency drugs. Then I wrote down the times and the dosage of the drugs that I passed to the doctors to administer.

MYERS: Right. And this is all happening as it unfolds?

BENNION: Yes.

MYERS: Where would you write down the dosages and the times in that situation? What would you write them on?

BENNION: Probably just on the back of my handover sheet that I'd written my information that I had taken from my day staff handover --

MYERS: Okay.

BENNION: -- or a piece of paper that was in the trolley.

MYERS: I'm going to move on, just briefly, to what happens afterwards. In the event of -- the very sad event of a death there's a set procedure on bereavement for the parents, isn't there?

BENNION: Yes, there is.

MYERS: And as far as you and your colleagues are able, you attempt to give emotional and practical support?

BENNION: Yes.

MYERS: It can be a difficult situation for everybody to deal with, can't it?

BENNION: Yes, very difficult.

MYERS: We've heard, we may hear some more, there are things the nurses can do with the consent of the parents to look after them and to give them a memory box and memories of the baby?

BENNION: Yes.

MYERS: As for the nurses, at the time we're talking about when you were dealing with this and others, was there any particular formal support for the nurses who dealt with a situation like this?

BENNION: There was no formal support, but within the unit we were very supportive of each other, but there was no formal support.

MYERS: That's what I wanted just to ask you before I finish. As between the nurses, you would try to support one another, wouldn't you?

BENNION: Yes, we would.

MYERS: And so if you saw one another, you'd give one another support?

BENNION: Yes, we would.

MYERS: And you might text or message one another, talking about what had happened and giving one another support in that situation?

BENNION: I don't know if you'd text somebody to give them support. But I personally wouldn't text anybody to give them support. If I saw them on duty or I knew they were coming in the next day, I would go to them personally and ask if they were okay. What we did also try and do was a debrief at the end of a shift and as a shift leader I would make sure -- it wasn't anything formal, if we'd had a dreadful night and we'd had a bereavement, I'd make sure everyone had had a drink and everybody had eaten and everybody was going home feeling as if they could talk about it before they went home, just to make sure that they had anything they wanted to get off their chest before they left the building. But there was no formal form to fill in or any procedure to refer anybody to.

MYERS: All right. To a large extent did the nurses have to really just get on with it themselves and deal with it as best they could?

BENNION: I think it would be fair to say that, under the direction of the medical staff as well, a debrief would always be offered. And we have a very supportive management team. They would offer any support or if somebody felt they didn't want to go back into nursery 1 and have a lighter load, if that was possible, that would be given. So within the network of our close unit, that would be offered.

MYERS: For the nurses themselves, you or colleagues would have to, in effect, be professional, get back to work, if you could, and get on with the job?

BENNION: In reality, you still have the care and the safety of the other babies to look after. Although you yourself have gone through a tragic event, you have to remain professional and provide that care to the allocated babies that you've been given.

MR MYERS: Yes, thank you. Those are my questions, Mrs Bennion, thank you.

Re-examination by MR DRIVER

MR DRIVER: May I just return to two issues raised during my learned friend's questions. Firstly, you will recall being asked about the duration, the time taken for you or other nurses to take certain measurements and make certain observations. And then you were taken to the corresponding records and you were shown an example where it would appear that you had recorded

taking two sets of observations for different babies at the same time. Do you remember --

BENNION: Yes.

DRIVER: -- seeing that example? Would you actually take observations of two different babies simultaneously, at the same time?

BENNION: No, you can't do them simultaneously because you're concentrating on one baby. It's just that you may have documented it at that time. If it was a crucial thing to document, like a medication, you would try and do that on time, but in reality when you've got a baby to look after, you'll do it to the best of your ability to be accurate with your timing.

DRIVER: Would you or do you finish off the set of observations for one child before beginning the observations of another?

BENNION: Yes.

DRIVER: So that's one issue that I wanted to deal with.

Earlier in his questioning of you, my learned friend Mr Myers established your long experience within the specialty and asked you to confirm that premature neonates are inherently vulnerable.

BENNION: Yes, that's correct, they are.

DRIVER: And you confirmed that, tragically, but perhaps inevitably, prior to the death of [Baby A] you had witnessed during the course of your profession other collapses, deteriorations and deaths.

BENNION: Yes, I have.

DRIVER: You confirmed examples whereby a baby, who it was being planned might be ready to be discharged soon, may deteriorate?

BENNION: Yes.

DRIVER: Or babies who seemed well and prospering on one shift might then deteriorate on the next?

BENNION: Yes, that's possible.

DRIVER: Do you remember that?

Turning to [Baby A], the speed and the nature of his deterioration, was that typical of those previous experiences that you were asked about or not?

BENNION: It was very rapid, his deterioration, very sudden. Sometimes there is an indication that you are going to have a deterioration. I always say it's like building a jigsaw and you're pulling in your observations, you're pulling in your records, and there was no evidence that [Baby A] was going to deteriorate. However, it has happened and it can happen.

MR DRIVER: Thank you. Does your Lordship have any questions for the witness?

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

Is this witness going to be required again?

MR DRIVER: At a later date.

MR JUSTICE GOSS: Yes, I thought so.

That completes your evidence for the time being, for today, but you will have to come back on another date later in the trial. I think you were aware -- you'd been made aware of that anyway. Obviously, you will, I hope, receive as much notice as possible of that so that arrangements can be made. But in the meantime, it is vital, as you have probably been told, but I shall tell you in any event, you must not speak to anyone about this case or anything to do with this case at all, anyone involved, until it's all over.

BENNION: Yes, of course.

MR JUSTICE GOSS: Thank you very much. You'll understand the reasons for that. Thank you very much. Just stay where you are for the moment. Thank you.

Could I just ask, Mr Johnson, what we're going to do? We'll have to have a break now.

MR JOHNSON: Yes.

MR JUSTICE GOSS: There is more?

MR JOHNSON: We do have another witness. We don't believe she'll complete today, so if your Lordship wants to make a start, we can.

MR JUSTICE GOSS: We might as well make a start.

This witness will or will not be screened? Will be screened? So it'll take a bit of time to swap the witnesses round. All right.

A short break for you, members of the jury, and then we'll do about another hour this afternoon.

(In the absence of the jury)

It'll be between 10 to 15 minutes. I should imagine more like 10, but I just don't know.

MR MYERS: My Lord, yes.

MR JUSTICE GOSS: I'm just indicating to the prison staff.

I'll rise.

(3.02 pm)

(A short break)

(3.11 pm)

(In the presence of the jury)

[Nurse A] (affirmed)

Examination-in-chief by MR ASTBURY

MR ASTBURY: Can we start with your full name, please?

NURSE A: [Nurse A].

ASTBURY: Thank you, [Nurse A]. It's right, I think, that you've got a nice loud voice, you're projecting. Although I'm asking the questions, if you can try to project your voice to the back row of the jury, so we know that everyone who needs to hear you can hear you, all right?

It's right, I think, that you are qualified as a band 6 senior neonatal practitioner?

NURSE A: Yes.

ASTBURY: And you have been for some years?

NURSE A: Yes.

ASTBURY: All right. I'm going to ask you some questions shortly about a period between -- well, in June of 2015. You were employed in that role at the Countess of Chester Hospital,

certainly in the period that we'll be interested in, which is June 2015 right through until at least June of 2016.

NURSE A: Yes, that's correct.

ASTBURY: All right. You qualified in 1992?

NURSE A: Yes.

ASTBURY: I think you completed your neonatal intensive care and advanced practice qualifications in 2004.

NURSE A: One in 2004 and then the enhanced one was a little bit later.

ASTBURY: So you've been qualified to this level for some time?

NURSE A: Yes.

ASTBURY: I want to ask you specifically, please, about the period when you were employed at the Countess of Chester Hospital.

NURSE A: Yes.

ASTBURY: First of all, staffing levels. How would you describe staffing levels in the period you were there?

NURSE A: There were definitely periods when we were short-staffed --

ASTBURY: Right.

NURSE A: -- periods when we were okay. We didn't always meet the BAPM recommended staffing levels.

ASTBURY: Okay.

NURSE A: You know, there were shifts that were too short-staffed and...

ASTBURY: Okay. What was done on those occasions when shifts were short-staffed to try and tackle the problem?

NURSE A: You might look at shifts further on the rota -- sorry.

MR JUSTICE GOSS: It's all right, don't worry. It often happens.

NURSE A: You might look at shifts --

MR JUSTICE GOSS: Just pause for a moment.

MR ASTBURY: There's absolutely no rush.

(Pause)

MR ASTBURY: It may be, I know you've got a file open in front of you. If you'd like to close that over and put that to one side as well, I don't think we're going to need that. We can always get it out if we need it, but that's another obstruction we can move out of the way. So clear the decks.

I'd asked you what type of things would be done on those occasions when it appeared that a shift might be a bit short.

NURSE A: So you may look at shifts further on, on the rota, where there was room to move, to ask staff to swap to a shift that was short.

ASTBURY: Okay.

NURSE A: If there wasn't any -- you know, any room for manoeuvre that way you would see if anybody could do an extra shift to cover the shift that was particularly short.

ASTBURY: Right.

NURSE A: You may, if that wasn't possible, may look at bank nurses or agency, but that didn't happen very often. We tended to do extras.

ASTBURY: Okay. So extra shifts?

NURSE A: Yes.

ASTBURY: Perhaps people moving, being flexible with the rota?

NURSE A: Yes.

ASTBURY: And that's how you'd get round those difficulties?

NURSE A: Yes.

ASTBURY: Presumably to make sure that the unit was manned properly?

NURSE A: Yes. You'd staff to a required level and then if you had a few admissions you needed more on a shift than expected then --

ASTBURY: Okay. The jury has heard a little bit about the various levels of neonatal unit. There are three levels. And at the time that we're interested in, Chester was a level 2?

NURSE A: It was, yes.

ASTBURY: And I don't think this is controversial, that meant that generally, Chester could accept babies at 27 weeks gestation and above?

NURSE A: Yes.

ASTBURY: But obviously, things didn't always work out as planned, but that was the general rule?

NURSE A: No. If a baby -- if a mum came in and needed to deliver before she could be moved with the baby still in utero, and it was before that time, then the baby would be moved --

ASTBURY: Yes.

NURSE A: -- after.

ASTBURY: Okay. Shift times typically were 7.30 until 8 on days?

NURSE A: Yes.

ASTBURY: And 7.30 until 8 on nights?

NURSE A: Yes.

ASTBURY: Obviously the other end of the clock. But that's generally what it was and there would be an overlap between the two shifts, both at the beginning and at the end?

NURSE A: Yes.

ASTBURY: We've heard a little bit about the handover process. There'd be a huddle with the new shift, is that right, to discuss general matters?

NURSE A: Yes. We'd get a handover sheet that had the baby's name, basic details, gestation, born at, days old, who was looking at it for that shift, and a summary of how the baby was at that point in time. Then at the bottom there might be points of information that we needed to know, new policies to go and look at or -- you know, safety briefs, we used to call them.

ASTBURY: So that was as a team. Then we understand that individual nurses would go to their allocated baby and would

have a more, if I can put it this way, detailed handover from the preceding designated nurse?

NURSE A: Yes, and the team leaders would have a more detailed one-to-one about all the babies, so the team leader would, I think -- the team leaders were what they call them where I am now, shift leader, whatever --

ASTBURY: Okay, all right. Did you ever work as a team leader on the shifts at Chester?

NURSE A: Yes.

ASTBURY: We've heard about the different types of nursing levels, there would be level 4s, who I think would be nursery nurses?

NURSE A: Yes.

ASTBURY: Level 5s, who would either have specialty or not, and then level 6s like yourself. All right. Who would allocate babies for each shift?

NURSE A: Typically it would be the team leader on the shift that was going off, so they'd look at who was coming on, what the babies were requiring, and allocate appropriate --

ASTBURY: So it wouldn't be the shift leader coming on, it would be the preceding leader knowing who's going to come on and allocating resources accordingly?

NURSE A: Yes. So when you came in, you (inaudible: coughing).

ASTBURY: Okay. Again, I don't think we need to go through this in any more detail, but there were effectively four nurseries: nursery 1, which was of the intensive care room; nursery 2, which was the high dependency room; and 3 and 4 which we have heard described as growing rooms.

NURSE A: Yes.

ASTBURY: Would that be fair?

NURSE A: Yes, special care, yes.

ASTBURY: All right. Was there a distinction between day shifts and night shifts as far as busyness was concerned?

NURSE A: Day shifts tend to be busier in some ways because there's more staff around, so routine investigations, routine procedures, ward rounds, there's more visitors. In terms of what

the babies needed, then that could be the same, but the non-urgent stuff, non-urgent things, examinations could be -- they'd tend to do those in the day --

ASTBURY: Right.

NURSE A: -- so they could be quieter in that sense.

ASTBURY: Okay. So do we take it then if the days were busier for all those reasons, the nights were quieter?

NURSE A: Yes, but not necessarily in terms of admissions and, you know, if a baby needed immediate attention.

ASTBURY: As many parents around on a night shift as there would be on a day shift?

NURSE A: No, it was open for visiting for parents, so some of them would stay quite late into the evening, if babies had been on the unit for a while and the dads had had to go back to work, they might come in after work and then go -- we even had dads come in before work. But generally, no, there was -- there were few parents and for the large part just the nurses and nursery nurses because the doctors cross-covered, so they may have been over on the paediatric ward or in A&E.

ASTBURY: The babies were monitored on the unit?

NURSE A: Yes.

ASTBURY: Various things monitored and if those features being monitored fell below certain levels we have heard there would be alarms that would activate?

NURSE A: Yes.

ASTBURY: Was there more than one type of alarm?

NURSE A: Yes. The monitors had three different types of alarms. So for various reasons, you'd have an upper limit and a lower limit, so whichever aspect that was, you'd set limits, so if... If... If that parameter went above, you'd get an alarm that sounded one way. If things started dropping, there was like a preliminary alarm, so if it dropped within a certain amount below the alarm limit, and then if it dropped below another amount you got a more urgent alarm. So there were different tones.

ASTBURY: So urgent alarm and more urgent alarm, would that be a fair way to put it?

NURSE A: Yes.

ASTBURY: It might sound a daft question, but if an alarm went off, what would a nurse be expected to do?

NURSE A: Go to the baby if possible.

ASTBURY: Okay.

NURSE A: I say "if possible", because you might be doing something else, but look to see what parameter was alarming, how the baby was looking --

ASTBURY: Okay.

NURSE A: -- pay attention.

ASTBURY: Assess the situation?

NURSE A: Yes.

ASTBURY: All right. And if there was something wrong, what would you expect the nurse to do?

NURSE A: Deal with it --

ASTBURY: Right.

NURSE A: -- appropriately.

ASTBURY: On their own?

NURSE A: It would depend what was going on, which alarm, why the alarm was going off. So there's not one straight answer to that. It would depend for the reason that --

ASTBURY: Would a doctor be immediately called --

NURSE A: Not necessarily, no. It would depend.

ASTBURY: So would the nurse try and resolve it first?

NURSE A: Yes.

ASTBURY: Okay. Now, I want to ask you questions specifically, please, about two babies on the unit today. First of all, [Baby A].

NURSE A: Yes.

ASTBURY: And in particular, events on 8 June 2015. You were on a night shift on that particular day; is that right?

NURSE A: I was, yes.

ASTBURY: And you would have come on duty, as we covered before, at about 7.30?

NURSE A: Yes.

ASTBURY: If we could just go, please, to the sequence of events, please, for [Baby A].

If we can begin, please, with number 163 on the timeline. If we look at that tile you'll see -- you'll not have seen this before, but that is, on our sequence of events, an indication of the time you arrived on shift that particular day.

NURSE A: Okay.

ASTBURY: We can see at 7.31 -- did you have a swipe to get through the doors?

NURSE A: Yes.

ASTBURY: And we can see:

"Maternity neonatal entrance doors (in)."

If we can move next, please, to tile 161, back a little bit in time. If we can go behind that, please. So we can see there the consultants on duty, the doctors, and if we look at the nursing staff and, as you recalled on occasions, you were a shift leader. Do you remember that particular shift?

NURSE A: Very clearly. Well, part of it very clearly.

ASTBURY: All right. And do you recall that you were shift leader?

NURSE A: Yes.

ASTBURY: Those designations, you told us, would have been allocated by the shift leader on the day shift?

NURSE A: Yes.

ASTBURY: Okay, all right. We've heard the type of checks that are taken by designated nurses. What would your role have been without a designated baby?

NURSE A: So you have a full handover from a team leader, so more in-depth details about all the babies on the unit. It'd be handed over if there were any issues with maybe equipment or staffing on upcoming shifts or, you know, a general overview. Then there were certain checks that were done in the earlier part of the night that the team leader would do some of, but I didn't have specific safety checks to do immediately on a baby's bed space.

ASTBURY: Okay. Do you remember how that shift began for you?

NURSE A: Yes. Well, I don't remember handover. I know it will have happened, but it was unremarkable in that there was no -- but yes, I remember the events shortly after 8 o'clock.

ASTBURY: Tell us then, please, what you remember shortly after 8 o'clock?

MR JUSTICE GOSS: Sorry, just before we go on, maybe I misheard you and/or the witness earlier. You appeared to be the designated nurse for number 7.

NURSE A: I can't see down that far.

MR ASTBURY: My Lord --

MR JUSTICE GOSS: Am I on the wrong sheet then?

MR ASTBURY: Possibly. 8 June, Monday, 7.30. It should be the staff rota.

MR JUSTICE GOSS: "Shift handover: baby allocation."

MR ASTBURY: We haven't looked at that tile yet, sorry.

MR JUSTICE GOSS: I'm sorry.

MR ASTBURY: We are only looking at the staff at the moment (overspeaking). I was about to look at it, apologies.

MR JUSTICE GOSS: Yes, I'm looking at my --

MR ASTBURY: I understand, thank you.

If we could go then back, please. I think it's --

MR JUSTICE GOSS: Sorry, I wasn't -- it was my mistake.

MR ASTBURY: If we can go back, please, Mr Murphy, to the next tile. I think that's what his Lordship was referring to.

NURSE A: Oh, okay.

MR ASTBURY: We can see there a list of babies --

MR JUSTICE GOSS: I think the witness said not having a baby.

MR ASTBURY: Yes, that's right. Your Lordship is quite right.

NURSE A: Well, I did have babies.

MR ASTBURY: Thank you. And we can see from that list, we don't need to know the names of the babies, but we can see you allocated to EB about halfway down the page.

MR JUSTICE GOSS: And number 11, 7 and 11.

MR ASTBURY: Seven and 11, thank you.

So you would in fact have done the types of checks that you told us about would be done at the bedside --

NURSE A: I would have indeed done those and handover on those two.

ASTBURY: You were about to go on and tell us about events shortly after 8 o'clock that you do remember.

NURSE A: I haven't seen that before.

ASTBURY: Okay.

NURSE A: I don't know how that list order's come up, but I would expect they were both stable special care babies, just requiring feeding and four-hourly observations rather than constant monitoring.

ASTBURY: Right --

NURSE A: Because (overspeaking) --

ASTBURY: -- to enable you to have that shift leader role as well?

NURSE A: It would be usual in that situation, because that does happen at times when units are busy, that they'd be babies that were in a room with other babies, so if I had to leave the room, there were other staff present to keep an eye.

ASTBURY: Sorry that was my fault and you've been interrupted when I had just asked you about the events that you told us that were very much fresh in your memory shortly after 8 o'clock.

NURSE A: I know I'd actually left the unit briefly, I think to go to the staff toilets, which were allocated just outside the unit --

ASTBURY: Right.

NURSE A: -- doors. And I remember, because when I came out, when you look towards the unit doors, they have glass panels in and you look straight down the corridor to the intensive care nursery. And I could see the incubator that [Baby A] was in and I could see that Dr Harkness was now standing by that incubator and there were other, you know, other nurses around too. And I was like, oh, something's happened, so I hurried back in there to see.

ASTBURY: Had you passed through the doors at this point when you saw Dr Harkness?

NURSE A: I was moving towards the doors as that was -- as I say, I could see him when I came. So I knew that when I'd left the unit he'd actually been with [Baby A]'s sister, [Baby B].

ASTBURY: Right.

NURSE A: That was the incubator he was at, in sterile gowns, putting a long line in.

ASTBURY: Okay. So you remember going through the doors and seeing this unfolding as you went through the doors?

NURSE A: Yes, as I approached the doors, because there were glass panels in them.

ASTBURY: If we could just go to tile number 180, please. We looked at the data before about you coming on duty. This is --

NURSE A: That's me coming back on to the unit (overspeaking) --

ASTBURY: This appears to be you coming back into the neonatal at 8.20 according to the fob.

NURSE A: Yes.

ASTBURY: Is that consistent with your recollection?

NURSE A: Yes.

ASTBURY: So having seen Dr Harkness at the side of the cot -- whose cot was at the side of, remind me?

NURSE A: [Baby A]'s.

ASTBURY: What did you think at that point?

NURSE A: Well, it was -- with my experience, as I was walking in, I was thinking, oh, he's, you know, had some sort of episode -- babies can have bradycardias, desats, desaturations of oxygen levels, even become apnoeic, so I was thinking something like that had happened.

ASTBURY: Okay. And do you remember anyone else who was present other than Dr Harkness?

NURSE A: Lucy Letby and Caroline Bennion were both there.

ASTBURY: All right.

NURSE A: And Mel Taylor was in the room as well.

ASTBURY: Okay. I think you provided the police with a plan of your recollection of where people were standing.

NURSE A: I did.

ASTBURY: I wonder if we could just have a look at that, please, Mr Murphy.

If it's possible, if we could zoom in on the -- okay. We've seen the plan. We've zoomed in a little bit on nursery 1. Is that the room we're talking about?

NURSE A: That is the room we're talking about.

ASTBURY: And can you just tell us what your marks mean? I can see something written in the bottom corner of the box that's "room 1". Do you know what that says?

NURSE A: Um...

ASTBURY: No, you can't read that?

NURSE A: No.

ASTBURY: What we can see above is "[Initials of Baby B]"; what does that denote?

NURSE A: The sort of rectangles are where we had incubators. So that's a cot space. So "[Initials of Baby B]" is [Baby B].

ASTBURY: If we work anticlockwise, we can see -- there's another rectangle with -- can you tell us what that's got written inside?

NURSE A: [Initials of Baby A] for [Baby A].

ASTBURY: Okay. And to the right of that is written?

NURSE A: "Dr Dave", so Dr Harkness.

ASTBURY: Okay. And if we carry on in anticlockwise, there are two more of those rectangles drawn, what do they --

NURSE A: They are incubator spaces which I couldn't recollect, at the time of my interview, whether they had babies in them or not.

ASTBURY: And finally we've got what looks like an asterisk towards the centre.

NURSE A: Yes and says "resus". So that's where the resuscitation trolley was kept.

ASTBURY: Okay. What's the resuscitation trolley?

NURSE A: The resuscitation trolley is the emergency equipment trolley so that if a baby became unwell you had everything in there so the baby could be intubated, emergency lines put in, there were emergency drugs in there -- basically a small number of all the equipment you might need in an emergency. We used to take it through to delivery with us as well if there was a high-risk delivery.

ASTBURY: It's obviously on wheels and can be taken wherever it's needed?

NURSE A: Yes.

ASTBURY: All right. Okay. So did you go into nursery 1?

NURSE A: I did.

ASTBURY: Tell us, please, what you saw when you went into nursery 1?

NURSE A: So they were using the Neopuff to give [Baby A] breaths and it became evident to me that sort of he'd suddenly become apnoeic and his heart rate had dropped and his saturations levels had dropped.

ASTBURY: Okay. Apnoeic?

NURSE A: Stopped breathing.

ASTBURY: Okay. So stopped breathing and you could see this on the monitors?

NURSE A: I could see this on the monitor as well. So I can't remember who, but somebody will have said that, you know, it happened suddenly, that... I know Lucy Letby was his named nurse and she had asked for more help and then sort of -- so Caroline and Dr Harkness had come over when it became obvious she needed more help. And then the resuscitation unfolded from there.

ASTBURY: Okay. Can you remember who was doing what amongst the team?

NURSE A: So Dr Harkness intubated [Baby A], so that's putting the endotracheal tube in. And then continued to give him breaths via the Neopuff system. I know I -- I can't remember if I was the first person to start the chest compressions, but I do know for a considerable part of the resuscitation we... They turn a baby, instead of lying straight in the incubator, they'll turn them 90 degrees so that they can intubate them, have a clear view to put the tube in. So once we got the tube, we turned him back --

ASTBURY: Can I just ask you to pause there. So we've got this image of a rectangular incubator?

NURSE A: Yes.

ASTBURY: How would a baby normally lie in that rectangle?

NURSE A: So head and feet at the (overspeaking) --

ASTBURY: There are two ends --

NURSE A: -- long end and the side. So you can turn the baby on the mattress --

ASTBURY: Right.

NURSE A: -- so that the head would then be towards somebody standing at the side of the incubator so that they can look with a laryngoscope and (overspeaking) --

ASTBURY: And is there anything about the incubator that makes that easier or --

NURSE A: The bed can be slid out from under the lid and the lid can even be taken off if need be.

ASTBURY: All right.

NURSE A: So he had been intubated and I know we turned him back round because I was standing at the foot of the incubator -- I had dropped the door down in the solid end of the incubator because I had my hands through there doing the chest compressions.

ASTBURY: Okay. So where's the opening in the incubator where you put your arm, just so I can follow?

NURSE A: At the bottom, what would be the foot end, so out towards the room.

ASTBURY: Okay, right. You are -- you held your hands up in a particular way. Yes. Just show us again, please, how you would -- so you were physically holding [Baby A]?

NURSE A: I had my hands round his chest and my thumbs on his sternum area, because that's the most effective way to give chest compressions. So I was -- because we had turned him back round so that people could access him from both sides of the incubator, rather than how we had him to put the tube in, it meant that Dr Harkness was -- if I am at the foot of the incubator, Dr Harkness was on my right doing the Neopuffing and it meant people could access on both sides to administer drugs --

ASTBURY: Okay.

NURSE A: -- and things.

So the foot of the incubator has a door in it, so I'd dropped that and I was leaning, reaching through at the bottom, because then I could have my hands in the right position.

ASTBURY: Do you remember who was administering the drugs?

NURSE A: Um... I know... Um... I can't remember who'd come in to prescribe. I know -- I know that Caroline and Lucy and Mel were all there. I can't physically remember who actually came and gave the drugs (inaudible).

ASTBURY: All right.

NURSE A: Because I was -- the drugs were being drawn up behind me because I'm looking at [Baby A], facing the wall.

ASTBURY: Okay. So you've actually got hold of [Baby A]. How did he look?

NURSE A: Um... I'd never seen a baby look that way before. I mean, he looked very ill, but he had a discolouration pattern that I've never seen before.

ASTBURY: Okay. Let's pause there. I'm going to ask you then to describe that discolouration pattern for me, if you can.

NURSE A: So he was very white with sort of purply blotches.

ASTBURY: Okay.

NURSE A: He did look cyanotic as well.

ASTBURY: Sorry, that was?

NURSE A: Blue, dusky.

ASTBURY: "Cyanotic" was what you said?

NURSE A: Yes. But it was this purply blotchiness with white that I'd not seen before.

ASTBURY: Okay. Where was that?

NURSE A: Over his body.

ASTBURY: Can you tell where in particular on his body it was?

NURSE A: No, not for certain. My recollection was it was over him, you know, everywhere, maybe more torso -- no, I can't remember clearly. But I just (inaudible: coughing) unusual.

ASTBURY: Anything else you can tell us about that discolouration, anything that sticks in your memory?

NURSE A: It had come on very suddenly -- just how unusual it was.

ASTBURY: Right. So did [Baby A] respond to your efforts at CPR or the medication he was receiving?

NURSE A: No.

ASTBURY: You told us Dr Harkness was there?

NURSE A: Yes.

ASTBURY: Was anybody else summoned?

NURSE A: Yes, other doctors came in. I... I didn't recall from memory, but I knew other doctors had come in. I do know who it was, but -- I knew there were doctors there, I do remember Ravi Jayaram, Dr Jayaram, coming in. I can remember where he was standing.

ASTBURY: Was that a request for help, was it?

NURSE A: Yes.

ASTBURY: Do you know who made that request?

NURSE A: I don't know who put the call out, the emergency call out, because Dr Harkness was in the room, so when [Baby A] first didn't respond to Lucy and she asked for help, in fact the registrar was right there, so actually I don't think the call went out as quickly as it -- not that there was a delay because he was already there, so I think the call went out when it became evident that Dr Harkness needed more people, more doctors there...

ASTBURY: And how would that call for help go out?

NURSE A: From the telephone. You dial --

ASTBURY: Is there a system?

NURSE A: Yes, there was a specific number that you dialled that went to a specific phone in switch --

ASTBURY: Okay.

NURSE A: -- so that they would all answer it quickly and then you gave -- it was just "neonatal emergency" and the room. And then that's a spoken -- rather than it just being a bleep, it's actually spoken out loud.

ASTBURY: You were telling us, were you, who then came?

NURSE A: Dr Jayaram, who was the consultant on that night, and I believe Rachel Lambie came well and that Dr Wood was there.

ASTBURY: We'll just have a quick look at 197, please, on the sequence of events. That suggests that Dr Jayaram arrived at 8.30.

NURSE A: I -- yes.

ASTBURY: So we can work out that's 10 minutes -- you swiped in at 20 past, he swipes in at --

NURSE A: Yes.

ASTBURY: So we're talking about 10 minutes?

NURSE A: Which is a reasonable response because we had a registrar there, so we were treating, and, you know, it will have taken -- I don't know where Dr Jayaram was at the time he got the call, so...

ASTBURY: All right. Because of what was happening with [Baby A], was a decision made about his parents?

NURSE A: At the same time that the emergency call went out, I think somebody went to get his parents from -- to come to the unit.

ASTBURY: Do you know where they were?

NURSE A: I can't honestly remember if at that point mum was still on delivery suite or if she'd gone up to the post-natal ward. I know it was one or the other.

ASTBURY: Once Dr Jayaram had arrived, can you tell us what went on once he'd arrived?

NURSE A: So we continued with the full resuscitation and gave resuscitation medications as well. I know Dr Jayaram spoke to the parents, he... From what I recall, he was standing on my right, the parents were to the right side of the incubator as well, and he was overseeing the resuscitation. And we gave several rounds of adrenaline and each time you give it, you pause and someone listens to see if we've got a heart rate and we didn't ever hear -- well, we did hear one, but not for long and not very fast.

ASTBURY: Apart from that, I think we've heard a little bit about that, but apart from that did [Baby A] respond to the treatment that you were giving him?

NURSE A: Not at all.

ASTBURY: And did there come a point when Dr Jayaram spoke to the parents?

NURSE A: Yes. I didn't hear the exact conversation, but he -- I know he was speaking to the parents, so...

ASTBURY: Okay. Tell us about the parents at this stage.

NURSE A: So mum and dad, [Mother of Babies A & B] and [Father of Babies A & B], were there and grandma, grandma was with them as

well. And I know that towards the end of the resuscitation, after Dr Jayaram had spoken to them, mum was crying and just saying, "Please don't let my boy die".

ASTBURY: Did there come a point where treatment was stopped?

NURSE A: There did, yes. Sadly, in a resuscitation, if a baby's not responding after a certain length of time, despite everything, then you have to stop.

ASTBURY: Okay. So what then followed at that point when resuscitation had been stopped?

NURSE A: So a lot of people would leave the room. There was quite a large number of people in the room at that point in the resuscitation. You've got somebody documenting what's happening, you've got somebody prescribing drugs, you've got people drawing up drugs. You know, there's a lot of people in the room. So everyone that could would leave.

ASTBURY: Okay.

NURSE A: And then usually, the nurse looking after the baby, the designated nurse, and maybe one other, possibly the consultant, would stay a little longer and we'd disconnect the lines and tubes that we could and pass the babies to the parents to --

ASTBURY: You can't disconnect all lines then, is that right?

NURSE A: We didn't remove lines. We left lines in because it -- it was very sudden and very unexpected. So at that time, the decision was made to leave lines in because we didn't know whether the coroner would require a post-mortem or not. So we disconnect lines but we actually left -- you know, we disconnect them and cap them off as close to the babies --

ASTBURY: But they're left in situ?

NURSE A: Yes.

ASTBURY: All right. You told us that everyone who can leave leaves in the aftermath. Were you one of those who had to stay or did you leave?

NURSE A: I can't actually remember that. I know -- I remember being outside the room, but I can't remember how quickly after that I left or whether I stayed to support Lucy for a little while.

ASTBURY: Did you have a conversation with Lucy afterwards?

NURSE A: Yes.

ASTBURY: Did you discuss any steps that might be taken in the immediate aftermath?

NURSE A: I think Lucy -- well, I know Lucy said to me that, you know, the fluids had only just started, we need to keep the bag.

ASTBURY: Okay. Do you know whether that was actually done?

NURSE A: I don't.

ASTBURY: We've heard that in the aftermath of the baby's death, there is a memory box prepared. Did you play any part in that?

NURSE A: I don't actually recall. My memories of the actual resuscitation have always been very clear, even before my first interview, but not --

ASTBURY: Okay.

NURSE A: I may have done, I may not have done.

ASTBURY: Okay. You continued for the rest of the night shift thereafter?

NURSE A: Yes.

MR ASTBURY: My Lord, I'm about to move on to the following night. I wonder whether that might be a suitable point.

MR JUSTICE GOSS: Yes, it will take some time, will it?

MR ASTBURY: I can do some of it, but I just wondered whether -- we had an early resumption. I can carry on if my Lord wishes.

MR JUSTICE GOSS: No, I think that'll do for this afternoon.

I'm afraid it's not going to be possible to complete your evidence this afternoon.

NURSE A: I was expecting that.

MR JUSTICE GOSS: You'd probably been told that. An appropriate moment has to be chosen because the questions are now going to turn to [Baby B], so it's a sensible place to break off. Can you come back to continue on Monday morning, please --

NURSE A: I can.

MR JUSTICE GOSS: -- at 10.30? In the meantime, obviously don't talk to anyone about your evidence, this case or anything to do with it.

NURSE A: I won't.

MR JUSTICE GOSS: Just stay there for the moment, please.

All right, members of the jury, 10.30 on Monday morning, please. Thank you very much. And remember your obligations, similarly: no conversations with anyone, no research.

(In the absence of the jury)

MR JUSTICE GOSS: Mr Astbury, is there someone to look after the witness?

MR ASTBURY: Yes, there is, thank you.

MR JUSTICE GOSS: As soon as I've risen, the court should be cleared and that person should come and assist the witness. Thank you very much.

(3.56 pm)

(The court adjourned until 10.30 am on Monday, 24 October 2022)