

12 December 2022
Baby G

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Monday, 12 December 2022
(10.28 am)

(In the absence of the jury)

Housekeeping

MR DRIVER: My Lord, just before the jury come in, could I raise a matter that's been raised with me this morning for the first time, please.

MR JUSTICE GOSS: Yes, certainly.

MR DRIVER: Nurse Christopher Booth is anticipated to give evidence later this morning. We've been handed a statement in support of an application for screens in his particular case. He hasn't yet given evidence, I haven't handed the statement up because I haven't yet shown it to the defence.

MR JUSTICE GOSS: Right. Show it to Mr Myers first.

MR MYERS: We've had a copy, my Lord. We've just had it but that's sufficient time.

MR JUSTICE GOSS: Thank you very much.

(Pause)

MR MYERS: We raise no objection, my Lord.

MR JUSTICE GOSS: Thank you very much. Well, I'm satisfied from the contents of the witness statement of Christopher Booth, dated 9 December 2022, that the criteria for the granting of the special measures direction that is sought, namely that he be screened when giving evidence, are met and accordingly I grant the application.

Jury in, please.

(In the presence of the jury)

MR JUSTICE GOSS: Good morning, members of the jury.

Thank you all for coming in today. If any of you don't feel well at any stage, please just make that known to me, but otherwise we'll just proceed as normal.

Thank you very much.

MR DRIVER: May I call Dr Stephen Brearey, please.

MR JUSTICE GOSS: Certainly.

DR STEPHEN BREAREY (sworn)

Examination-in-chief by MR DRIVER

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

BREAREY: Stephen Paul Brearey.

DRIVER: Dr Brearey, during the course of asking you questions, I'll be drawing your attention to some clinical notes that were made by both yourself and colleagues and they will appear on the screen immediately to your right for your point of reference. I know that you will have anticipated you've been invited here today to provide evidence in relation to your involvement with the care of a baby by the name of [Baby G] --

BREAREY: Mm.

DRIVER: -- who I think, this is right, could you confirm, is still a child in relation to whom you have a continuing professional relationship?

BREAREY: That's correct.

DRIVER: We know, and I remind you if I may, that [Baby G] was admitted into the neonatal unit at the Countess of Chester Hospital from Arrowe Park Hospital on 14 August 2015.

BREAREY: That's correct.

DRIVER: Prior to giving evidence here this morning, have you been given and taken the opportunity to remind yourself of the contents of the notes pertaining to her time within the NNU at Chester over the following several weeks?

BREAREY: Yes, I have.

DRIVER: Thank you. Might I ask you to address your answers to the jury to best aid communication.

BREAREY: Okay.

DRIVER: Thank you.

I'm confident I can lead you in this regard. Did you first review [Baby G] on 22 August 2015 --

BREAREY: That's correct, yes.

DRIVER: -- during a ward round?

BREAREY: Yes.

DRIVER: Did you then review her again on 2 September 2015 during your on-call week?

BREAREY: Yes.

DRIVER: Are you able to inform the jury in general terms about how she was on those two occasions and what, if any, developments had occurred during the week and a half or so between reviewing her on your rounds?

BREAREY: Yes. So on the 22nd, she had already been on the neonatal unit for over a week and the general trend was one of improvements. The main medical concerns were her respiratory support; she had chronic lung disease of prematurity. When she arrived to Chester on 14 August, I believe, she was on CPAP, continuous positive airway pressure, and in a reasonable amount of oxygen. By the time I saw her on the 22nd, that had been weaned successfully to humidified high-flow oxygen, Optiflow, and her oxygen requirement had come down a little.

The general impression was one of improvement in her respiratory status and she was establishing feeds.

There had been a long-term issue in terms of her having a full abdomen, which isn't unusual for babies born this early, and I think I prescribed or suggested a prescription for a suppository to help her move her bowels on the 22nd, which was successful. But otherwise there was no changes to her management and no concerns.

Then in September, when I saw her on the Wednesday, I believe, again there was a pattern of improvement.

Her flow rate for Optiflow had come down. Everything was moving in the right direction. She continued to establish enteral feeds and I believe, if it wasn't on that day it might have been later that week, she'd started to take bottles as well as NG feeds.

DRIVER: Thank you. So that takes us into the early part of September 2015. Now I'm going to invite you to focus your attention more specifically on the 6th and 7 September.

To assist you in that regard, we will look at the notes that you and a colleague or two made at around that time.

So if I ask Mr Murphy to put on screen, please, our tile 28. This presentation has been created for the benefit of the jury to provide a chronology of the events and you see your name there and a reference to clinical notes made at 11 am on Sunday, 6 September, and we'll click on and you'll be shown, firstly, a summary of what's contained within your actual notes and then we'll now present the note itself to you.

Do you recognise that as your handwriting?

BREAREY: That's correct, yes.

DRIVER: Thank you. Timed and dated 11 am, 6 September 2015. In what context did you create this clinical note?

BREAREY: It was a Sunday morning. I was the consultant on that weekend and I saw [Baby G] and reviewed her on the ward round, on the neonatal ward rounds. [Baby G] was a corrected gestation of 38 weeks, corrected gestation, so was considered to be term, corrected. And as I have said, the main medical diagnoses were chronic lung disease of prematurity and mild bilateral ventriculomegaly, which is -- the ventricles of the brain were slightly enlarged on cranial ultrasound scans.

DRIVER: Pausing there, so a corrected gestational age because she was in fact born at a gestation of 23 weeks and 6 days as your note informs --

BREAREY: That's correct.

DRIVER: However, 97 days had passed since that event.

BREAREY: Yes.

DRIVER: And therefore adding the two together, she was effectively a term baby by now?

BREAREY: Mm-hm.

DRIVER: Take us through your next recorded note, please.

BREAREY: So systematically, looking at her respiratory or ventilation status, she was on low-flow oxygen, so that's a step down from the Optiflow that she'd been on previously. And she was receiving 0.06 litres a minute of nasal cannula oxygen, which is a very small amount of oxygen. The nurses had not reported any significant desaturations, drops in her oxygen levels, from the notes that I reviewed -- from the nurse notes that I reviewed that morning.

DRIVER: Yes.

BREAREY: From a fluid and cardiovascular point of view she was receiving 180ml per kilo per day of milk. This was mother's expressed breast milk. It was being given via the nasogastric tube in addition to some bottles. So clearly, she was making progress with that if she was taking bottles of milk at that time. And her oxygen requirement was coming down. Things looked quite stable and improving.

DRIVER: Pausing there, can you assist us as to an appreciation of the volume? So 180ml, is that in total per day or is that per kilo of her weight?

BREAREY: It's per kilo of her weight. You can see underneath her weight at the time was 1.985 kilograms, almost 2 kilograms, so she would have been receiving in a 24-hour period roughly 360ml in that 24 hours.

DRIVER: Could you guide the jury as to that weight as per a baby with a corrected gestational age of 38 weeks? Is that around the target weight or is she still a little under?

BREAREY: She was still a little under. It's not uncommon for preterm babies that they -- the target for us is really for them

to catch up some weight so that they end up on a normal centile line and particularly she'd had quite a stormy time at Arrowe Park Hospital. One of the reasons that she's on 180ml per kilogram per day was -- the normal for a preterm baby at this stage would normally be 150ml per kilogram per day, but clinical staff will often go up to 180ml per kilogram per day to help promote growth when the baby is tolerating the milk and it's beneficial for those babies.

DRIVER: Thank you. I interrupted you. You were telling us that that was 180ml per kilo weight of expressed breast milk.

And then the next line indicates?

BREAREY: So [Baby G] was on Gaviscon and fortifier. So the fortifier is a breast milk fortifier which gives a little extra in the way of calories but also gives some extra vitamins as well. The Gaviscon written in the note there is a reflux treatment to help -- it actually lines the -- it's an alginate that covers the lining of the stomach.

DRIVER: That's input?

BREAREY: Yes. And the output then would be that she was passing urine satisfactorily. She'd opened her bowels. Her weight had increased to 1.985 kilos.

DRIVER: You confirmed a minute or two ago that from a respiration perspective, it was a positive trend?

BREAREY: Mm-hm.

DRIVER: And from a feeding and digestive perspective, how were things going with [Baby G] in the 15 days or so that she'd been under your care?

BREAREY: Still receiving a little more milk than average to boost the calories and her growth, but tolerating this well.

Her gut was clearly working normally because she was opening her bowels and there were no nursing concerns in that respect.

DRIVER: Thank you. Next is a list of meds that she was receiving, some of which you've already alluded to, certainly the Gaviscon.

BREAREY: The Gaviscon I've just mentioned. The two medicines are furosemide and spironolactone, which are both diuretics, which are given, in this case, for chronic lung disease of prematurity and often help reduce the requirement for oxygen for preterm babies. A side effect of diuretics is that you sometimes lose

salts in the urine and that's why [Baby G] was on sodium chloride supplements to treat that.

DRIVER: Thank you. Then on examination?

BREAREY: On examination she appeared pink and well. Her heart sounds were normal. No murmurs were heard. Her chest was clear on auscultation -- that's listening to the chest -- and her abdomen that morning appeared soft.

DRIVER: Thank you. Therefore the plan was?

BREAREY: To continue with establishing feeds, taking more bottles and less NG tubes, that would mean. When babies get close to considering discharge at this term/gestation that she's at, then because she had chronic lung disease of prematurity, she'd be considered as a high risk for RSV bronchiolitis, which is a viral chest infection, so for those high-risk babies, after they go home, they have a monthly injection of palivizumab, which is a type of vaccine to prevent bronchiolitis.

DRIVER: So this was one of the preparatory steps in anticipation of her discharge to home?

BREAREY: Exactly, yes.

DRIVER: Thank you. So that was your examination of [Baby G] and your projected plan as of the morning of 6 September?

BREAREY: Mm-hm.

DRIVER: What was the nature of your duties on 7 September?

BREAREY: I was the on-call consultant that day, so obviously it involves some ward work during the daytime and then I would be the on-call consultant overnight until 8.30 the following morning.

DRIVER: And were you called in in the early hours of 7 September?

BREAREY: I was.

DRIVER: By whom and in what circumstances?

BREAREY: Dr Ventress, the registrar on overnight, called me in at approximately 3.30, I believe.

DRIVER: Thank you. Did you attend at the NNU and did you attend upon [Baby G] at that time?

BREAREY: Yes.

DRIVER: And was Dr Ventress there at your arrival?

BREAREY: She was present, yes.

DRIVER: And were you at that point appraised by Dr Ventress of the events that had caused her to call you in?

BREAREY: She was just at the point of intubating [Baby G] when I arrived, but obviously would have explained things afterwards, yes.

DRIVER: Thank you. I wonder whether Mr Murphy -- there are notes from Dr Ventress and Dr Brearey behind a single tile. Can we go to that rather than hopping about from tile to tile?

We can see notes here made by Dr Ventress which, if we continue to look at them, include reference to the fact that you were called in and appraised of the situation. So you were called in because [Baby G], it was said, had had a very large projectile vomit and you told us a minute or two ago that, at the point of your arrival, [Baby G] was being intubated or Dr Ventress was attempting to intubate [Baby G]. Can you tell us what you recall of the situation upon your arrival?

BREAREY: Well, Dr Ventress explained to me, as you can see in the record, that she'd been called urgently to [Baby G] because she had had this very large projectile vomit, which -- some of it landed on the chair next to the cot as well as the canopy. This seems quite unusual now looking at this in retrospect. It's not something that I have witnessed before.

DRIVER: Pausing there, you have not witnessed any projectile vomiting or this sort of projectile vomiting?

BREAREY: Well, I have witnessed projectile vomiting in babies with other diagnoses, but in a preterm baby like this who's been stable for so long without the diagnosis of something called pyloric stenosis, I haven't witnessed this ever before, no.

DRIVER: Without digressing too far, you said without the diagnosis of?

BREAREY: Pyloric stenosis is a condition that usually affects term babies and is a narrowing in the muscle at the base of the stomach and develops around about 2 months of age and causes classical projectile vomiting. It's clear that [Baby G] didn't have this diagnosis from her history and the lack of vomiting prior to this episode.

So I can't remember -- I haven't mentioned in my statement and I can't remember Dr Ventress mentioning the discoloured purple abdomen, but [Baby G] had -- was known to be having a distended stomach previously on occasion.

DRIVER: Yes.

BREAREY: And Dr Ventress felt in her initial review that [Baby G] was getting back to normal again after the initial call, but then went to the preterm delivery room, was called back urgently when [Baby G] had further -- had a further desaturation and bradycardia, a dropping of the heart rate, and Dr Ventress had made the decision to intubate [Baby G] and had finished intubating [Baby G] or was in the process of that when I arrived.

DRIVER: So just to recap on history, was it relayed to you Dr Ventress was called to look at [Baby G] post the projectile vomit?

BREAREY: Mm-hm.

DRIVER: Shortly thereafter, Dr Ventress was called elsewhere --

BREAREY: Mm.

DRIVER: -- to assist with a delivery and then recalled to [Baby G]?

BREAREY: That's correct.

DRIVER: And it was at that point that you -- or shortly thereafter -- first attended on [Baby G] this morning?

BREAREY: That's correct.

DRIVER: Were you called in from home or were you doing something else within the NNU at that point?

BREAREY: I was called in from home.

DRIVER: Thank you. How was [Baby G] at the point that you encountered her on the early hours of 7 September?

BREAREY: Initially, it appeared from the observations that she had stabilised after intubation. I can see from my statement that I've made a comment about the gas that occurred half an hour after the intubation, which appeared normal, actually. Following from writing this statement, I realised that I was actually called to the preterm delivery that Dr Ventress had been called away from to attend to [Baby G], and that baby was

born at around about 4 am, so there was a period of time when I was in delivery suite attending to that other preterm delivery.

DRIVER: So you came in from home, you went to [Baby G], but at some point thereafter your services were required elsewhere?

BREAREY: I can remember being satisfied that Dr Ventress had the situation in control with [Baby G] once she'd intubated and clearly the monitors were acceptable, you know, the readings, and then I needed to go to the other preterm delivery, on the delivery suite, but I'm aware that a gas was done half an hour later after the intubation and that showed that -- that was effectively normal.

DRIVER: I wonder if we could scroll down to Dr Brearey's contribution to the notes. I'm sorry, having asked you to do that, towards the bottom of the screen we can see Dr Ventress recorded Dr Brearey in attendance.

If we just consider Dr Ventress' note from that point onwards.

BREAREY: Okay. So the ventilator settings, pressure of 18/5, and a rate of 40, and inspired oxygen concentration of 30%, I'd consider to be relatively low ventilator settings, which means at that time [Baby G] wasn't difficult to ventilate and actually when we reviewed the gas 30 minutes after the intubation, we reduced the pressures down to 16/5.

So even within half an hour, her ventilation status was satisfactory, allowing us to wean her ventilation.

DRIVER: Thank you. Then in the chronology we get to 5.30 or thereabouts, as Dr Ventress recorded:

"At approximately 5.30, [Baby G] had another profound desaturation."

Is that the second event that you are referring to?

BREAREY: Yes, exactly. Yes. So her heart rate dropped to 60 and oxygen levels dropped to 40%. On a ventilator, again this is unusual, and I suppose the first question a clinician would ask themselves is: is the ventilator providing the support that we're asking it to provide?

To be completely safe, Dr Ventress took [Baby G] off the ventilator to provide support by a more manual method, using the Neopuff, which is a device to provide pressurised oxygen to [Baby G]. The capnograph was still connected and that was still changing colour, which suggests that the endotracheal tube was still in the correct position. The chest movement was

satisfactory for Dr Ventress, so -- can you just scroll to the top of that, sorry?

So [Baby G] recovered slowly from that desaturation and was reattached to the ventilator. Again, there was some uncertainty at this time regarding the ventilator and it was changed for another ventilator. It would appear that the leak that the first ventilator was alarming to was still present in the second ventilator, which tells me that it wasn't a ventilator problem if a ventilator had been changed and there's still the same issue.

DRIVER: Pausing there if you would for a moment, can you assist the jury as to that issue by defining what a leak is and giving it some context?

BREAREY: Okay. So in adult ventilation, the tube that goes into the trachea, into the airway, has a little balloon around it as it enters the airway to stop any gas escaping so that everything the ventilator puts into the lungs is used to expand the lungs. Those balloons traditionally haven't been used in babies, in preterm babies, because the pressure of the balloon that stops or seals the leak, if you like, can then damage the airway of preterm babies.

So neonates at this time were intubated with uncuffed tubes that would always have some degree of leak. A small degree of leak is fine. A large degree of leak might indicate that your tube is too small and you need a slightly larger tube. But we wouldn't change to a larger tube if the baby was ventilating satisfactorily. So if their chest was moving and the gases were normal, even with a larger leak, you'd still be happy with that and feel that was satisfactory.

DRIVER: Thank you for that. So there was a change in equipment, but a large leak remained, according to the notes. And if that is not a consequence of some flaw in equipment, what's the explanation?

BREAREY: I can't explain that explanation, actually. It's unusual for babies to desaturate on a ventilator, particularly in view of the normal gas that they had or [Baby G] had prior to that. It doesn't -- and the fact that Dr Ventress was getting chest movement when she was Neopuffing the baby off the ventilator. It's perplexing and I can't think of a natural cause why that would happen.

DRIVER: Thank you. Can we move to Dr Ventress' note at 06.05.

BREAREY: So [Baby G] had a further desaturation to 40% oxygen levels and her heart rate dropped to 80. Dr Ventress made the

decision to re-intubate with a larger ET tube. I was around at this time, I can remember. So she's talked about the heart rate being 120, but sats remained 50, and we increased the PIP, which is the peak inspiratory pressure ventilator, to 26. The oxygen inspired oxygen level was then 100%. The endotracheal tube was removed at 06.10.

Dr Ventress noted thick secretions from the mouth and a blood clot at the end of the endotracheal tube.

More intermittent positive pressure ventilation was given via the Neopuff -- sorry, via the face mask. Jaw thrusts and a Guedel -- Guedel is an airway adjunct to keep the airway patent in the upper part of the mouth and the pharynx. But despite this, there was poor chest movement and oxygen levels dropped to 17% and her heart rate to 70.

DRIVER: Pausing there, going back over that ground again in a little more detail, looking at the entry a few lines up which reads:

"IPPV given via ETT. Initially [and then an arrow]. Heart rate 120. Blood sat remained 50 despite [(inaudible) arrow] PIP to 26 and 100% oxygen."

BREAREY: That's correct.

DRIVER: Could you please elaborate upon that and the use of the words "but" and "despite" in there which seem to suggest --

BREAREY: The IPPV, I assume, is Dr Ventress using the Neopuff rather than the ventilator to provide positive pressure through the ET tube. The heart rate was above 100, but the oxygen levels were low at 50 and the peak inspiratory pressure was increased to 26, so much higher pressure than initially [Baby G] needed, despite 100% oxygen.

So you'd normally expect a higher pressure that you're delivering and a higher oxygen level you're delivering to increase the oxygen levels for [Baby G] in the knowledge that the tube was in the correct position. So despite those extra measures, [Baby G]'s oxygen levels were still not what you'd want.

DRIVER: So those were, at this point in time, those extra measures, resulting in the anticipated and desired consequences?

BREAREY: Mm.

DRIVER: Were they or were they not? Were they working as expected?

BREAREY: The oxygen levels were lower than you would expect for those interventions.

DRIVER: Thank you. Moving back to where I interrupted you, with apologies. So the face mask was being applied, jaw thrusts and a Guedel being used to enhance the respiratory support, is that correct --

BREAREY: That's correct.

DRIVER: -- in summary? And notwithstanding that, there remained poor chest movement and the saturation levels, according to this note, continued to drop, is that right --

BREAREY: That's correct.

DRIVER: -- now to 17% and now also her heart rate was dropping.

Was that a significant drop down to 70?

BREAREY: Certainly, yes. If you're below 100 you'd be concerned, yes.

DRIVER: Therefore, according to the note, you were called in urgently. Can you pick up the thread from there if you would, Dr Brearey?

BREAREY: Okay. So the NG tube was aspirated and appeared very large, 100ml aspirated. It doesn't say 100ml of what, but I'm assuming milk and stomach fluid/contents.

DRIVER: Yes.

BREAREY: This seemed surprising because [Baby G] had been on a feed of 45ml, three-hourly and had already had a large vomit that covered the cot and the area round the cot, and had aspirated 45ml as well at that time and then again, when we hadn't fed [Baby G], having 100ml aspirated in the stomach really appears to be abnormal and I can't explain where that fluid would have come from.

But that would be something that would be standard practice in aspirating the stomach prior to a further intubation which was planned, because you'd want the stomach empty prior to intubation.

DRIVER: So the aspiration was part of protocol, as it were?

BREAREY: Mm-hm.

DRIVER: But the results were surprising?

BREAREY: Exactly, yes.

DRIVER: And that surprisingly large quantity of fluid, to put it neutrally, having been aspirated, thereafter did her sats gradually improve?

BREAREY: Well, she was re-intubated at 06.15 with a larger tube, the 3.5 tube, and that was a tight fit through the cords, as Dr Ventress has recorded. There was some bloodstained fluid in the oropharynx, she has noted.

She suctioned below the cords, which means having a look at the vocal cords and passing a smaller suction catheter below the cords in case there's blood below the cords, in the actual airway itself, but nil was obtained from the area. So she can see blood in the oropharynx but not actually in the trachea.

DRIVER: Can you just help the jury with the distinction between the oropharynx and the trachea?

BREAREY: So the oropharynx is the upper airway and the oesophagus -- then splits into the oesophagus and then trachea, if you like, so the fact that she wasn't aspirating any -- behind the cords in the trachea might have suggested the blood was coming from some other place, either the oesophagus or the oropharynx.

She secured the ET tube at 8 centimetres at the lips, which it had been secured at before, so we knew the right position for the ET tube. And the capnograph was positive, which suggests that the ET tube was in the correct position. When listening with the stethoscope, we could hear a good air entry on both sides.

DRIVER: Thank you. A plan was formulated and discussed with you, according to Dr Ventress' note.

BREAREY: Mm-hm.

DRIVER: And could you expand upon the plan, please?

BREAREY: The plan was to give [Baby G] a pancuronium bolus, which is -- pancuronium is a medication to paralyse the baby to allow for better ventilation. So sometimes when babies are awake, they can breathe against the ventilator, which makes things more difficult, so usually a paralysing agent like pancuronium can help aid mechanical ventilation.

The second bullet point for the plan was to repeat a blood gas in 30 minutes. The third was to continue with morphine at 30 micrograms per kilo per hour for sedation. [Baby G] was to be nil by mouth and IV fluids to be given and to prescribe cefotaxime, an antibiotic, to cover for any infection. And parents were or were about to be updated.

DRIVER: Thank you. Let's just go through those bullet points again. You've explained the sedation was designed to make her more passive and aid the artificial ventilation.

BREAREY: Mm-hm.

DRIVER: The purpose of taking a gas in 30 minutes?

BREAREY: To assess how effectively we were ventilating her and whether there were any other signs that might explain the symptoms that we'd seen. It's standard practice to do this usually at that time after an intubation.

DRIVER: To continue with morphine; why?

BREAREY: Again it's a similar reason for the pancuronium, so [Baby G] was settled, not in pain, and responded to the ventilator in a more effective way.

DRIVER: The next bullet point, the nutritional feeding regime?

BREAREY: Well, she'd had a huge vomit and a huge aspirate, so from a medical point of view we weren't sure at that time whether there was anything wrong with her gut and whilst we performed further investigations and got a better idea of what was causing this, it would be good practice to not give her any enteral milk.

DRIVER: Thank you. And other than informing her parents of the development, there's one more entry, cefotaxime. The purpose of introducing that?

BREAREY: Cefotaxime is a broad spectrum antibiotic, which was standard practice on the unit at the time for treating late neonatal sepsis.

DRIVER: Thank you. We can see alongside the plan, the bullet points and plan, there's a review of an X-ray undertaken by Dr Ventress. Did you review that X-ray, can you recall?

BREAREY: Yes.

DRIVER: And what did it inform you of?

BREAREY: Well, I agreed with what's written there, that the lungs showed a typical picture of chronic lung disease of prematurity, which are diffuse patchy changes in both sides of the lungs, but that was known about previously.

There wasn't -- there didn't seem to be anything new that was apparent on the chest X-ray that would explain the symptoms that had happened that night. And there was no evidence of any pneumothoraces, which again is a possible cause for sudden deterioration in a preterm baby. And as described by Dr Ventress, the abdomen had some generalised gaseous distension, but nothing that would indicate obstruction, which is another possible medical cause for vomiting. And nothing that would indicate necrotising enterocolitis, which would be very uncommon at this gestation anyway.

DRIVER: Thank you. Mr Murphy, could we scroll further down the notes? We'll then see your handwriting I believe, Dr Brearey.

BREAREY: That's correct.

DRIVER: So a note made retrospectively, the note itself made at 8.15 that morning, which sets out, does it, in terms, that which you've just shared with the jury in your evidence?

BREAREY: That's correct, yes.

DRIVER: So Dr Ventress shared the history with you and all of which, if we're looking down -- just explain to us, including the AXR, the abdominal X-ray, which is where we just got to, I think -- you tell us what it says, please, next to AXR, just where the cursor is.

BREAREY: Yes:

"Gaseous abdomen, no perforation. Good air entry. Good gas post-intubation."

That was the first intubation.

DRIVER: Right. No perforation, I don't think you mentioned that when taking us through the X-ray.

BREAREY: Sorry. So necrotising enterocolitis, specifically in a severe form, can cause a perforation of the gut, so the gut is perforated and some gas then can escape from inside the bowel, and you can see evidence of gas outside the bowel, and there was no evidence of that either.

DRIVER: Thank you. Take us to 5.30, please, Mr Murphy.

Thank you.

BREAREY: So a fourth desaturation and bradycardia, as described by Dr Ventress, and as I've already discussed the change to a 3.5 size endotracheal tube, with less leak and better flow volume loops, that means for the F and the V loops. The ventilator has a flow sensor on it, which measures the flow of the gas in and out, and that gives (inaudible: coughing) loop with the inspiration and expiration and gives you an idea of the compliance of the lungs and the amount of leak and the ventilator was showing a better loop with the 3.5 tube than it did with the 3.0 tube.

DRIVER: Thank you. "Post-intubation"?

BREAREY: Yes.

DRIVER: Alongside the arrow, if we move the cursor down a line or two -- sorry, the gas, when it says "gas satisfactory", that's the results of a gas test were satisfactory?

BREAREY: That's correct, yes.

DRIVER: What does it say after the word "satisfactory"?

BREAREY: "Compensated metabolic acidosis."

DRIVER: What does that mean?

BREAREY: Looking at the gas results and reading this, I think this might have been an error on my part after a fairly long night, that the pH was normal and, if anything, showing compensated respiratory acidosis rather than metabolic acidosis. That might be an error on my part, I'm afraid, at that time of day, sorry.

DRIVER: The next entry?

BREAREY: We asked for a 10ml per kilo fluid bolus and for some IV dopamine to be started, an infusion to be started. Both of those would be given to support blood pressure and I have justified that in the next two lines. [Baby G] had had a further bradycardia and looked poorly perfused at this time and therefore that was the indication for the fluid bolus and starting the dopamine.

DRIVER: Thank you. The next entry is sedation, which you've already told us about. And then for further gas examination, is that, at 9 am?

BREAREY: That's correct.

DRIVER: And:

"Will need to discuss with Arrowe Park/Liverpool Women's Hospital."

Could you explain that entry to us, please?

BREAREY: Well, the designation of the unit we were at the time would allow for 48 hours of ventilation, but in addition, if the babies needed inotropic support in addition to mechanical ventilation, then the indication would be then that that baby is looked after in a neonatal intensive care unit such as Arrowe Park Hospital.

DRIVER: So that's a contemplation of what might be needed --

BREAREY: Exactly.

DRIVER: -- in the immediate future?

BREAREY: Yes.

DRIVER: And finally, her parents were kept up to date with events. Did that effectively conclude your direct involvement with [Baby G] on that date?

BREAREY: That's correct.

DRIVER: But as you indicated at the beginning of your evidence, you have continuing involvement with [Baby G] --

BREAREY: Mm-hm.

DRIVER: -- as her general paediatric consultant?

BREAREY: Mm-hm.

DRIVER: Is that right?

BREAREY: That's correct.

DRIVER: And could you, in a sentence or two, inform the jury as to the main features of [Baby G]'s condition and health as time as moved on?

BREAREY: Okay. So [Baby G] had an MRI scan of her brain following these events, which looked worse than her previous MRI scan and I believe my colleague [Dr C], one of the consultants in Chester, spoke to the parents at the time about the results of this. It's still uncertain at that early time what the long-

term prognosis looked like for [Baby G], but over the months and years since then [Baby G] has developed dystonic quadriplegic cerebral palsy.

DRIVER: Break that down for us.

BREAREY: Cerebral palsy is a condition, usually as a result of brain damage in early life, that causes the arms and the legs and muscles of the body to be usually stiff and of very limited function. The dystonia is an additional factor in some babies with cerebral palsy and causes episodes of stiffness and abnormal movement in limbs and other muscles of the body, which can make things considerably worse.

DRIVER: That's dystonia?

BREAREY: Dystonia, yes. In the first years of her life [Baby G] had a number of admissions to the paediatric intensive care unit for problems with aspiration and with chest infections that required further mechanical ventilation.

She initially started with a gastrostomy, which is a tube inserted directly into the stomach to have liquid feed, because she wasn't considered to have a safe swallow. That has since been changed into a gastrojejunostomy tube, so the tube goes further down the gut, which means that the food that she has is less likely to be aspirated and she's less likely to have chest infections.

So she is completely dependent on the care of her parents, who give an incredible level of care to her, and I have great respect for everything they have done for her over the last 6 or so years.

DRIVER: When you spoke a sentence or two ago about the risk of food being aspirated, in this context what does aspiration mean?

BREAREY: Aspiration in that context means stomach contents coming up from the stomach and, because her swallow and gag reflex isn't what most people have, then those stomach contents and the milk will go into the lungs and cause what we call an aspiration pneumonia.

MR JUSTICE GOSS: So unlike aspiration out of the body completely by a tube, this is within the body?

BREAREY: Exactly.

MR JUSTICE GOSS: There's aspiration upwards, essentially --

BREAREY: Exactly.

MR JUSTICE GOSS: -- and the risk is going into the lungs and effectively drowning the person?

BREAREY: That's correct, yes.

MR DRIVER: Thank you, Dr Brearey. Could you remain there and answer any questions asked of you?

Cross-examination by MR MYERS

MR MYERS: Dr Brearey, can I just confirm, in 2015 to 2016, which is the key period that we're dealing with, were you the neonatal lead at the Countess of Chester neonatal unit?

BREAREY: That's correct.

MYERS: And did you continue in that role in the period that followed that?

BREAREY: Up to 2020.

MYERS: All right. Just so we understand, the neonatal lead is the clinician whose role is -- it's an administrative role involved with the governance and management on the unit; is that correct?

BREAREY: That's correct, yes.

MYERS: As well as being a practising clinician too?

BREAREY: Clearly you spend more time dealing with neonatal issues, yes.

MYERS: So as neonatal lead, your role with the unit was to be responsible for administration and management?

BREAREY: Yes, but some of that management would include guideline developments, looking at clinical risk, incident review, that sort of thing, which were clinical areas that I was involved with.

MYERS: All right. Thank you. I'm just going to ask a few questions about [Baby G]; other areas of background we can deal with on another occasion.

At the time that this happened and [Baby G] experienced the events that you've described, your view at that point was that infection was the most likely cause of her sudden collapse and further deterioration. That's what you thought then, wasn't it?

BREAREY: That's what I... On the night you want to do everything you can for [Baby G] to preserve life and make her better, and infection would have been a differential diagnosis.

Immediately afterwards -- I'm looking at the CRP results that came back -- my initial impression was that it was infection, yes.

MYERS: Right. You've described the problems that [Baby G] encountered with breathing, or with respiration, while she was on the ventilator, you've described that. And one of the things that took place was the ventilator was changed, wasn't it, to see if that would assist with the breathing?

BREAREY: I didn't describe a problem with breathing, I described a problem with oxygenation on the ventilator.

MYERS: All right. One of the problems you described was oxygenation and what you did or one of things that was done was to change the ventilator to see if that improved oxygenation?

BREAREY: That's correct.

MYERS: As it happened, that didn't seem to improve oxygenation, did it?

BREAREY: No.

MYERS: But we've seen, we can look at the notes if you like -- if we stay on the section that we had, please, Mr Murphy, and go to page 6544 on the tile that we were looking at, the composite tile.

If we look down the page, we can see "ETT removed", can you see, about five lines down?

BREAREY: Yes.

MYERS: "ETT removed at 06.10."

That was the endotracheal tube that had been used on both ventilators, wasn't it? That was the arrangement?

BREAREY: Yes.

MYERS: Yes. So when there was the problem with oxygenation on the first ventilator, that was the tube that was being used, wasn't it?

BREAREY: That's correct.

MYERS: And when the problem with oxygenation continued on the second ventilator, that was the tube that was being used, wasn't it?

BREAREY: That's correct.

MYERS: When the tube was removed it was seen there were "thick secretions ++" in the mouth and a blood clot on the end of the tube. And that blood clot was something that was capable of interfering with air passing down the tube, wasn't it?

BREAREY: It might interfere with it, but it wouldn't have blocked it completely.

MYERS: No, but that could play a part in the interference with oxygenation, couldn't it?

BREAREY: The gases that were done prior to those desaturations didn't show a problem, so it might have had a small degree of influence but I wouldn't consider that to be significant in causing the desaturation that was seen.

MYERS: Do you remember how big the clot was? Do you remember it?

BREAREY: I can't, no.

MYERS: You weren't there, were you?

BREAREY: The only person that saw the clot was Dr Ventress.

MYERS: That's right. So a blood clot of sufficient size could block the end of an ETT, couldn't it?

BREAREY: I have never come across that in practice. The nature of a ventilator is that it's pushing pressure of 26 centimetres of water down an ET tube, so that the natural history of having any clot there would be that -- a clot isn't sticky enough to completely occlude an ET tube because you have 26 centimetres of pressure pushing the clot out of the way.

MYERS: Well, it was on the end of it, wasn't it?

BREAREY: It was on the end of it, yes.

MYERS: So it hadn't been pushed out of the way, had it?

BREAREY: Yes, but on the end of it doesn't mean completely occluding the internal diameter of the ET tube.

MYERS: The fact is you don't know how it was positioned on the end of the ET tube, do you, Dr Brearey?

BREAREY: None of us do.

MYERS: Well, Dr Ventress might; she was there.

BREAREY: Well, she saw the clot but that's after she took the tube out.

MYERS: Anyway, you agree, you don't actually know what position it was in, do you?

BREAREY: In my experience, when there's been blood in the airway previously, I've never come across a clot forming around the tube so it completely occludes it.

MYERS: Anyway, I'm not going to repeat what I've asked about that.

The aspirate that was removed, 100ml, we can see that referred to there. You've described that as -- you said:

"I assume that was milk/stomach fluid contents."

That is what you said, Dr Brearey.

BREAREY: Yes.

MYERS: Looking at what we've got on the note there, do we see any reference to milk, fluid or stomach contents?

BREAREY: No.

MYERS: No. You said it's surprising to find fluid like that.

BREAREY: Mm-hm.

MYERS: That would be surprising to you, would it?

BREAREY: Yes.

MYERS: It would be abnormal to find fluid like that in the circumstances, would you say?

BREAREY: Yes.

MYERS: Of course you were present at this point, weren't you?

BREAREY: I was.

MYERS: When you were asked about this, the prosecution also just now referred to this as being 100ml of fluid that was aspirated --

BREAREY: That's correct.

MYERS: -- in light of what you said. Do you remember in fact what it was that was aspirated that comprised that 100ml?

BREAREY: Well, the only other possibility, if it's not stomach contents or milk, would be blood, and I certainly don't recall 100ml of blood being aspirated because that would have been so unusual and abnormal that it would have been recorded by somebody.

MYERS: It could be air actually, couldn't it?

BREAREY: No.

MYERS: It couldn't be?

BREAREY: No because you're not -- you're aspirating fluid, you don't aspirate air from a syringe.

MYERS: If something surprising came out and it was worthy of comment, you would expect that to be recorded, wouldn't you?

BREAREY: Yes.

MYERS: And this doesn't say what it is that was aspirated, does it?

BREAREY: Because there can only either be milk or stomach contents that you're aspirating.

MYERS: Right.

BREAREY: If you're just getting air back -- quite often -- the process of aspirating prior to intubation is the NG tube that comes out of the stomach is taped to the side of the baby's face. The nurse connects the syringe to the NG tube and pulls back. If they just pull back air then that would be deemed to be not significant and not recorded. They'd only record something if they're pulling back fluid.

MYERS: You have been asked to comment and been taken to what Dr Ventress says in the notes so I think it's only fair we remind ourselves of what she said in evidence about this when the prosecution asked her questions.

She was asked about the aspirate, she said:

"Answer: It's quite common when you're giving the breathing support via the mask for their tummies to get bigger because when you're trying to force air into their lungs, you also force air down into the stomach as well, so it's quite common in that situation that the stomach will get bigger and you would aspirate air out of the stomach."

And the prosecutor asked:

"Question: Was it air?"

And Dr Ventress said:

"Answer: I can't say 100% from that. I would think, yes. I haven't documented it so I can't say exactly."

And the prosecutor said:

"Question: All right. Do you recall if -- well --"

And Dr Ventress said:

"Answer: I think I would have documented it if it wasn't air because that would be more unusual."

She was asked:

"Question: Can you tell us anything about the quantity, the 100ml, is that usual or unusual?"

"Answer: It's a lot but, as I said, we had been doing that, forcing air in, quite a lot."

So that's what Dr Ventress said. Her recollection was she couldn't say 100%, but in the circumstances she considered this to be air. Right?

BREAREY: I would agree that -- I wouldn't be able to say 100% but I don't think it would have been recorded if it had been air.

MYERS: We've heard what she said and she was a clinician who had been dealing with it throughout.

If we look at your note, can we move down, please?

Because you have said how surprising this is and you've had something to say to the jury about it in answer to questioning. If we look down at page 6545, you were present during this point. Whatever was going on at the time, we've got your note,

you didn't regard this as fit to document in any way, did you, the 100ml? You don't document it, do you, in your note?

BREAREY: No.

MYERS: No. If it was 100ml of fluid, which you have said is surprising and abnormal, you would expect that to be included in your notes, wouldn't you?

BREAREY: Yes. In retrospect I was concentrating on her care and it would have been easy today, knowing if this was going to court, that I'd recorded that, yes.

MYERS: Dr Ventress recorded it, didn't she?

BREAREY: Yes and as I've said, my history is as Dr Ventress' entry at the top of my record, so I had agreed with everything she had already written.

MR MYERS: I have nothing else to ask about that.

Thank you.

Re-examination by MR DRIVER

MR DRIVER: Just one issue arising: you were asked questions about the blood clot, if it was or may have been blocking or, to use your word, occluding the tube. If that or any substance or object completely blocked or occluded the tube, would the ventilator, the machine, acknowledge that?

BREAREY: Absolutely. There would be an alarm on the ventilator for that.

MR JUSTICE GOSS: Sorry, the alarm would sound on the ventilator?

BREAREY: It would, yes.

MR JUSTICE GOSS: Because it's blocked?

BREAREY: Exactly, yes.

MR DRIVER: And if it wasn't completely blocked but partly blocked, would the capnograph reading be influenced by that?

BREAREY: The capnograph isn't usually connected when the ventilator is in use. The capnograph is connected in between the endotracheal tube and usually the Neopuff, and usually when babies are on a ventilator for a period of time the capnograph isn't on there, so...

DRIVER: That's my error. If the blood clot or any other object or substance partially occluded the airway, short of utter blockage, would the ventilator record that or indicate that?

BREAREY: You might get an impression of that from the flow volume loops that I talked about, which would appear different on the screen of the ventilator.

MR DRIVER: Thank you. I have no further questions for you, Dr Brearey.

Does your Lordship have any questions for the witness at this juncture?

MR JUSTICE GOSS: No, I don't. Thank you. But you will be returning. We know that, you know that. So thank you very much for coming and giving evidence to us this morning, Dr Brearey. Would you please not talk to anyone about anything to do with this case and, in particular, your evidence and your involvement in it, but generally about anything to do with this case to preserve the integrity of your evidence.

BREAREY: Yes.

MR JUSTICE GOSS: All right. Thank you very much. You'll be notified when it is that you're required next year.

Thank you very much.

(The witness withdrew)

MR DRIVER: My Lord, may I call -- thank you, Dr Brearey -- Dr David Harkness again.

DR DAVID HARKNESS (recalled)

Examination-in-chief by MR DRIVER

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

HARKNESS: Yes. It's Dr David Ian Harkness.

DRIVER: As you've been informed previously, you are still bound by the oath or affirmation that you took when you first gave evidence in this trial. Today we would like to ask you questions about [Baby G]. Do you remember [Baby G]?

HARKNESS: Vaguely, yes.

DRIVER: And do you remember seeing [Baby G] on the neonatal unit in the early part of September 2015?

HARKNESS: Again, vaguely, but mostly from the clinical notes.

DRIVER: And have you had and taken the opportunity to refresh your memory from those notes prior to giving evidence here this morning?

HARKNESS: Yes.

DRIVER: And do those notes tell you that you were involved in [Baby G]'s care from, at the very latest, 4 September 2015?

HARKNESS: Yes.

DRIVER: Having refreshed your memory, can you, in a sentence or two, tell us how things were with [Baby G] at and around 4 September and the following day or two?

HARKNESS: So on 4th she was quite stable. I think from looking through the notes and what I put in my statement she was on low-flow oxygen, so quite a small amount of oxygen that lots of children would go home with. And the main thing that she was requiring was a bit of help with her feeding, so the tube feeds, and she wasn't far off going on to full bottle feeds and going home.

DRIVER: Your statement includes detail but we've just heard that detail from your colleague Dr Brearey as to how she was receiving 180ml per kilogram per day, which is a little greater than the norm and that was designed to add weight to her --

HARKNESS: Yes.

DRIVER: -- because she was, we understand and could you confirm, just a little under 2 kilograms in weight at this point in time?

HARKNESS: Yes.

DRIVER: And ideally, is this right, you would prefer babies to be a little heavier than that if they were to be sent home?

HARKNESS: Yes. Every unit will have slightly different thresholds. So it tends to be over 2 kilograms, but also, normally, we don't like them to be having the tube feeds when they go home either.

DRIVER: So the feeding regime is important because it's easier and safer for the parents to feed by bottle --

HARKNESS: Yes.

DRIVER: -- when unsupervised --

HARKNESS: Yes.

DRIVER: -- is that the position? And Dr Brearey told us, and could you confirm, that in terms of general trend, both respiration and here we're focusing upon feeding regimes, things were moving in the right direction --

HARKNESS: Yes.

DRIVER: -- generally speaking?

HARKNESS: Yes.

DRIVER: Thank you. I'm now going to ask you about 7 September 2015. I'll ask Mr Murphy to put up tile 147, please, and click on the underlying notes.

Your note, Dr Harkness, from 9 am on 7 September.

HARKNESS: Yes.

DRIVER: Thank you. We can see your note of her gestational age when born, but the corrected gestational age at this point in time. The problems, could you take us through those briefly, please?

HARKNESS: Overnight she'd had a sudden deterioration and we've put "[query] sepsis, [query] aspiration". She'd had -- we knew she already had chronic lung disease, she was ventilated and requiring quite high pressures to help with her lungs. So I think we've got there 26/6, which is pretty high, we'd normally expect it to be 20 or 22.

And there was also some blood seen on intubation.

DRIVER: Thank you. Pausing there, had you had any direct involvement with [Baby G] overnight, as you have called it, perhaps more accurately in the early hours of 7 September?

HARKNESS: No. This was -- I was on a day shift and this was my first port of call on the morning.

DRIVER: But no doubt you informed yourself of the content of her clinical notes as recorded by Dr Brearey and Dr Ventress --

HARKNESS: Yes.

DRIVER: -- previously? So sudden desaturation, part of the narrative. Query sepsis, was that your question or somebody else's question?

HARKNESS: That was the question from overnight.

DRIVER: And what was the basis of pondering that diagnosis?

HARKNESS: The most likely thing with any deterioration is sepsis, it's the most common occurrence we see in babies, so typically when they deteriorate it'll be one of the first things that we think about.

DRIVER: Thank you. How is that investigated?

HARKNESS: So we would do bloods to look for the CRP, for the white blood cell count and for blood cultures as well to look for the bacteria in the blood. If stable, we'll do a lumbar puncture, but at this point in time she was far too unwell to do that. Then we also look for the infection, so we would look for -- things like chest X-rays as well tend to be quite common things to do at the time as well.

DRIVER: And how consistently reliable are the blood culture tests designed to discover whether or not sepsis is a factor?

HARKNESS: So in a good sample, you do need to make sure you've taken enough blood, then if they are going to be positive, the vast majority will be positive within the first 24 hours.

DRIVER: Thank you. Moving to aspiration, is it in your entry as a possible cause of the sudden desaturation?

HARKNESS: Yes.

DRIVER: And in this context, what does that mean, that word?

HARKNESS: So aspiration, typically what we mean is that some stomach content or milk from the stomach is brought up, either by -- normally by a vomit and then, instead of being swallowed again, it's breathed in on to the lungs.

DRIVER: So inhaled --

HARKNESS: Yes.

DRIVER: -- rather than redigested effectively?

HARKNESS: Yes.

DRIVER: Thank you. Sorry, next entry.

HARKNESS: So CLD is chronic lung disease.

DRIVER: So that's her historic problem --

HARKNESS: Yes.

DRIVER: -- as it were, she being a very premature baby?

HARKNESS: Yes.

DRIVER: "Ventilated on high pressure." Again, is that the history?

HARKNESS: So that's the position that when I've come in, looking through the notes, the pressures that she needed to push the oxygen into her lungs was higher than I would normally expect a baby that's ventilated.

DRIVER: "Blood on intubation." Is this another aspect of your effective shorthand of the preceding note?

HARKNESS: Yes.

DRIVER: Thank you. So the next entry, V for ventilation, I anticipate?

HARKNESS: Yes.

DRIVER: We're now moving to your observations?

HARKNESS: Yes.

DRIVER: Could you talk us through them, please.

HARKNESS: SIMV is the type of ventilation mode which gives you breaths as you breathe in. 26 is the pressure that you need to give and, like I said before, about 18 to 22 would be where I would expect. When we get to 26 we're quite worried that the ventilation is not doing what it needs and we're kind of almost at the top end of the range. The 6 is the bit of pressure that helps to keep the lungs open in between breaths. Again, normally we'd go 4 to 5, so 6 is quite high.

The rate or how many breaths we give per minute is 50, which is on the higher side but not too dramatic.

And she's on 60 to 80% -- FiO2 is the amount of oxygen she is requiring to keep her oxygen levels up, which again is high.

DRIVER: So translating that data into words, was she continuing to require and receive a relatively high amount of respiratory support?

HARKNESS: Yes.

DRIVER: Thank you. Next entry?

HARKNESS: I have put:

"Continued desaturations and bradycardias."

So her oxygen levels were still dropping every now and again. That would have been seen from the nursing notes and from the observations chart. And if they drop their oxygen levels for a long point in time, their heart rate slows down, which is the bradycardia. So she's still quite unwell and not doing particularly well from a point of view of her breathing, despite being ventilated.

DRIVER: Pausing there, are you able to assist as to the relative degree of desaturations and bradycardia comparing the presentation at 9 am to that which preceded it in the early hours of the morning?

HARKNESS: Not from there. I'd need to look at the observation charts to make an exact observation.

DRIVER: Let's move on then. Tidal volumes?

HARKNESS: Tidal volumes is looking at the amount of oxygen that gets into the lungs and expands the lungs. So 7 to 8ml per kilogram is good. What that means is we know that the pressures that we're giving her are expanding the lungs to a good amount, which shows that what we're doing is working to a degree. So that's a good number and means that what we're doing is heading in the right direction.

DRIVER: F for feeds, is it, next?

HARKNESS: Yes.

DRIVER: Thank you. So we understand from Dr Brearey that the plan was to remove her from the feeding regime that she'd been prospering with in the days or weeks prior and now to provide her with assistance intravenously.

HARKNESS: Yes.

DRIVER: And that's effectively your record there, is it?

HARKNESS: Yes.

DRIVER: Thank you. CVS?

HARKNESS: Cardiovascular system.

DRIVER: How was that performing?

HARKNESS: We'd been struggling with her blood pressure. She's almost a term baby, so the mean blood pressure, the middle blood pressure we'd normally like to be around her gestation, so we'd expect it to be 38 to 40.

We were struggling to get to those numbers, so 30 to 36 is low, and she was on a medication called dopamine, which should help increase the blood pressure, so actually the fact that she's still got a low blood pressure on medication is quite worrying. Her heart rate was very fast at 200. We'd normally expect it to be in the lower hundreds to up to about 140 to 160 at most. So 200 is very fast. Some of that can be the medication, but also it can mean you are very unwell.

I have put there she's pink, so has good perfusion.

Her urine output, which is the UO, is 0.3ml per kilo per hour. That's very low. It's -- a good measure of how much blood is getting to your organs is how much urine you're able to put out, it means you're getting blood to your kidneys so get the urine out. We normally like that over 1ml per kilo per hour, so 0.3 is worryingly low.

DRIVER: Next entry?

HARKNESS: So that's CNS, central nervous system.

DRIVER: Dr Brearey informed us that she had effectively been sedated to enable ventilation to perform more effectively. Is that a reflection of that?

HARKNESS: Yes. So we sedate them and we also give them a muscle relaxant to paralyse them. I have put "no abnormal movements". Sometimes they will have fits. She is not fitting, I have not noticed anything like that. And again the soft spot on her head is soft.

DRIVER: The next line?

HARKNESS: Is haem, which is your kind of -- could be anything to do with blood going around the body. And I have mentioned there was blood seen on intubation, obviously not seen by myself, but this has been mentioned overnight. And we gave her vitamin K. So

if you have problems with clotting, the first you think of is, is there a deficiency of vitamin K, so we gave some extra with that, which can help with clotting.

DRIVER: Thank you. Sepsis?

HARKNESS: Sepsis, we put "Re-screened on the 7th", which was from the early hours of the morning.

"On cefotaxime day 1." That's one of the antibiotics at the time that we gave when we re-screened. The CRP was less than 1, so normal. Her white cell count was 10.1, which is normal. Her neutrophils were 1.4, which is on the lower side, which can suggest infection.

DRIVER: So re-screened to what end?

HARKNESS: So that was bloods taken, antibiotics started -- like I said no lumbar puncture at that point in time.

DRIVER: And the blood results or the results of the analysis of the blood taken, were they indicative of sepsis or not?

HARKNESS: The neutrophils can be low in infection, but not always, so that may be a suggestion, but the fact that the CRP is less than 1 doesn't tie together exactly.

DRIVER: Is this an exact science, as they say?

HARKNESS: No, not particularly. CRP can be up and down. There can be a delay to it. Neutrophils, again, can be up and down. If they're less than 1, we're concerned. 1.4 is the lower side but certainly not hugely alarming, but difficult to comment in isolation.

DRIVER: Thank you. Next, "Bloods"?

HARKNESS: Bloods. The sodium, Na, of 132, which is slightly on the low side, and K, the potassium, is 4.7, which is normal.

DRIVER: Thank you. The medication -- we've already heard of the medications that were provided and the reasons why. I'm going to invite your attention to the right side of the page above the pagination number J6546.

HARKNESS: So lines of three cannulas. I have put cannulae there, the Latin.

DRIVER: Can you tell us what that indicates and what was going on in that regard?

HARKNESS: So throughout the course of the night we would have needed to give various medications and when you're on that amount of medications you'll need multiple cannulas to give them because they can't all be given through the same cannula at the same time. So in her case with that many medications she needed multiple cannulas at that point, so she had three in place.

DRIVER: Thank you. Could you take us to the next page, Mr Murphy, scrolling down? A continuation of your note, is it, Dr Harkness?

HARKNESS: Yes.

DRIVER: And this entry at the top of the page?

HARKNESS: So I've put on examination she was paralysed and sedated and well perfused, so nice and pink. Her abdomen was soft with no masses. I could hear her bowel sounds.

Her abdomen was quite distended. Her femoral pulses were strong and present bilaterally.

DRIVER: And so you arrived at the following plan?

HARKNESS: The PEEP, the lower number on the ventilation, we have dropped to 5. Sometimes if it is too high it can interfere, so I have dropped that down to 5. The plan was for an arterial line, which from memory I had several attempts at, but was unsuccessful. Increased the dopamine to 10 micrograms per kilo. She was on a lower dose but because we were struggling with that urine output and the blood pressure, we have increased it. Have discussed with the tertiary centre because she was so unwell and we would be looking at transferring her to Arrowe Park or Liverpool Women's Hospital.

And then the other thing we wanted to check was her clotting with the next set of bloods that we wanted to do, just because she had had the bleeding -- the blood in the intubation overnight.

DRIVER: Thank you. I think then we have a slightly later entry from you again at 10 am that morning.

HARKNESS: Yes. So my review there is -- I've mentioned that I have unable to get the arterial line. Her mean blood pressure has now gone up to 52, which is good. Her capillary refill time is 3, so that shows that she's still, although she's pink she's not perfectly perfused.

Her colour has improved, so she's pinker and her peripheries now feel warm, so there is more -- it is giving us an indication

that the blood supply is better now the blood pressure is better.

Her blood gas shows a pH of 7.64, which is high.

Her carbon dioxide is 2.74, which is low. The bicarb of 22 is in the normal range. Base excess is still -- is normal. The lactate is 4.3, which is high, so that can show some stress and her getting tired. Glucose of 10.7, which is slightly high, which goes with stress.

And then what I have done is -- my plan is the ventilation is weaned to 24/5, so if the pH is high and the carbon dioxide is low, it suggests that we're now giving too much ventilation and if we overventilate them then that can be risky as well in itself. So we tend to make quite dramatic changes at that point. So we have dropped her top pressure to 24 from 26 and dropped her rate to 40 from 50. So that will slow that breathing down -- and carbon dioxide you breathe when you breathe out, so the slower you breathe the more carbon dioxide you will keep in your body. If their carbon dioxide goes higher, then the pH will come down. So that's what I have planned at that point in time. Because we made quite sweeping changes I have then put to repeat the blood gas in 30 minutes.

DRIVER: Thank you. So taking a step back, having reminded yourself of the detail of your notes from 9 am and 10 am on 7 September, all of which remained, having reviewed the recorded events from the early hours, how was [Baby G] when you examined her on those two occasions an hour apart that morning?

HARKNESS: She was incredibly sick. She'd stabilised by the point -- by 10 o'clock she was certainly looking better but was still incredibly sick and we were still incredibly worried about her at that point in time.

DRIVER: And how was her presentation relative to and compared with that recorded by Dr Ventress and Dr Brearey in the earlier hours of the morning?

HARKNESS: Things were improved, but still needing a lot of support and certainly not out of the woods at that point in time.

DRIVER: And was there anything in your observations and examination of and pertaining to [Baby G] that enabled you to diagnose what had happened or not?

HARKNESS: No. The blood tests weren't conclusive of sepsis.

I can't remember exactly why aspiration was on the list.

It may well have been extrapolation from the feeds or it may very well have been the X-ray findings, but I have not -- I didn't see those at that point in time. But certainly from what I saw, there was nothing that was concrete that would say this is definitely sepsis or definitely something else.

DRIVER: Would it be exceptional to consider aspiration in this context or is that part of a checklist effectively?

HARKNESS: It's certainly uncommon. It's certainly not something that we would put in the majority of collapses. It wouldn't be high on our list of concerns.

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

Cross-examination by MR MYERS

MR MYERS: Just a couple of points, please, Dr Harkness.

Do you agree that a sudden deterioration, like the sort that [Baby G] had on the night of the 7th, in the early hours of the morning of 7 September 2015, is not uncommon?

HARKNESS: We see it. It's very rare to see it in an otherwise stable term baby. So I can't say that it's incredibly common, but it does happen.

MYERS: All right. Just so it's clear where I've got that from, could Dr Harkness be shown his statement? It's at page 1922. So I'm going to ask if you can have a look at this together with his Lordship and the barristers.

it's page 3 of your statement.

While we wait to get that, I'll just confirm that this is a statement that you made on 14 September 2018, Dr Harkness.

(Pause)

If we just scroll down a little bit. Can you see you refer to "in respect of 7 September" at the centre of that page, Dr Harkness?

HARKNESS: Yes.

MYERS: And you say that you've referred to your -- "referring to my medical notes entry at 9 am", and then you say this:

"[Baby G] during the night had a deterioration. A sudden deterioration like this is not uncommon. Subsequently requiring intubation."

That's how you put it there, isn't it?

HARKNESS: That's how I put it in 2018.

MYERS: Yes.

HARKNESS: Subsequently, after having -- what was that -- 5 years' further experience and experience as a consultant, from that point to now I would say I've seen considerably less collapses than at that point in time. So I would say unless I changed my statement to reflect my current experience, current experience tells me differently.

MYERS: How long had you been practising as a doctor by the time you made your statement in 2018?

HARKNESS: That was 7 years. And that's not uncommon -- that was not referring directly to the gestation of babies. If I was to look through everything from 23 weeks up to term then, if I went into it in more detail, I would say the likelihood goes -- decreases as they get older, both in gestation when they're born and gestation from when they're born. So as a point of generalisation I would say it is not be common, but if you were to pin it down to 38 week gestation babies who were otherwise doing incredibly well, I would say that was uncommon.

MYERS: So you were 7 years' experienced as a doctor when you wrote that?

HARKNESS: Yes, not all in neonatal medicine.

MYERS: In any event you agree at the time you wrote that you said a degree of deterioration is not uncommon?

HARKNESS: Yes.

MYERS: And in fact, when you came to consider this, your view, Dr Harkness, was there was no surprise to [Baby G]'s deterioration because there's always a risk of infection and the immune systems of a baby like [Baby G] are not established; do you agree with that?

HARKNESS: Have I written that in my statement?

MYERS: You have and I can take you to it if you like. Could we go over the page to page 4 of 7, so page 1923. Just scroll down

that page, please. Just in the centre of that page, just taking the words that you used, Dr Harkness:

"[Baby G]'s deterioration on 7 September 2015 was of no surprise to me as this can happen and is relatively common. There is always the risk of infection because their immune systems are not quite established. [Baby G]'s event was not debriefed."

Do you see that?

HARKNESS: Yes.

MYERS: That's what you said then and do you agree that it can be relatively common because their immune systems aren't established and that increases the risk of infection?

HARKNESS: Certainly that was my feeling at the time. In hindsight I would say I've seen less and less over time and I would no longer, with my current experience, call it common.

MYERS: But your experience then, as a registrar in a busy unit, was that it was common?

HARKNESS: Certainly after my time in Chester, I thought that was quite common, yes.

MYERS: No, in your 7 years as a registrar.

HARKNESS: I wasn't a registrar for 7 years, no, but my experience was 7 years.

MYERS: Yes. And at that point you felt it was relatively common?

HARKNESS: Yes.

MYERS: Thank you. To be clear, that is because their immune systems have not established, isn't it?

HARKNESS: Yes.

MR MYERS: Thank you, Dr Harkness.

MR DRIVER: I have no re-examination, my Lord. Does your Lordship have any questions?

MR JUSTICE GOSS: I don't. Thank you, Dr Harkness.

MR DRIVER: Dr Harkness will be coming back.

MR JUSTICE GOSS: So everything I've said before several times still applies. Thank you very much.

(The witness withdrew)

MR DRIVER: The next witness is Nurse Booth.

MR JUSTICE GOSS: We'll have a break anyway. No more than 10 minutes, thank you very much.

(12.09 pm)

(A short break)

(12.20 pm)

MR CHRISTOPHER BOOTH (sworn)

Examination-in-chief by MR ASTBURY

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

BOOTH: Christopher Neil Booth.

ASTBURY: And your profession, please?

BOOTH: Senior nurse.

ASTBURY: Thank you. Could I ask whether you were employed in that capacity at the Countess of Chester Hospital back in September of 2015?

BOOTH: I was, yes.

ASTBURY: Which particular department were you at?

BOOTH: Working on the neonatal unit.

ASTBURY: Thank you. We've heard that there were different grades for nurses on the unit. Could I ask what your grade was then?

BOOTH: I was a band 6.

ASTBURY: And would you, from time to time, work as a shift leader in that capacity?

BOOTH: Yes, but not exclusively.

ASTBURY: No. We've heard that it was a responsibility that rotated around the senior nurses on the team.

You know you've come here to discuss a baby by the name of [Baby G]. And in particular, a shift between the 6th and 7 September

2015. Before going into the detail of that, do you recall [Baby G] generally?

BOOTH: Um... I do. She was an extremely premature baby who came to us from Arrowe Park Hospital and she was approaching her 100th day milestone on the night of her -- this collapse. And yes, we knew [Baby G] well and knew the family well.

ASTBURY: How did you gauge [Baby G] to be doing in the run-up to the 6th into 7 September in your care?

BOOTH: She was making progress and establishing -- what we call establishing feeds. She was taking some feeds by bottle and other feeds -- because she wasn't quite up to taking all of her feeds by bottle, she was having some feeds via a nasogastric tube.

ASTBURY: And we have heard that would be done by a syringe that would be effectively attached to the tube?

BOOTH: Yes, and it is fed by gravity.

ASTBURY: Thank you. You mentioned that [Baby G] was coming up to her 100th day --

BOOTH: That's right.

ASTBURY: -- birthday, as it were. Do you recall anything specific with that in mind about this shift?

BOOTH: I mean, it is quite vague because it's such a long time ago, but I do recall that when I made my statement it was more embedded in my memory. But I do recall her fast approaching her 100th day milestone.

ASTBURY: All right. Is that seen as a considerable milestone on the unit?

BOOTH: It is, yes. It's a big achievement, really, yeah. And we do make a big thing about it. It's an important event. We make banners for the baby and the family and a member of staff usually will often bake a cake and bring it in for the family to celebrate.

ASTBURY: Right, okay. We have to your right a screen, which may offer you some assistance, and I'd like to show you first tile 47 on our system, which I hope is a representation of the shift or the start of the shift that we're going to be discussing.

So the way that we have represented it there, we can see the consultants. In fact one consultant was on duty. We can see who

the registrar and the senior house officer were for that shift. We can see the shift -- sorry, the nursing staff.

There's some query over the shift leader. Do you specifically remember whether you were the shift leader that night or not?

BOOTH: I couldn't recall, no.

ASTBURY: All right. According to this, it was either you or Nurse Simpson, from whom we have heard, and also on duty nurses [Nurse E] and Lucy Letby.

BOOTH: Yes, that's right.

ASTBURY: If we scroll down further, we can see that the nursery nurse was Lisa Walker and then on the bottom part of the page -- does it help to have your glasses or would it help to enlarge it a little bit?

BOOTH: If you could enlarge it, please.

ASTBURY: It doesn't look like that's possible. This shows the allocation of babies that particular night and their location, where it can be established. Are you able to see the names?

BOOTH: Yes.

ASTBURY: And generally the plan of the unit?

BOOTH: Yes.

ASTBURY: Does that accord with your recollection of the unit?

BOOTH: That's a good -- yeah, that's a good illustration.

ASTBURY: We have a larger room to the right of the centre which is nursery 1.

BOOTH: Yes.

ASTBURY: And then on the left-hand side we have, ascending, nurseries 2, 3 and 4.

BOOTH: Yes, that's a fair representation.

ASTBURY: Thank you. You may or may not be able to assist us with this, but in the box on the bottom right the baby to whom you were allocated had the initials DB. I don't know if you recall which room DB would have been in that particular night.

BOOTH: I don't, sorry.

ASTBURY: Let's move on. Let's see what, if anything, you can remember. You mentioned earlier a collapse that was suffered by [Baby G] on this particular shift. Can you tell us, please, when you first became aware of [Baby G] being unwell that night?

BOOTH: Again, this is a mixture of memory, intermingled with what I've read from the computer system.

ASTBURY: So you've had access to the notes to try and refresh your memory?

BOOTH: Yes.

ASTBURY: And hopefully you've also refreshed your memory from your statement today that you provided to the police on the earlier date you mentioned. It's not a memory test.

If you can help us with what you can remember of that particular shift.

BOOTH: I thought [Baby G] was in nursery 3.

ASTBURY: Right.

BOOTH: But it's saying here that she is actually in nursery 2, but I do remember a call being made out at about 3/3.15, where she had deteriorated -- had had a sudden deterioration --

ASTBURY: Okay.

BOOTH: -- where she had -- her oxygen levels had dropped and her colour was poor and her heart rate had dropped.

ASTBURY: Were you aware of an incident a little earlier in the shift where [Baby G] had vomited?

BOOTH: I wasn't at that time. That was ascertained later on between discussions between staff when we were working with [Baby G] and it was mentioned that she had had a large vomit at about 2.15/2.30 am.

ASTBURY: Do I take it then from what you're telling us, you weren't involved in that?

BOOTH: No, I... My... I was quite peripheral in this incident. I was there to help with the resuscitation.

ASTBURY: Because you had your own baby to look after?

BOOTH: Yes, that's right. We have our own workload, so it was a case of just helping [Baby G] at that time.

ASTBURY: Okay. So no involvement in the incident of vomiting that you were later told about?

BOOTH: I have no recollection of the vomit, no.

ASTBURY: But you were telling us about an incident, you think, about 3.30?

BOOTH: About 3/3.15 am.

ASTBURY: Thank you. Tell us what you know of that, please.

BOOTH: A call, verbal call, was made to seek assistance and I went in. There was already staff in the nursery.

Again, I can't recall who was delivering the breaths, but [Baby G] was being given oxygen and breaths via a Neopuff device to...

ASTBURY: So you were elsewhere in the unit?

BOOTH: Yes.

ASTBURY: And you had a call for help?

BOOTH: Yes.

ASTBURY: You made your way to the room where [Baby G] was situated?

BOOTH: Yes.

ASTBURY: Can you tell us who you saw when you went in?

BOOTH: From what I recall and what I've read, Lucy Letby was there and [Nurse E]. I don't recall Lisa Walker being on that shift, but obviously she was. There was a senior house officer present as well and a call -- an urgent call was made out for the registrar, Alison Ventress.

ASTBURY: Right, okay. When you went in and you saw Nurses Letby and [Nurse E], can you remember what they were doing when you went in?

BOOTH: Delivering what we call sort of rescue breaths, resuscitation breaths, via a Neopuff device, which is a silicone mask attached to an air/oxygen mixture device.

ASTBURY: Right. Can you remember who was operating that at the time?

BOOTH: No, I'm sorry, no. But what I do recall was after she had recovered at that time, after about 10 minutes or so, it felt prudent to move her into a different nursery, into nursery 1, which is the intensive care nursery --

ASTBURY: Right.

BOOTH: -- which has more equipment and is more appropriate for sicker babies.

ASTBURY: So this is about 10 minutes after you were first alerted to the problem?

BOOTH: Yes.

ASTBURY: You'd gone in -- you mentioned Dr Ventress, were you there when Dr Ventress arrived?

BOOTH: Yes, I would have been, yes.

ASTBURY: Did you assist in moving [Baby G] into nursery 1?

BOOTH: I remember assisting in the moving of [Baby G] into nursery 1. But other than that, I can't remember the specifics of what I did.

ASTBURY: Okay. You told us that you weren't present when [Baby G] was sick and you were told about that later in the shift.

BOOTH: Yes.

ASTBURY: Were you present or aware of any further issues with [Baby G] during the course of that shift?

BOOTH: I... I was aware that she had a few more what we call apnoeic episodes, where she had pauses in her breathing, dropped her heart rate and her oxygen levels fell, but because -- once she had settled into nursery 1 and there was -- I was happy with who was looking after [Baby G], I sort of, like, took a backwards step and they were very competent nurses so they were caring for [Baby G].

ASTBURY: Do you recall who was looking after [Baby G] when you reached that view?

BOOTH: I think it was Lucy, Lucy Letby, yes. And...

ASTBURY: So no more personal involvement with --

BOOTH: For the rest of the night, no. I would have -- if sort of nursing numbers had been diverted towards [Baby G], then it would make sense for staff to sort of like bolster the outside nurseries and look after the babies in the outside nurseries.

ASTBURY: Right, okay. You were aware because it's a relatively small unit, but no further involvement in any other episodes?

BOOTH: No.

ASTBURY: We, of course, do have the benefit of the notes so I would just like to show you some more entries, please, and see if you can assist us with those for the sake of completeness.

If we look at tile 109, please. This is a representation of the administration of medication.

BOOTH: Okay.

ASTBURY: We have underlying it the prescription, which you can look at if you wish, but yourself and Nurse Simpson, who you told us about -- we've heard that cefotaxime is an antibiotic.

BOOTH: Yes.

ASTBURY: And it would appear, would this seem right, that you, or between you, administered cefotaxime at about 05.47?

BOOTH: Right, okay.

ASTBURY: We've heard that there's two nurses, one administers, one co-signs on the computer?

BOOTH: Yes. All drugs for babies have to be checked with two registered nurses. So --

ASTBURY: You have no recollection specifically of that?

BOOTH: I don't recall that, but clearly it did happen.

ASTBURY: Thank you. If we can just scroll across in a similar vein. Sodium chloride administered again, it would appear on the same occasion, 05.48 on the time recording. If we scroll across again, the computer is updated with the medication at 05.48. So as we understand it, correct us if I'm wrong, the medication is administered by the two nurses -- checked and administered, sorry, I should say.

BOOTH: Yes.

ASTBURY: And then thereafter, entered on the computer as having been done?

BOOTH: Yes, that's a fair -- yes.

ASTBURY: If we can go finally to tile 134. Perhaps if we can look at this document, your name appears on -- it may be the same sort of arrangement that we've just discussed.

If we can look at the relevant entry at 07.30, I think it was.

This is a form you'll be familiar with, I'm sure.

BOOTH: Yes.

ASTBURY: And it would appear that at 7.30 you've assisted -- I think, I'll be corrected if I'm wrong, it's Ms Letby's signature at the bottom of the column.

BOOTH: Okay.

ASTBURY: With the administration of... But a further --

BOOTH: Midazolam.

ASTBURY: Thank you very much. But no recollection?

BOOTH: Sadly, no.

MR ASTBURY: Thank you. Well, I have no more questions for you, but if you could wait there, there may be one or two.

MR MYERS: We have no questions, my Lord.

MR ASTBURY: Does my Lord have any questions?

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

You are on the list to come back in the New Year to give evidence --

BOOTH: Of course, yes.

MR JUSTICE GOSS: -- in relation to someone else. You'll be aware of that. So please don't talk to anyone about anything to do with this case and, in particular, any involvement you have with it and the evidence that you've been giving or any evidence in the case.

BOOTH: Yes, certainly.

MR JUSTICE GOSS: Thank you very much. If you just wait there. Sorry, you're going to have to stretch your legs again. Just a two-minute break now, please.

(In the absence of the jury)

MR JUSTICE GOSS: If everyone apart from the lawyers could leave the courtroom very briefly, please, and the court staff, obviously.

(Pause)

(In the presence of the jury)

MR JUSTICE GOSS: Yes, Mr Johnson.

MR JOHNSON: Thank you, my Lord. Dr Dewi Evans, please.

DR DEWI EVANS (recalled)

Examination-in-chief by MR JOHNSON

MR JOHNSON: Thank you, Dr Evans. Would you just, for the sake of the record, give us your full name, please?

EVANS: Dr Dewi Evans.

JOHNSON: Thank you. Dr Evans, so far as the case of [Baby G] is concerned, the jury knows that there are actually three counts concerning [Baby G]'s case, counts 7 to 9 inclusive.

All we're dealing with at the moment is count 7.

EVANS: Yes.

JOHNSON: All right?

EVANS: Yes.

JOHNSON: So the events of and leading up to 7 September.

EVANS: Yes.

JOHNSON: Just as a reminder for the rest of us, there were events also on 21 September, about which you have written reports?

EVANS: Later I did, yes.

JOHNSON: But for now if we just concern ourselves with the events of the 7th, please. If I can just summarise...

(Pause)

If I can summarise the position then, please.

You have written several reports, haven't you, in [Baby G]'s case?

EVANS: I have, yes.

JOHNSON: The first was dated 6 November 2017?

EVANS: That is correct.

JOHNSON: Was that your original sift report?

EVANS: Yes, it was.

JOHNSON: Did you then write a more detailed report on 31 May 2018?

EVANS: I did.

JOHNSON: Followed by a report on 24 March 2019?

EVANS: I did.

JOHNSON: And that report on 24 March 2019 concerned primarily the events of 21 September 2015?

EVANS: Correct.

JOHNSON: You followed up with some additional reports of 17 October 2021?

EVANS: Yes.

JOHNSON: 21 October 2021?

EVANS: Yes.

JOHNSON: 22 April 2022?

EVANS: Correct.

JOHNSON: And then finally, 14 September 2022?

EVANS: Yes.

JOHNSON: Thank you. I'd like to start, if we may, please, with your report of 31 May 2018, which for your Lordship's note is at I2008.

It's a little time since we went through the sequence of events relating to [Baby G], so I'd just like to deal with a few dates with you first of all, please, Dr Evans. As you point out in your report, [Baby G] was born on 31 May 2015.

EVANS: Yes.

JOHNSON: That was, of course, at Arrowe Park Hospital.

EVANS: Yes.

JOHNSON: On 14 June 2015, so 2 weeks after she was born, she was examined via a cranial ultrasound; is that right?

EVANS: Correct.

JOHNSON: Was that to identify whether or not she had any bleeding on her brain?

EVANS: Yes. Brain bleeds are very common in premature babies, so cranial ultrasounds are carried out routinely. The absence of bleeding is always a very encouraging sign.

JOHNSON: Yes. Just to remind ourselves, of course, [Baby G] had been born exceptionally early, hadn't she?

EVANS: Yes.

JOHNSON: 23 weeks and 6 days' gestation?

EVANS: Yes.

JOHNSON: And she had weighed at birth 535 grams?

EVANS: Yes.

JOHNSON: I think in one of your reports you described that as being at the edge of viability or words to that effect or the limits of viability?

EVANS: I did, I did.

JOHNSON: On 29 June 2015, [Baby G] had what's called a Broviac line fitted; is that right?

EVANS: Yes.

JOHNSON: And I think this sort of intravenous access is something that we'll hear about more in one of the other cases; is that right?

EVANS: Yes.

JOHNSON: But in effect, is it IV access that's achieved by the surgeons?

EVANS: Yes. A Broviac line is inserted into a large blood vessel and it requires a surgical procedure and it's used in premature babies because getting IV lines is difficult and is painful, therefore you get a Broviac line in, into a main blood vessel, it can stay there for quite some time. It's how you would give intravenous nutrition -- we've heard about TPN -- and also intravenous antibiotics, if required, or any other requirement that needs intravenous access.

JOHNSON: Was there a further ultrasound examination -- I'm looking at paragraph 8 at your report now -- a cranial ultrasound examination of [Baby G]'s brain on 30 June?

EVANS: Correct. That showed -- that was essentially normal.

The important thing was no IVH. IVH is intraventricular haemorrhage. Therefore there was no evidence of bleeding into the brain. So a very satisfactory finding.

JOHNSON: Did [Baby G] then remain at Arrowe Park, the tertiary hospital, until she was discharged on or about 13 August 2015?

EVANS: Yes, that's correct.

JOHNSON: On your examination of the medical notes, did you find notes running up to and including 13.00 hours on 13 August?

EVANS: I did. I didn't summarise them all in detail, but yes, I saw that, and it covered her progress there, yes. And she was stable.

JOHNSON: Yes. At discharge from Arrowe Park, was [Baby G] receiving ventilatory support via CPAP?

EVANS: Yes. She was requiring 30% oxygen. She was known to have what we call chronic lung disease.

JOHNSON: Yes.

EVANS: Therefore she was still needing oxygen -- not a great volume, 30%, not a great concentration -- and she also required CPAP, which is this mechanism whereby babies receive their

oxygen via slightly raised pressure. So it's a standard management of babies, premature babies, when they require -- when they have chronic lung disease. So having said all of that, she was stable.

JOHNSON: So looking at your paragraph 13 of the statement of 31 May, Dr Evans, do we see there in effect you setting out in writing what you've just told us?

EVANS: Yes. I mean, her first couple of weeks at Chester, she was requiring 28% to 31% oxygen, therefore the same as she was when she arrived from Arrowe Park. Another brain ultrasound had shown -- reported what was described as mild bilateral ventriculomegaly, which is not uncommon and not generally deemed a concerning finding, more on the left than the right. Otherwise she had a normal heart rate, she had a normal breathing rate, she had a normal temperature. Her tone was described as being normal. She required support, medication-wise, so she was given Gaviscon, which is very, very commonly used in small babies, and she was also given a combination of diuretics, which again -- furosemide and spironolactone, and these are again drugs that are given in little babies. She had supplemental sodium. We heard earlier today that her sodium was a little on the low side, so she was having sodium chloride and Sytron, which is an iron supplement.

So she was receiving iron.

So all was well and her oxygen saturation was 95%, which is very satisfactory.

JOHNSON: Yes. You have just repeated a term that we heard for the first time this morning from Dr Harkness, which is mild bilateral ventriculomegaly, but you didn't give us any further explanation as to what that meant.

Could you just remind us what it means, please?

EVANS: Yes. The brain has two hemispheres, left and right.

And in the middle there are two potential -- well, holes, really, ventricles. Premature babies, if you get a -- are at risk of getting a haemorrhage, a bleed, into these ventricles which are set in the middle of the brain. The ventricles have a normal range which you can measure on ultrasound. [Baby G]'s ventricles were slightly larger than average. But as an isolated finding, this is not uncommon and it's something that you simply record.

JOHNSON: Thank you. It may help us, Dr Evans, to go to the more recent jury bundle, which is this jury bundle number 2.

MR JUSTICE GOSS: Yes. You put it on the floor, I think.

MR JOHNSON: I think it's at the bottom, as always. It's the one with 24 dividers in or thereabouts.

EVANS: Yes.

JOHNSON: This will help us to navigate your evidence as to [Baby G]'s condition, hopefully. Just to remind us, because it's been a while since we looked at this material, the first page, it's divider 7 of course because we're dealing with count 7.

The first page has the page number in the bottom right-hand corner in red, J6959.

EVANS: Yes.

JOHNSON: Is this the observation chart running from 23.00 hours on 23 September (sic) through to 17.00 hours on 5 September?

EVANS: On 2 September.

MR JUSTICE GOSS: The 2nd.

MR JOHNSON: What did you say?

MR JUSTICE GOSS: The 23rd. You were eliding, I think, the 2nd and the 3rd, creating the 23rd. We knew what you meant because we are all looking at it in the top left-hand corner. We could see it starts at 23.00 on the 2nd.

MR JOHNSON: Sorry. It's having a day off. It's thrown me out. Right.

Dr Evans, do we see there that [Baby G] was being -- it's not always the case, but generally speaking, having her observations taken about every 3 hours?

EVANS: Something like that, yes.

JOHNSON: Yes, there are exceptions to that, but generally speaking over that period of time, observations every 3 hours. So over that period of time, what would you observe as being her general state from the observations at least?

EVANS: Right. Very satisfactory. If we look at the first page, which goes from the 2nd to the 5th, you have a normal pattern of heart rate. You have a normal pattern for respiratory rate, 50 to 60. Her temperature's normal. Then towards the bottom on the extreme left hand, you've got SaO₂, that's oxygen saturation,

which we've mentioned, and her oxygen saturations measured -- there's 99, 98, 97, 100, et cetera. So all very satisfactory. And she's in oxygen, 30%, and then I think we heard earlier today that she was put on low-flow oxygen because her condition was getting even better.

JOHNSON: Yes.

EVANS: So 0.06 and 0.07, that relates to the amount of oxygen she was getting. So that page, very satisfactory.

JOHNSON: Okay. Could you just stop you there so we all follow what you're saying? So we have the SaO₂, which is saturations inn oxygen; is that right?

EVANS: Yes.

JOHNSON: Below that, O₂, which is the chemical symbol for oxygen?

EVANS: Yes.

JOHNSON: We see 30% reproduced on -- ignoring the one that's crossed out, there are four of those; is that right?

EVANS: Correct, yes.

JOHNSON: And we then go to the entry at 11 am, 11.00 hours, on 3 September, and that goes to 0.08. Is that a reflection of the moment at which -- the means by which [Baby G] was being given oxygen changed?

EVANS: Correct.

JOHNSON: So an improvement at that point in the sense of the intrusiveness of the system by which oxygen was being administered to [Baby G] was less?

EVANS: Correct.

JOHNSON: All right. So a reflection of the fact she was doing better. We then have, what, cares; is that right?

EVANS: Yes.

JOHNSON: Do you know what the next word is? Is it "position"?

EVANS: "Position" and "probe". I'm not sure what probe applies to.

JOHNSON: All right. Moving on then, on the 6th into the 7th, and indeed -- well, we start on the 6th at 20.00 hours with a continuation of observations every 3 hours.

EVANS: Yes.

JOHNSON: Is that right?

EVANS: Yes.

JOHNSON: And that changes between 2 and 4 o'clock in the morning when it goes down to 2 hours and then from 4 to 5, it goes down to hourly observations?

EVANS: Yes.

JOHNSON: Just to remind us, in the respirations line or section/block, we see that the rate of respirations is recorded in two different ways. One is with dots that look a bit like tadpoles --

EVANS: Yes.

JOHNSON: -- which moves at 4 am to crosses in circles.

EVANS: Yes.

JOHNSON: What do those two alternative ways of recording respirations denote?

EVANS: Right. Well, the first half, the bit on the left, is a continuation of the respirations from the previous few days. So her resps vary between 40 and 50/55. The crosses simply is -- I'm not quite sure what the crosses relate to. In the context of the fact we know she'd collapsed, so presumably these crosses indicate that she was receiving ventilatory support.

JOHNSON: Yes.

EVANS: That is what I would assume is the difference in the way that her respiration has been recorded.

JOHNSON: Yes. Well, I think you're right. I think those records of the cross in the circles coincide with the time at which she was put on to a ventilator.

EVANS: Yes.

JOHNSON: Up to 2 in the morning -- we'll come to the rest of it in due course -- how would you describe -- I should say on the

morning of 7 September, how would you describe [Baby G]'s observations?

EVANS: Again, very much the same as the day before. If we look to SaO2 again, we've got a number of recordings of oxygen concentration -- sorry, oxygen saturation, I mean.

JOHNSON: Yes.

EVANS: The first one is 96 and then there's a 98, 98, 97, et cetera, 93, 92, 97. So again, very stable. Very, very slight variations, absolutely fine. Her oxygen requirement -- she is still on this low-flow measurement, which is why you've got 0.06 or 0.07 rather than an oxygen concentration itself. So therefore up until around 2 in the morning, her condition remains as satisfactory as it was for the previous few days.

JOHNSON: Thank you. Before we have our midday break, if I just deal with the other documents here just to remind us where things are if people want to search them out as you continue with your evidence.

Turning beyond the observation charts, please, to the intensive care chart, which has the number 6962 in the bottom right-hand corner, does that record various substances being given to [Baby G] on 7 September --

EVANS: Yes, it does.

JOHNSON: -- starting at 4 o'clock in the morning?

EVANS: Yes, it does.

JOHNSON: We see 10% glucose, morphine, midaz -- is that short for midazolam?

EVANS: Midazolam. Yes, that's right.

JOHNSON: Dopamine and then bolus and then what the bolus is is recorded, or sometimes recorded, alongside those figures, together with output of various things.

EVANS: Yes.

JOHNSON: Then a page further on, 6971. Is this the blood gas chart?

EVANS: It is.

JOHNSON: Which continues over to 6972?

EVANS: It does.

JOHNSON: And then the final two pages in this section, are they the feeding chart?

EVANS: They are.

JOHNSON: Being 5 September at 7012?

EVANS: Yes.

JOHNSON: And the bottom half of that page, 6 September?

EVANS: Correct.

JOHNSON: And finally at 7013, 7 September and the feed at 2 o'clock in the morning --

EVANS: Yes.

JOHNSON: -- administered by [Nurse E]?

EVANS: Yes.

MR JOHNSON: My Lord, that may be a good moment.

MR JUSTICE GOSS: It is, certainly. Thank you very much.

We'll break off there and resume at 2.05, please, members of the jury.

(1.04 pm)

(The short adjournment)

(2.05 pm)

MR JUSTICE GOSS: Mr Johnson.

MR JOHNSON: Dr Evans, we had just reminded ourselves of the contents of the jury bundle in terms of the documents.

We heard this morning from some of the treating medics that, in their view, [Baby G] was in an entirely satisfactory condition as at the beginning of the night shift of the 6th into 7 September. Would you agree with that assessment, first of all?

EVANS: I would, yes.

JOHNSON: Thank you. If we could go to tile 80, please.

If we scroll down, please.

This is Dr Ventress' note, if you recall --

EVANS: Yes.

JOHNSON: -- concerning her being called to review [Baby G] at 02.35 and saying that she'd had:

"... a very large projectile vomit, reaching the chair next to the cot and the canopy. Abdomen appeared discoloured, purple and distended. She was distressed and uncomfortable, red in the face and purple all over, and then an increased oxygen requirement followed by full feed, 45ml aspirated, large watery stool passed, after which abdomen slightly better. [Baby G] relaxed and [something]..."

EVANS: "Appeared."

JOHNSON: "... back to usual self."

Could we look at J26510, Mr Murphy, which was Ailsa Simpson's exhibit.

(Pause)

It was put on the screen during Ailsa Simpson's evidence.

(Pause)

MR JUSTICE GOSS: It's a photograph, isn't it?

MR JOHNSON: It is, my Lord, yes.

MR JUSTICE GOSS: I've found it in my note.

MR JOHNSON: Sometimes the old ways are the best.

MR JUSTICE GOSS: A handwritten note.

MR JOHNSON: If it's going to be a problem we'll come back to that, Dr Evans.

So going back to your report then, I'm looking at paragraph 15 in which -- so we're still in the report of 31 May 2018.

EVANS: Yes.

JOHNSON: You identified those notes of Dr Ventress. You moved on to deal with the second page of what we can see on the screen in front of us now, which is, if Mr Murphy could scroll down,

please, to note the fact that Dr Ventress had been called out of theatre because [Baby G] had gone apnoeic and dusky, that Dr Brearey was called in --

EVANS: Yes.

JOHNSON: -- as he reminded us this morning. That, on arrival, Dr Ventress had noted the fact that [Baby G]'s saturation was 50% in 100% oxygen. That she became pink and well perfused with the mask on and CPAP. That Dr Ventress had tried to obtain intravenous access.

Right, thank you. We've now found AS4. So if we could just go back to that, please.

(Pause)

Just to remind ourselves of the evidence of Nurse Simpson, who marked with those black circles the locations of the vomit. And you indeed were shown these a few months ago, weren't you, or shown this a few months ago?

EVANS: Yes. Recently, anyway.

JOHNSON: Relatively recently. Thank you. So if we could go back to the sequence, please, Mr Murphy. We may return to that photograph in due course.

Your paragraph 17 now, please, Dr Evans. You noted the fact, just at the bottom of the previous page, that [Baby G] was intubated at some stage between 2.35 and 4.40 in the morning. And you have reminded us, when we looked at the second page behind divider 8, page 6960, that the cross in the circle in the respirations column or part of the form indicates the fact that [Baby G] had been intubated. We can see that the first one of those is at 4 o'clock in the morning.

EVANS: Yes.

JOHNSON: You also noted, and I think it's just at the bottom of what we're looking at on the screen at the moment, if we can scroll down, please, keep going down -- it may be on the next page -- the fact that some bloodstained fluid came up the trachea --

EVANS: Yes.

JOHNSON: -- which we will return to in due course.

MR JUSTICE GOSS: That's on our screen now.

MR JOHNSON: Yes, thank you.

MR JUSTICE GOSS: Second line down.

MR JOHNSON: Thank you.

So:

"Intubated, size 3 ETT, 8 centimetres at lips, bloodstained fluid noted coming up from trachea/between cords."

If we can go to tile 107, please, Mr Murphy.

Did you note next in your report what you describe as the note of the profound desaturation of [Baby G] at 05.30?

EVANS: Yes.

JOHNSON: The fact that [Baby G]'s heart rate reduced to 60 and her saturations to 40%. That's about a third of the way up the page as we're looking up the page there, about half a dozen lines up.

EVANS: Yes.

JOHNSON: There's an inverted arrow. Heart rate down to 70, sats 40%, perfusion reduced, refill time 3 seconds.

That [Baby G] had desaturated when put back on the ventilator, which Dr Brearey told us about this morning; is that right?

EVANS: Yes.

JOHNSON: Then tile 117, please. Do you refer next to a further profound desaturation at 06.05 in the morning? It's further down. Do you see it there?

EVANS: Yes.

JOHNSON: [Baby G]'s heart rate dropped to 80%, was re-intubated, whereupon her heart rate increased to 120, her oxygen saturations remained at 50, despite increasing pressure from the ventilator.

EVANS: Yes.

JOHNSON: And this is where "thick secretions ++ in mouth" plus "blood clot at end of ETT" were noted by the treating physicians?

EVANS: Yes.

JOHNSON: Thank you. Further down the page, do we see the re-intubation at 06.15 hours?

EVANS: Yes.

JOHNSON: That the nasogastric tube was aspirated at that stage and 100ml of either fluid or air, or a mixture of both, depending on the evidence, was aspirated from the nasogastric tube?

EVANS: Yes.

JOHNSON: I think in your report you made the following note:

"It's not clear how much of the 100ml was milk, how much was air."

EVANS: Correct.

JOHNSON: That was your note on reviewing the medical records?

EVANS: Yes.

JOHNSON: Thank you. Did you then recount the fact that [Baby G] was given a paralysing agent, pancuronium?

EVANS: Yes.

JOHNSON: Her blood gases, which we know are recorded on the paper documents that we have behind divider 7?

EVANS: Yes, got that here.

JOHNSON: Thank you. And the fact that [Baby G] was transferred to Arrowe Park Hospital at about 3 am on 8 September?

EVANS: Yes.

JOHNSON: Next in your report did you review the observation charts which we've looked at up to and including the time of [Baby G]'s collapse?

EVANS: I have.

JOHNSON: So these are documents that we have referred to behind divider 7 at page 6960.

Did you also refer to the neonatal feeding charts --

EVANS: I did.

JOHNSON: -- from the early hours of 3 September up to the time of [Baby G]'s first collapse --

EVANS: Yes.

JOHNSON: -- at about 2 am?

EVANS: Yes.

JOHNSON: Sorry, some time after 2 am I should say, on 7 September.

EVANS: Yes.

JOHNSON: Those are or at least some of those documents are the last two documents behind divider 7 in the jury bundle.

EVANS: Yes.

JOHNSON: Did you record the fact that [Baby G] was being alternately fed, by and large, with the nasogastric tube and a bottle?

EVANS: Correct.

JOHNSON: So for examples of that, starting at page 7012, which is behind divider 8, which is the 5th and 6 September, do we see those facts recorded under the "route" column?

EVANS: Yes, we do. It's alternate nasogastric feeds alternating with bottle feeds, yes.

JOHNSON: And from time to time do we see that [Baby G] was fed via both routes at about the same time? So as an example on 5 September at 11 am and at 18.00 hours and indeed at 23.00 hours do we see partially fed by bottle --

EVANS: Yes.

JOHNSON: -- and partially fed by nasogastric tube during the same feed?

EVANS: Yes.

JOHNSON: Just so that we understand, and lest we've forgotten some of the evidence we received several working days ago now, how quickly does it take for expressed breast milk to get from the tube where it's poured by the nurse into the stomach of the child under the force of gravity?

EVANS: Well, it's a gravitational feed and this is a question better answered by a nurse --

JOHNSON: Right.

EVANS: -- because nurses are the ones who feed babies and I think we heard one of the nursing staff saying it could take anything from 5 to 20 minutes and that's fine, I would go along with that. It doesn't take a few seconds, it takes several minutes and it might take longer than -- some feeds than others.

JOHNSON: Yes. But using your long experience of such things, does a baby -- what happens if a baby's stomach is full?

EVANS: Once the stomach is full, it's full. Therefore if you give milk gravitationally, that's the end of it, you won't get any more milk trickling down from the syringe into the stomach because the stomach is full.

Therefore, if the stomach can only accommodate 45ml and you give, say, 55ml, then you're unlikely that the -- the baby is unlikely to absorb the final few millilitres of feed.

Clearly, stomachs are distensible, in other words they do expand to accommodate the volume of fluid they're receiving, but as a general principle if the stomach is full, then it's full and no more milk will run down the tube into the stomach.

JOHNSON: Under the force of gravity?

EVANS: Under the force of gravity, correct.

JOHNSON: As a matter of -- would there be a way of getting additional milk into the stomach if you couldn't get it in under the force of gravity?

EVANS: Well, the milk is given via syringe, where the plunger of the syringe is withdrawn, so it's the open end of the syringe that is connected to the nasogastric tube, which gets into the baby's stomach. But if you put the top end, in other words the plunger end, of the syringe into the syringe and press it down then you will force more milk or fluid through into the stomach.

JOHNSON: All right.

EVANS: You never do that because obviously you would overdistend the stomach. So therefore this is why it is so important that babies who are on nasogastric feeds are only fed by gravitational means. In other words, letting the milk drip through slowly.

JOHNSON: Yes. Thank you.

Did you refer next in your report to what we see on the final page behind our divider 7, namely [Nurse E]'s note at 02.00 hours on the morning of 7 September? I'm looking at your paragraph 21 now, Dr Evans.

EVANS: Yes, thank you. Yes.

JOHNSON: Did you refer to the fact that, in the nursing record, there was a note of the fact that there had been a large -- what was recorded as a "large projectile milky vomit" at 02.15?

EVANS: Yes.

JOHNSON: Followed by the words "continued to vomit ++"?

EVANS: Yes.

JOHNSON: Followed by:

"45ml milk obtained from NG tube with air ++"?

EVANS: Yes.

JOHNSON: And that:

"Abdomen was noted to be discoloured and distended. Colour improved few minutes after aspirating tube. Remained distended but soft"?

EVANS: Yes. There's a misprint there. It's got "discoloured and discoloured".

JOHNSON: Yes.

EVANS: It should be "discoloured and distended".

JOHNSON: Yes. Did you refer at your paragraph 23 to the blood gas results?

EVANS: I did.

JOHNSON: And for the jury's information, they are at pages 6971 to 6972.

So far as those results were concerned, if we can start with the results at 03.59 on the morning of the 7th. I'm not sure they actually appear in the table that we have, do they? I think you have made a note of them. But if anybody wants to write them on

to the blood gas results, I think -- were you looking for signs of an infection?

EVANS: Yes, yes, I was, because as we have heard infection is probably the commonest risk factor for any baby on a neonatal unit. So therefore one is always on the alert for evidence of infection.

JOHNSON: Yes.

EVANS: So I can go through those three...

JOHNSON: Yes, well, I think we heard from Dr Brearey this morning something of at least some of these readings, didn't we --

EVANS: Yes.

JOHNSON: -- in his evidence? At 3.59 in the morning the CRP reading was less than 1?

EVANS: Correct.

JOHNSON: The WBC, what's that?

EVANS: That's the whole blood count-- sorry, that's the white blood count, but it's the total white blood count.

There are different types of white cells, so the main two are neutrophils and lymphocytes, so therefore the total white count is 10.1, which is fine. The neutrophil count -- the neutrophils are the white cells that increase first during or as a result of infection.

So the neutrophil count of 1.4 is perfectly normal and tends to rule out infection.

JOHNSON: Right. So just taking a step back and summarising the position from the blood test at 03.59, so in other words a couple of hours or two and a half hours, even -- sorry, no, an hour and a half after the vomit, the projectile vomit, did those blood test results show any evidence of infection?

EVANS: No.

JOHNSON: By 14.18, later that day, so about 10 hours later or so, was there any change to those results?

EVANS: Yes, there was. The CRP is now 28, so that is an increase and that could be interpreted as a marker of infection. It's not particularly high, but the important thing is it's gone up and

it's 28. The total white cells, 11.2, so no difference between 11.2 and 10.1. But you also have an increase in the neutrophil count to 6.5.

JOHNSON: Yes.

EVANS: And again, the key thing there is that the neutrophil count has increased. A value of 6.5 is not particularly concerning, but in conjunction with a CRP of 28 it would suggest that the neutrophil count has increased and therefore it's an indicator of infection. So this is -- yes, so this is 10/12 hours later.

JOHNSON: Yes. By 22.53, had the CRP count or value risen to 106?

EVANS: That is correct. So therefore this is a very significant increase, consistent with infection.

JOHNSON: Yes. Now I want to move on, if we can, please, to the observations section of your report, please, Dr Evans.

That's paragraph 30.

EVANS: Yes.

JOHNSON: You refer there to [Baby G]'s remarkably small size.

EVANS: Yes.

JOHNSON: You describe her as -- we discussed before the adjournment that she was "at the margins of survival" --

EVANS: Correct.

JOHNSON: -- when she was born.

EVANS: Yes.

JOHNSON: And you thought it was a reflection of the skill of the staff at Arrowe Park Hospital that she survived.

EVANS: Yes.

JOHNSON: Did you look at the care that [Baby G] received at the Countess of Chester between being admitted there in August, 14 August, and collapsing some time after 2 am on 7 September?

EVANS: I did.

JOHNSON: Could you find any evidence in the medical notes that during her time at Chester, [Baby G] had been unwell up to the point of her collapse?

EVANS: No. Her condition was stable. She was requiring oxygen because she had chronic lung disease and, if we recall the discharge summary from Arrowe Park, there were only two issues there. One that she has chronic lung disease and the second active issue was establishing feeds.

JOHNSON: Yes.

EVANS: So those were the only -- so therefore given her start in life, this was an extremely satisfactory state.

JOHNSON: So given her breathing issues, just going back to our paper documents behind divider 7, what do those documents at -- the first two documents at 6959 and 6960 tell us so far as those breathing issues were concerned prior to her collapse?

EVANS: They are all extremely -- they're indicative of a baby who's got chronic lung disease, who is stable and would be expected to continue to remain stable until she would be well enough to go home, probably after she would have been fully established on bottle feeding.

JOHNSON: Yes. And so far as establishing her on bottle feeding is concerned, we have a snapshot of that in the final two documents behind divider 7 in the sense of we have the full day on the 5th, we have the full day on the 6th, and we have the single feed prior to collapse. But what do those documents tell us so far as the establishment of that regime was concerned?

EVANS: Again, all of these are very satisfactory findings.

She's 2 kilos by now, so that's a fair weight, slightly less than you'd expect for her gestational age, but satisfactory, and she is coping with bottle feeds every other feed.

JOHNSON: Yes.

EVANS: So you know, that is satisfactory. And what you would normally find is that over the -- you know, over the next week or two, she would be given more feeds by bottle and fewer feeds by nasogastric tube until she was well enough to go home, and she would probably have gone home still requiring oxygen supplements.

JOHNSON: If the jury wouldn't mind keeping open page 7013, and if Mr Murphy would put back up on the screen exhibit AS4, please, which is a photograph.

At paragraph 32 of your report of 31 May, Dr Evans, you refer specifically to the entry made in the -- by Dr Ventress.

EVANS: Yes.

JOHNSON: And you drew certain -- so you quoted it and we've just looked at it. But you expressed a concern in your paragraph 33. Could you tell the jury what your concern is and, in particular, by reference to what [Nurse E] has written there on page 7013?

EVANS: Well -- 7013, right. We'll start with what [Nurse E] said because she says at 02.00 hours [Baby G] had EBM, expressed breast milk, with fortifier, which is extra calories, less Gaviscon, which is given commonly to little babies, and was given 45ml of feed via nasogastric tube.

The column re-vomit aspirate says pH 4. PH 4 means acidic, therefore there's acid in the stomach, that's what she says.

Then I think I'll read my paragraph 33.

JOHNSON: Please.

EVANS: Paragraph 33 relates to the fact that she'd had this projectile vomit and I quote --

JOHNSON: And we can see in pictorial form on the screen where the vomit landed, can't we?

EVANS: Yes. Let's mention that.

JOHNSON: And how would a baby be lying in that contraption?

EVANS: Presumably, the baby would be lying with its feet towards this end of the photograph and its head at the top end.

JOHNSON: That was the evidence, certainly.

EVANS: Okay. There are three black circles. The one in the cot obviously indicates that the baby was sick and had vomited in the cot. Babies do vomit and therefore the fact that the baby vomited in a cot would be worthy of note but not unusual.

The second circle is the one between the chair and the cot on the floor. For a baby of 2 kilos to vomit that far is quite remarkable because on the whole, when babies vomit, they tend to vomit over their babygros, you know, and over whoever's holding them if they are held by someone. But that is as far as it goes unless they have a condition called pyloric stenosis, that Dr Brearey mentioned this morning.

JOHNSON: Yes.

EVANS: And he said projectile vomiting is something he's only seen with pyloric stenosis and the same applies to me as well. Pyloric stenosis is a condition that turns up and a baby will vomit quite far away.

But even more astonishing is the vomit that ended up on the chair. Now, that is several feet away. I can't recall a baby vomiting as far as the floor, but certainly I can't recall a baby vomiting that distance and it was described correctly as projectile vomiting and that is quite extraordinary.

So therefore there is something very, very unusual going on here for [Baby G] to show up in this way with this vomiting and, on top of that, of course, they have noticed that her abdomen was distended. Well, you know, small babies don't have muscles in the abdomen, therefore if you put a lot of fluid or a lot of air into the stomach, the abdomen will swell.

JOHNSON: Yes.

EVANS: And as well as vomiting -- and you can't measure accurately the volume of vomit because it'll be all over the floor and all over the chair -- on top of that the nurse staff aspirated -- in other words they got the syringe and extracted 45ml of feed from the nasogastric tube. This was in addition to the milk she had vomited.

JOHNSON: Right. Let's just -- sorry to stop you, but if Mr Murphy could help us by reminding us of what Lucy Letby wrote down at tile 79, please. If we can go to the original note behind the tile, please.

So:

"[Baby G] had large projectile milky vomit at 2.15, continued to vomit ++. 45ml milk obtained from NG tube with air ++. Abdomen noted to be distended and discoloured. Colour improved few minutes after aspirating tube, remained distended but soft. Reg Ventress asked to review. To go nil by mouth with IV fluids."

So just going back to your report then, please, Dr Evans, with my apologies for stopping you and referring the jury back to Lucy Letby's note, could you continue your explanation?

EVANS: Well, if I continue on my paragraph 33, really.

JOHNSON: Yes.

EVANS: So the entry from (inaudible) makes it clear the member of staff aspirated 45ml of feed from the NG tube in addition to the milk she had vomited. There can be only one explanation: [Baby G] had received more, far more, than 45ml of feed down the NG tube before she vomited at 02.15 hours. She may also have received a bolus of air from the feeding syringe used for feeding. This caused the abdominal distension, the distress, the change of abdomen colour and the vomiting.

So therefore, just to add to that, just one thing, really. So [Baby G] must have received far, far more milk down the tube. She probably had more air as well. And given that it had caused the abdominal distension, et cetera, I don't think this got down by gravity, so the mechanical explanation is that the plunger end of the syringe must have been put over the syringe and the milk forced down, squirted down the tube, if you like, using a syringe, and this caused the baby -- would have caused the abdominal distension to start off with, then it would have caused the baby distress and, of course, she would have vomited because of the gross overdistension of her stomach.

JOHNSON: So given that you've told us that in the absence of pyloric stenosis -- well, let's deal with pyloric stenosis first before I ask you this question. Why do you exclude that as a possibility for what happened?

EVANS: Well, pyloric stenosis is something that occurs with babies 6 to 8 weeks of age or thereabouts and it doesn't occur and disappear, it requires a surgical procedure to treat the overgrown muscle at the bottom of the stomach.

JOHNSON: Okay.

EVANS: Therefore if she had pyloric stenosis the vomiting would have continued until somebody took her to theatre and operated on her.

JOHNSON: Can we exclude that as a possibility?

EVANS: We can exclude pyloric stenosis completely.

JOHNSON: You have told us that baby of this size and age would be incapable of producing the amount of force required to vomit out of the cot on to the floor and beyond on to a chair.

EVANS: Mm.

JOHNSON: So what's the physical explanation for how this baby undoubtedly did manage to do that?

EVANS: Well, she -- well, right. The whole of the gastrointestinal system has a series of muscles, from the mouth all the way through. A particular kind of muscle is called smooth muscle. Muscles only go one way, therefore milk will go from the mouth down through the oesophagus, through the stomach, through the intestine and then out the other end. So it's one-way traffic.

The only time this does not work is if the baby's compromised by something. Okay? So in this situation the baby was compromised by receiving a large volume of fluid into the stomach, and in that situation, the stomach muscles would contract and the contraction of the stomach muscles would lead to the baby vomiting.

This is not unique to babies. If anybody drank too much fluid too quickly, you'd end up with a similar pattern of vomiting. So therefore the mechanism of it is straightforward.

JOHNSON: Is it like putting a large amount of air or fluid, or a combination, into a balloon to stretch the balloon and then letting your fingers off the end in effect?

Is that the sort of idea?

EVANS: No, I'd make it simpler than that.

JOHNSON: Go on.

EVANS: I'd make it simpler than that. You can't be flippant in this. But if an adult drank a large volume of liquid too quickly they would probably vomit --

JOHNSON: Right.

EVANS: -- because there is a rate at which liquid can go from stomach to intestines through to the intestine, therefore any indulgence of drink leads to vomiting.

JOHNSON: Okay.

EVANS: The stomach muscles contract and it all comes out.

JOHNSON: All right.

EVANS: So this is what happened to this little baby.

JOHNSON: Thank you. Moving on to your paragraph 35, Dr Evans.

Did you look at the X-rays of [Baby G] and, in particular, one that was timed just before 5 am at --

EVANS: I did. Now, I emphasise I'm not a radiologist, so we do have a radiology opinion, but obviously I'm familiar with looking at X-rays of the abdomens and chests of little babies, so this is about the limit of my radiology competence as it were. And the X-rays shows chronic lung disease and a great deal of air in the abdomen, yes.

JOHNSON: We'll leave that for the radiologists in due course.

Thereafter, so far as this report was concerned, were there -- did you come to any conclusions about what happened to [Baby G] following this unusual vomit at anything between 2.15 and 2.30?

EVANS: Yes, I did. Her condition over the next few hours was incredibly unstable. I'll explain it in more detail, but this is a time when she's experienced a significant amount of oxygen deprivation. There are recorded values of oxygen saturations 40% and 50% and also bradycardia, heart rate down, and also lowish blood pressure. So therefore, getting [Baby G] back to where she was before 2 am turned out to be extremely challenging and extremely difficult. They did get her round because obviously she survived, but she suffered sufficient oxygen deprivation to cause significant irreversible brain damage.

JOHNSON: Yes.

EVANS: And her resuscitation was quite difficult. I've heard Dr Ventress' testimony and Dr Brearey. So it was quite difficult for all, and I just mention one or two things.

The first thing that Dr Ventress mentioned was when she tried to intubate the baby, in other words you put a laryngoscope into the back of the throat to get a tube in, an endotracheal tube, she noticed blood. She noticed blood not just at the back of the throat but the other side, in other words on the lung side of the vocal cords.

JOHNSON: Yes.

EVANS: So in other words, there was bleeding. Now, this doesn't mean -- this doesn't... The fact there was blood beyond the vocal cords, in other words towards the lungs, doesn't mean that the bleeding came from beyond the cords, it could be that the bleeding came from the upper -- from the back of the throat and, you know, and then trickled down through the cords. You can't say one way or the other.

But certainly there was bleeding there and the important thing about the bleeding is that this was found at the initial

resuscitation. So in other words although they had tremendous difficulties with ventilation, the bleeding was not noted an hour later or with a second intubation or with a third intubation.

And the significance of that is this: that the bleeding was there from the first time that the baby was -- from the first occasion that resuscitation with intubation was attempted.

And we know that [Baby G] did not have a bleeding disorder, in other words she was not at increased risk of haemorrhage or bleeding. So therefore, the bleeding was present from the beginning. And I think Dr Harkness said the same thing: there was blood at the back of the throat, so there was bleeding at the back of the throat from more or less the time that [Baby G] crashed/collapsed.

JOHNSON: Is this the same sort of bleeding we've seen so far in any other case so far as you can tell or is it different?

EVANS: Right. Well, we've seen this before, but much worse in little [Baby E]. That's case number 5, the first of the twins. But the bleeding that we found there was much worse, he lost a third of his blood. So the bleeding here was not major. But the fact that it was present is not something that one would normally expect and it cannot be explained on the basis of vomiting only.

JOHNSON: No. The possibility of pulmonary haemorrhage, so bleeding from the lungs, do you regard that as being a realistic source of the blood in this particular case?

EVANS: No, I do not. Pulmonary haemorrhage is a killer and if the haemorrhage was in the lungs itself, she's unlikely to have survived, quite frankly. But she certainly wouldn't have picked up -- although she took several hours to pick up, I don't think she'd have picked up in such a short period of time. So I don't think pulmonary haemorrhage was a factor in this collapse at all.

JOHNSON: So far as the issue of infection is concerned, from your interpretation of what happened did you regard infection as being a credible explanation for [Baby G]'s vomiting and collapse some time after 2 am?

EVANS: No, not at all. [Baby G]'s infection, in my opinion, occurred after the collapse. I think it is worth explaining this in some detail because it applies -- it's applied to previous babies and it will apply to babies we're going to be discussing later.

The key thing is that when babies start to sicken for an infection, nursing and medical staff in baby units are alert to subtle changes. So the oxygen requirement may go up, the oxygen saturation may go down. The breathing may become a little bit irregular.

They generally don't -- they're not quite as well as they should be. There's none of that. There's none of that. There is this complete stability. You might get pooling of blood -- sorry, pooling of milk in the stomach. That did not occur. We know that she was on 45ml every 3 hours and all of it was going through either by bottle or by NG tube.

Therefore there were no markers of infection clinically at all. And then 2 hours, nearly 2 hours after her collapse, the blood tests we've discussed showed a CRP of less than 1 and a neutrophil count of 1.4. Normal.

Now, we know that CRP is not always increased at the presentation of infection, but it is in -- it is more likely than not to be increased. But the other thing that's important in [Baby G]'s case is that her infection, if I could put it that way, was very CRP relevant. In other words, her CRPs really shot up. So 12 hours later, it was 28, which is not particularly high.

20 hours or so later, it was 106, and I think there was a value of over 200 later on after she'd been transferred.

So therefore, none of her clinical features indicate infection. None of the blood tests indicate infection.

So in my opinion, the infection occurred after the resuscitation, most likely, and this is not a criticism by the way, most likely in association with all the efforts they made to get her going, you know, to save her life, really. So there we are.

JOHNSON: Thank you. Moving on, if we may, and I'm moving on, Dr Evans, to a later report of yours, please, of 17 October 2021 and I'm looking specifically at your paragraph 7, which is, I think, your page 5, if your print is as mine appears on the screen.

EVANS: My response to the 10 questions?

JOHNSON: Correct, yes. I think you were asked to consider Dr Ventress' suggestion that [Baby G]'s initial collapse, when she projectile vomited and 45ml of milk was aspirated from her stomach, you were asked to consider whether that was consistent with being the product of an infection.

EVANS: With respect to Dr Ventress, no, I don't agree with that. I think the infection occurred afterwards.

JOHNSON: Yes. Is that for the reasons that you have already explained?

EVANS: Yes, yes, yes. And of course, infection would not cause a baby to vomit halfway across the nursery. And where would the extra fluid come from? Because even after vomiting, they aspirated 45ml of milk from the stomach, so therefore she had only been fed 45ml. So if you are fed 45ml, some of the milk will have already gone through the stomach into the duodenum, you're not going to aspirate every millilitre anyway because, you know, you can't aspirate 100%, but they still aspirated 45ml.

They also aspirated air. Where on earth did the air come from? Plus all the vomit on the chair and on the floor and everywhere else. So therefore, she must have had far, far more volume of milk than 45ml.

JOHNSON: All right. Now, one of the things you were asked to deal with on the issue of air was something that Lucy Letby told the police when she was interviewed.

EVANS: Ah, right.

JOHNSON: I'm now looking at your paragraph 7 at page 7 of your report, it's the same report, 17 October. So the suggestion made by Lucy Letby in her interview was that an explanation for there being a lot of air in [Baby G] was that when babies vomit they swallow a lot of air.

EVANS: Well, they don't. They don't. I mean, you'll vomit -- air will come out with liquid. It won't go back in.

JOHNSON: Therefore if a baby doesn't swallow large quantities of air, what conclusion did you draw as to how the air got there that was aspirated with the milk?

EVANS: Right. As far as the initial one is concerned, I think as well as having quite a lot of additional milk pushed down into the nasogastric tube, I think she had excess air as well down that tube, and that contributed to the abdominal distension. So she had air down the tube and excess milk down the tube.

JOHNSON: Yes.

EVANS: Yes.

JOHNSON: And so far as Dr Brearey's evidence -- we have had differing versions of the 100ml aspiration from Dr Ventress and Dr Brearey as to whether or not it was air or whether it was fluid, possibly milk. But would infection account for either as far as you are concerned?

EVANS: No, no. I have never seen a baby with an infection present in this way. You know, it's just not the way they present.

JOHNSON: All right. I think at a later stage -- and I'm looking now, Dr Evans, at your report of 22 April 2022, 22/4/22 -- you were asked about whether or not it was normal for babies who are fed via NGTs to vomit at all.

EVANS: Well, they don't.

JOHNSON: It's your paragraph 4.

EVANS: Yes, they don't. Because what -- you see, it has been explained before, but I'm not sure it's been explained clearly enough. When you have a baby on nasogastric feeds, the nurse will put a syringe before the feed -- before the feed the nurse will put a syringe on to the top of the nasogastric tube and aspirate, in other words suck back from the syringe to see if there's any residual milk there.

They do it for two reasons: first of all, to see if there's residual milk because if the milk -- if there's a fair bit of milk from a previous feed that has not gone through, then you need to be careful about giving more milk. The second reason they aspirate the tube is to measure the acidity of the stomach content, and the reason they do that is to ensure that the end of the nasogastric tube is actually in the stomach. Okay?

The stomach has acid. Nasogastric tubes can come out and can go down the wrong way, go into the lung, so the last thing you want to do is to give milk into the wrong orifice, into the lung. Therefore, the reason that they measure pH before each feed is to ensure that the tip of the nasogastric tube is actually in the stomach.

If the baby is on bottle feed then you don't need to do that because obviously the baby will swallow normally and the milk will go down the right hole, into the stomach. But with nasogastric feeding you must ensure as a nurse that the nasogastric tube tip is in the stomach and this is why you measure its pH and a pH of 4, acid, tube in the correct place.

JOHNSON: Thank you. Can I turn finally, please, to your report of 22 April 2022 and to really the conclusion of that report, please. I'm looking at paragraph 12.

EVANS: I'll just read it. This is my last paragraph:

"Inserting an excessive volume of fluid/milk via nasogastric tube with or without associated air cannot occur accidentally. A professional member of staff, nursing or medical, who gives a small baby an excessive volume of milk places that infant in harm's way. It places the infant at risk of vomiting and the complication of aspiration pneumonia. Excessive volume of fluid in the stomach also interferes with diaphragm movement, splinting the diaphragm..."

Meaning the diaphragm can't move up and down:

"... leading to the risk of respiratory distress, respiratory failure and cardiorespiratory collapse."

So that was my final...

JOHNSON: So the diaphragm is the very strong muscle under the lungs; is that right?

EVANS: Correct, yes.

JOHNSON: And as the diaphragm moves, it reduces pressure in the lungs, which draws in air?

EVANS: Correct.

JOHNSON: Is that right?

EVANS: Correct.

JOHNSON: The effect of the stomach being overfull of air and/or fluid has what effect on that movement of the diaphragm?

EVANS: If the stomach is full of fluid, the diaphragm cannot move down. The diaphragm needs to move down to suck air in. If the diaphragm cannot move down because the stomach is full of air, then the baby cannot receive air and oxygen into its lungs, and it'll lead very rapidly to oxygen deprivation, oxygen reduction, in other words oxygen saturations falling, followed by bradycardia, in other words heart rate falling, followed by collapse.

So that's the mechanism of a sequence of this nature.

I think we'll hear about that at a later time with another baby. But as far as [Baby G] is concerned, this is what compromised her.

MR JOHNSON: Thank you, Dr Evans. Would you wait there, please, for some further questions?

Cross-examination by MR MYERS

MR MYERS: Dr Evans, the way that you described [Baby G], her condition at the time of her birth, was that she was born on the margins of survival.

EVANS: Yes.

MYERS: That's the expression you used.

EVANS: Yes.

MYERS: She was extremely preterm, wasn't she?

EVANS: "Margins of viability" was the term I used, actually. She was very preterm, yes.

MYERS: Right. I'm actually looking at your second report, the main one we've looked at, Dr Evans, 31 May 2018.

Page 11 of 16. It's 31 May 2018 report.

EVANS: "Margins of survival", yes.

MYERS: Yes, the expression you used was "margins of survival", wasn't it?

EVANS: Yes. I used viability somewhere else I think, but anyway.

MYERS: Right.

EVANS: Same thing.

MYERS: She was extremely preterm, wasn't she?

EVANS: Correct.

MYERS: And she was a very low birth weight?

EVANS: Yes.

MYERS: And in the initial period at Arrowe Park a lot of work had to be done just to get her through that period, didn't it?

EVANS: Absolutely.

MYERS: By the time that she came to the Countess of Chester Hospital, she was stable on CPAP, wasn't she?

EVANS: Correct.

MYERS: And so it could be said that, relative to where she began, she was doing very much better, wasn't she?

EVANS: Yes, indeed.

MYERS: Do you agree she was still a little baby that would be prone to infection?

EVANS: Yes.

MYERS: With regard to the events of 7 September, which is what we're looking at now, when you came to consider this -- can you confirm how you put this, please -- if we look at your paragraph 41 at page 14 of 16, you give your opinion. I just want to look at this and then look through where we are with the evidence now.

You say:

"In my opinion, [Baby G] was treated inappropriately at or around 02.00 on 7 September. The aspiration of 100ml of milk and air plus the projectile vomiting is entirety consistent with some action where [Baby G] was given an excessive volume of milk via her NGT. [Baby G] probably received a volume of additional air via the NGT as well."

Then you go on to say:

"In [your] opinion, an individual experienced in working with small babies would have known that such an action would have placed the infant in harm's way."

And that was the principal mechanism you identified, wasn't it?

EVANS: Yes.

MYERS: When you did that, and when you considered your reports, and looked at what lay behind the projectile vomit and what follows, you worked on the basis that [Baby G]'s tummy would have been empty or almost empty at the time of the 2 am feed, didn't you?

EVANS: Correct.

MYERS: You worked on that basis because what you understood to be the case was that the nurse responsible for [Baby G] would have aspirated her stomach of all milk, if there was any, before a feed took place?

EVANS: Correct.

MYERS: We have heard the evidence of [Nurse E] and we now know that [Baby G]'s tummy was not aspirated before the feed at 2 am, don't we?

EVANS: No, we don't, actually. You cannot measure pH unless you aspirate the stomach. The way you aspirate -- the way you measure pH is you put the syringe in the -- a syringe on top of the nasogastric tube, see if you can get some acid out or some fluid out and measure the pH.

Therefore we know for certain that she aspirated the stomach because otherwise she could not have written down pH 4. Okay?

MYERS: We have all heard [Nurse E]'s evidence.

EVANS: I heard it as well.

MYERS: Yes, and what she said was that she took sufficient to be able to measure the pH --

EVANS: Yes.

MYERS: -- which didn't require very much.

EVANS: No.

MYERS: But she said that in a baby of [Baby G]'s age she would not have aspirated the stomach contents to see what was there. She simply would not have done.

EVANS: Okay.

MYERS: You heard that, didn't you?

EVANS: Yes.

MYERS: And she agreed that she could not -- therefore it couldn't be said how much milk was or wasn't in [Baby G]'s stomach by the time of the 2 o'clock feed. That's the effect of her evidence, isn't it?

EVANS: Well, no, no. This is far too simple. You see, milk is not acidic. Milk is neutral. Therefore if you aspirate anything and you end up with a pH of 4, then you won't have any milk

there because milk will tend to neutralise the acid in the stomach. So if you've got a pH of 4, which is pretty acidic, then you can't have had any milk there. Okay? That's basic chemistry, by the way.

MYERS: Dr Evans, we have heard [Nurse E] say that the volume -- the pH doesn't bear upon how much milk was in the stomach, she was clear about that, you heard her evidence on that, didn't you?

EVANS: Well, my evidence is this: if the pH is 4, it's acidic and it's indicative of acid in the stomach. If there was a significant amount of milk mixed up with the acid, mixed up with the stomach content, then the pH would not be 4. That is my evidence and that's what I'm sticking to.

MYERS: Now, the reason I suggest that you are disputing this is that your theory as to harm is based upon the stomach's contents having been aspirated before the feed. That's what your theory is based upon, isn't it?

EVANS: No, it is not, actually. No, it is not. It is based on extraordinary presentation. You have 45ml aspirated from the stomach after the vomit. And the vomit has spread itself over the canopy, over the floor and over the chair. And when the -- so even after the vomiting, even after the vomiting -- goodness knows how much vomit you need to spread yourself over three areas of a nursery -- on top of that there was an aspiration of 45ml, so even if -- 45ml plus air. Therefore there has to have been a significant amount of additional milk plus air to explain what happened to the little baby at 2 o'clock in the morning. That's it.

MYERS: One moment, please. When I said that you have relied upon the nurse aspirating it, let's just be clear about how you base your evidence in your reports. Can you look at page 5, please, of the report dated 17 October 2021?

What you say, paragraph 7(a), when dealing with the aspirates -- and I am talking about what you say about the nurses:

"A nurse will aspirate the nasogastric tube of a baby prior to giving the next feed. This ensures the stomach is empty."

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

EVANS: Yes.

MYERS: And that is something you're basing your findings upon, that [Baby G]'s stomach must have been empty at the time of the 2 o'clock feed, isn't it?

EVANS: Her pH was 4. 4 is acid. If there was milk in the stomach, the pH would not be 4.

MYERS: Let's go through all the evidence of what the nurses say. You say the nurse will have aspirated the NG tube, don't you?

EVANS: I'm here to give my own evidence, okay?

MYERS: And in your next report, 22 April 2022, if you look at page 2 of that, please, Dr Evans --

EVANS: Sorry, where?

MYERS: Page 2 of 6, your report of 22 April 2022. Page 4904 of our statements, my Lord. It's page 2 of your report.

EVANS: Right.

MYERS: You said this, paragraph 4:

"It is unusual for babies who receive their feeds via NG tube to vomit. The attendant nurse aspirates the NG tube prior to giving the next feed to ensure that the stomach is empty."

EVANS: Correct.

MYERS: You base what you say about [Baby G] projectile vomiting in part upon her having had her stomach emptied by aspiration before the 2 o'clock feed, don't you, from what you said there?

EVANS: The stomach was empty apart from one millilitre maybe, enough to measure pH. There would have been no milk in her stomach when [Nurse E] gave her her 2 am feed.

That is my evidence, that is my opinion.

MYERS: That's what you're saying. But so there can be no confusion, did you hear [Nurse E] give her evidence?

EVANS: I did.

MYERS: And did you hear her say that you wouldn't aspirate the stomach contents at every feed because that would mess with the digestion? You might do it once or twice in a shift potentially. Did you hear her say that?

EVANS: I did.

MYERS: And did you hear her asked:

"Question: If there's no particular issue with [Baby G] up to the 2 o'clock feed you'd have no reason, for instance, or anyone else, to start taking out all the contents of her stomach to check how she was doing, would you?"

To which she said:

"Answer: No, you wouldn't do that with a baby like this."

EVANS: No, she was -- sorry, we've been through this. Over the past several days she'd had 45ml of milk, either by NG tube or by bottle, and she'd coped well. And I also heard [Nurse E] say that after the feed she went for her break and she would not have gone for a break if she was worried about a little baby. So that's what I heard and therefore I am totally satisfied with my professional opinion regarding the content of this stomach at 2 o'clock in the morning.

MYERS: So do you base your opinion upon the stomach having been aspirated before that feed?

EVANS: No, I base my opinion on the fact that she vomited, projectile vomited something, most of us have never heard of before, in the situation of this nature, and the amount of vomit plus the amount of aspirate was massive and can only be explained -- I put in my report that there's only one explanation. There aren't very many medical conditions for which there is only one explanation. This is one of them. Therefore she had a huge amount of milk plus air just before this vomiting occurred.

MYERS: Can I be clear by asking this question and ask you to answer the question, Dr Evans, and I'll move on: do you base what you say on the understanding, at least in part, that the stomach contents must have been aspirated by the time the 2 o'clock feed took place?

EVANS: I base my opinion on the fact that the stomach was empty.

MYERS: You base it on the stomach being empty?

EVANS: Yes.

MR JUSTICE GOSS: The last way in which you put that question added "at least in part". Previously you had not had "at least in part". You were saying it was based on the stomach having been aspirated.

MR MYERS: Yes.

MR JUSTICE GOSS: You're now putting it -- it's suggested that at least in part, do you base your opinion on the stomach having been aspirated before that feed at 2 o'clock?

EVANS: A question for me?

MR JUSTICE GOSS: For you, yes.

EVANS: Sorry.

MR JUSTICE GOSS: Sorry, Dr Evans, yes. You see, the question was put in a slightly different format then.

EVANS: Oh no, my opinion is, I think, fairly straightforward.

The stomach was empty of milk at the -- just before the 2 o'clock feed. And whether it was empty of milk because [Nurse E] did not aspirate -- you see, what [Nurse E] said was:

"I wouldn't normally aspirate all the milk."

That's fine. That's completely different to saying, "I did not aspirate the stomach fully at 2 am". She didn't say that because I heard what she said. She said that's what she would normally do. Now, that's what nurses do.

So therefore this was a stable baby, tolerating 45ml of milk every 3 hours, make sure the pH is acidic, that's fine. And therefore she -- therefore the stomach was empty because it was empty but I base my opinion on the fact, you know, that the projectile vomiting, my Lord, was a result of her having this massive additional amount of milk just before the vomit, plus air as well, probably, or almost certainly.

MR MYERS: I'm not going to rehearse [Nurse E]'s evidence again, my Lord, we have heard that, we can go back to that to see precisely what she said.

MR JUSTICE GOSS: I wasn't asking about that. I had understood, because previously it had been put, as I understood it, and maybe I misunderstood it, to Dr Evans that he was basing his opinion purely on the fact that [Nurse E] had aspirated before the feed.

And then you said "at least in part". I just wanted to be clear what Dr Evans' answer to that question was.

MR MYERS: I'm grateful to Mr Maher for showing me this.

I had put to Dr Evans:

"You base what you say about [Baby G] projectile vomiting in part upon her having had her stomach emptied by aspiration before the 2 o'clock feed?"

MR JUSTICE GOSS: Yes. That was much earlier on. But then the question just immediately before, I think, you modified it slightly.

MR MYERS: I'm trying to give Dr Evans the opportunity of either way, if it plays any part, and we say he's saying it doesn't.

We have the evidence of [Nurse E] and I'm not going to repeat all of that. We can return to that in due course. We hear what you say about it, Dr Evans.

What you have done is you have given a description of force feeding by using the plunger of the syringe to press into the body of the syringe, haven't you?

EVANS: Yes, I have.

MYERS: You said you press the plunger and you force it down the tube.

EVANS: Yes.

MYERS: That bit of description is something you've added to what you say today, isn't it?

EVANS: It's not in my original report.

MYERS: Well, we've got six reports. It's not in any of them, is it?

EVANS: Okay. You've heard it now.

MYERS: Just wondering, have you added that, Dr Evans, because you're thinking, well, maybe if there was more milk in there and it hadn't been aspirated, I'll have to change it and suggest a mechanism to force it in? Is that what you have done?

EVANS: No, I haven't.

MYERS: In terms of aspiration, when nurses aspirate, they may draw out liquid, mightn't they?

EVANS: Correct.

MYERS: They may draw out air; do you agree with that?

EVANS: One or two millilitres maybe.

MYERS: Do you agree that a large quantity of air can be withdrawn?

EVANS: You're more likely to get a large quantity of air... It depends how much air you've put in in the first place, really.

MYERS: We know that 100ml of aspirate was withdrawn round about 6.15, don't we?

EVANS: We do -- sorry?

MYERS: 100ml of aspirate, something, was withdrawn round about 6.15, wasn't it?

EVANS: Correct.

MYERS: You have seen the notes don't clarify what was, do they?

EVANS: That's true.

MYERS: You have seen what Dr Brearey had to say this morning?

EVANS: I did.

MYERS: Did you hear what Dr Ventress said about that?

EVANS: I did.

MYERS: And her view was it was probably air.

EVANS: Yes, I did.

MYERS: When you dealt with your conclusions with the prosecution, and just the final part that you were dealing with, Dr Evans, you were asked about paragraph 12 in your report of 22 April 2022. So let me just ask you about that, please. Page 3 of 6. I'm going to ask Mr Murphy, if he would, please, to put up tile 80. The first page of tile 80. It has two pages, we can start at the first page.

If we scroll down, please. Thank you very much.

Leave that there for the moment.

You had described in your paragraph 12 the following and I'm going to remind us what you say and then ask some questions about it. You said:

"Inserting an excessive volume of fluid/milk via a nasogastric tube with or without associated air cannot occur accidentally. A professional member of staff, nursing or medical, who gives a small baby an excessive volume of milk places that infant in harm's way."

You give [Baby G]'s weight on the date:

"It places the infant at risk of vomiting and the complication of aspiration pneumonia. An excessive volume of fluid in the stomach also interferes with diaphragm movement, splinting the diaphragm, leading to the risk of respiratory distress, respiratory failure and cardiorespiratory collapse."

Yes?

EVANS: Yes.

MYERS: That's what you said. And I take it what you are doing there is linking excessive volume of fluid down the NGT to ultimately respiratory distress, respiratory failure and cardiorespiratory collapse; is that what you're doing?

EVANS: Yes, that's correct.

MYERS: In fact, we know that the later collapse and desaturations come after [Baby G] had vomited, didn't they?

EVANS: I didn't look at the later collapse during this. I'm happy to discuss that when we discuss it later, but I'd rather stick with this for the time being.

MYERS: It's my fault for not being clear. We know that as the morning proceeded, from 04.40 on this note, which pre-dates that, as we go through that morning there are a succession of incidents, aren't there?

EVANS: Yes.

MYERS: Desaturations, aren't there?

EVANS: Yes.

MYERS: We know that they commence some time after [Baby G] had vomited, don't they?

EVANS: Yes.

MYERS: And if we just scroll down this page just to have a look down, if you would, Mr Murphy -- can you just go back up, it's

the bottom part of the page -- we have what Dr Ventress reported, rather recorded, that had been reported to her, that:

"There had been a very large projectile vomit reaching the chair" --

EVANS: Yes.

MYERS: -- "next to the cot and canopy. The abdomen appeared discoloured, purple and distended. [Baby G] was distressed and uncomfortable, red in the face and purple all over.

Oxygen to the IL via nasal cannula. Desaturated to 80s but [?] okay."

It says:

"Full feed (45ml) aspirated. Large watery stool passed after which abdo slightly better and [Baby G] relaxed" --

EVANS: Yes.

MYERS: -- "and appeared back to usual self."

EVANS: Yes.

MYERS: So that is the position when Alison Ventress attended round about 2.30?

EVANS: Yes.

MYERS: If we go over the page, we can see there was a plan to cannulate with IV fluids, unfortunately delayed due to the delivery of another preterm baby.

EVANS: Yes.

MYERS: Do you recall Dr Ventress explaining that [Baby G] seemed stable enough for her to leave her at that point --

EVANS: Yes, I do.

MYERS: -- with that plan? The problems that then follow commence roughly about an hour after that, don't they, because it's about 3.30 that she was called back?

EVANS: Something like that, yes.

MYERS: So whatever it is that lies behind desaturations later on, that is distant and distinct from the projectile vomit, isn't it?

EVANS: No, it's not.

MYERS: Because [Baby G] had settled by that point, she did not have a splinted diaphragm, nor was she in respiratory failure after Alison Ventress had left her, was she?

EVANS: That's not correct, actually. She was in a very unstable condition. If you go through all of the entries from around 2 am until about 6.30/7 in the morning, there's hardly an entry there that notes that she is stable for a significant amount of time. There are a number of entries -- if you look at what I've got on the screen here, "Dr Brearey called in" -- this is five lines down:

"On arrival sats 50%..."

Oxygen saturation at 50% is life-threatening, you won't survive on 50%:

"... despite being in 100% oxygen."

And she's having IPPV from a nurse.

So from the time of the vomit, the projectile vomit, [Baby G] never fully stabilised. Okay? That's quite important to know that. What the medical and nursing staff would not have realised, and this is not a criticism, is that all of this had compromised her far more than they anticipated, leading -- in other words, the oxygen deprivation was very marked and probably occurred for a longer period of time than they realised, which is why she's got the brain damage, et cetera, now.

So therefore she was never stable from the time of the projectile vomiting and the abdominal distension.

There was an improvement, okay? There were improvements. If you aspirate a baby's stomach, get 45 ml out, you're taking the pressure off. If she passes a stool, which happens, more pressure is reduced from the abdomen. Therefore there was an improvement, but she never, ever stabilised during the whole of this time.

MYERS: She was not in respiratory failure after the vomit, was she?

EVANS: Well, she was. I mean if she wasn't in respiratory failure they wouldn't have intubated her.

MYERS: That came -- you understand the point I'm asking you.

That came over an hour later, wasn't it?

EVANS: Well, first -- right. Perhaps you could scroll more.

She was compromised from the time of the vomiting, all right? Having worked on neonatal units for a long, long time, when things happen they occur as quickly as this, then it's -- you can't run a running commentary of what you're doing when you're trying to save a little baby's life.

So therefore she was unwell from the time of the vomiting. Oxygen... Let's have a look here. Here we go. Anyway, she was unstable from the beginning, she was never right and that's why she needed all the activity she had.

MYERS: And if the feed at 2 o'clock had caused her diaphragm to be splinted in the way you've described to us before on a number of occasions, there would not have been a period of maybe 45 minutes that followed when she was settled and able to be left by Dr Ventress, would there?

EVANS: No, I disagree, because by vomiting -- if she vomits, she gets rid of all the fluid, someone aspirates 45ml of fluid on top of that, and therefore that creates a stability of some -- you know, for a temporary period of time. In other words, the vomiting -- by vomiting she got rid of the pressure and therefore reduced the splinting of the diaphragm that was taking place. Okay?

Therefore that's what happened and that's why she was, and I use the words advisedly, relatively better after she had vomited because the splinting, which I have described, which I'm very happy with -- very satisfied with my explanation regarding the diagnosis. Once she vomits, that offers some relief to the diaphragm, allowing the diaphragm to move a little bit better than it did before. Okay? That is the mechanism. That's how it works.

MYERS: When we look at the issue of bleeding -- and we're on the right page here so we can just scroll down a little bit, please -- we can see:

"Intubated size 3 ETT, 8 centimetres at lips, bloodstained fluid noted coming up from trachea/between cords."

You have said, with some qualification, that we've seen something like this with [Baby E], haven't you?

EVANS: We did.

MYERS: This isn't even close to what we saw with [Baby E], is it?

EVANS: It's the same area, it's the upper airway, okay? It's not the upper airway, I beg your pardon, it's the back of the throat. But in terms of seriousness, no, I agree, but we do see it in a later case as well (overspeaking) come to next year.

MYERS: [Baby E] had a diagnosed gastrointestinal haemorrhage, didn't he?

EVANS: Yes.

MYERS: This is not a gastrointestinal haemorrhage, is it?

EVANS: No. I think this is an upper airway -- I think this is a back of the throat haemorrhage.

MYERS: And you suggesting a link to [Baby E], Dr Evans, is you doing something simply to support this prosecution allegation rather than properly reflect the facts that we have, isn't it?

EVANS: No, no, I'm not, I'm looking at this case in isolation, as I have done with all the other six cases we've discussed here. If it wasn't for the other six cases, my opinion regarding this case would have been exactly the same. And in fact, because I had nothing to go on when I did the initial review, I went according to the dates of birth. So this is the one I did first.

I reached this conclusion without having known about [Baby E] or any of the other cases. So this was my first case because from date of birth wise, [Baby G] was the oldest of the babies. So yes, so that is factually incorrect what you're suggesting.

MYERS: In the case of [Baby E], there was profuse active bleeding taking place, wasn't there?

EVANS: I know.

MYERS: Pardon?

EVANS: I know.

MYERS: Yes. In this instance, there is no active bleed identified or taking place, is there?

EVANS: They couldn't identify it. It depends on the degree of whatever it is that occurred.

MYERS: There's no evidence of trauma identified anywhere with the oropharynx or the trachea, even with them looking into it, is there?

EVANS: I don't know what caused the bleeding, but bleeding in the back of the throat in a baby who's stable is incredibly unusual and very, very concerning. It's very, very concerning. [Baby G] did not have a bleeding disorder and yet when they tried to -- the first time they intubated her there was blood at the back of the throat, enough blood to go through the cords into the trachea. Now, that's a worry, okay? That's a worry.

MYERS: Bloodstained fluid, it says, doesn't it?

EVANS: Well, I think Dr Ventress said she could visualise blood beyond the cords.

MYERS: And there can be natural, as in non-trauma based, reasons for bloodstained fluids, can't there, like this?

EVANS: No.

MYERS: You disagree?

EVANS: In this particular case I disagree with you.

MYERS: And a baby in [Baby G]'s condition may have had a small haemorrhage that could cause some sort of bloodstained fluid like this, couldn't she?

EVANS: Why? No reason for it.

MYERS: But it can happen, can't it?

EVANS: No, she's 100 days old, she's been stable for a long, long time. No is the answer to that.

MYERS: And you referred to, "Pulmonary haemorrhage would be a killer", I think is the expression you used.

EVANS: That's the word I used. She did not have a pulmonary haemorrhage.

MYERS: Small babies, as it happens, can have pulmonary haemorrhages of different degrees, can't they?

EVANS: She did not have a pulmonary haemorrhage. That's my opinion.

MYERS: But you don't identify anywhere, and no one does, any source of haemorrhage, do you, or they?

EVANS: Well, the back of the throat is not a very large area.

And the blood was noticed there and it is noticed beyond the cords, so it was there or thereabouts.

MYERS: We know that later -- and we can go, please, to tile 107, page 2, and scroll down, please, Mr Murphy.

Thank you.

Just above the X-ray review, a few lines above, we can see it says:

"Bloodstained fluid in oropharynx."

EVANS: Yes, back of the throat.

MYERS: This is after the re-intubation. You can see that at 06.15?

EVANS: Yes.

MYERS: And a small amount of blood after re-intubation, bloodstained fluid, however we describe it, that could be due to intubation or re-intubation on this occasion, couldn't it?

EVANS: Oh yes. If the bloodstained fluid had occurred for the first time at this time, then I wouldn't be able to say whether it was due to resuscitation or not, but that is not the case. Blood was noticed at the first resuscitation, at the first effort at intubation by Dr Ventress --

MYERS: Yes.

EVANS: -- and was noticed again for the second time. So this was -- the important thing to say here is this was not the first time that blood had been noticed in the back of the throat. That's the important thing.

MYERS: This could be due to intubation, this one?

EVANS: This could be.

MYERS: And for the first one there's no identified site of any trauma or any identified cause, is there?

EVANS: No one found anything.

MYERS: Projectile vomiting I'd like to ask you about next, Dr Evans. Babies may vomit for many reasons, mightn't they?

EVANS: Yes.

MYERS: With more or less force?

EVANS: Yes.

MYERS: Forceful vomiting in a neonate can happen, can't it?

EVANS: I don't use the word -- I'm not familiar with the term forceful vomiting. I'm not sure what it means. I'm not being awkward, it doesn't... It has no medical relevance. Sorry about that.

MYERS: A child that is unwell and it's having an effect upon their stomach, a baby like this might projectile vomit; do you agree?

EVANS: No.

MYERS: There's a division of opinion between you and Dr Ventress on that, isn't there, Dr Evans?

EVANS: I don't think so.

MYERS: You say, with respect to her evidence, you don't agree with her evidence on this.

EVANS: I don't think Dr Ventress said that babies will have projectile vomiting as a common side effect/complication of an illness. I don't think she said that.

MYERS: Well --

EVANS: Sorry, what I disagree with Dr Ventress is she said infection caused the vomiting. I disagree.

MYERS: Yes.

EVANS: The infection occurred after the collapse.

MYERS: But you heard me put to her by reference to her statement where she'd said that projectile vomiting could be caused from infection?

EVANS: If she said that, fine, but I don't agree with her. I'm not being condescending, but she was a registrar at the time, and we've heard -- I'm not going to criticise junior doctors for their opinion, okay? I'm not going to do that, I think it's unfair.

MYERS: Well, it is possible for [Baby G] to have vomited very hard, projectile vomiting, because she was unwell; do you agree or agree with that?

EVANS: No, not that degree of vomiting, no.

MYERS: Pardon?

EVANS: Sorry, and if she had vomited because she was unwell, where would the 45ml still in the stomach have come from?

MYERS: We can't actually say -- let's say that there was more than 45ml in the stomach at the time of the vomit, that for whatever reason more milk had gone in there than should have been there for that one feed. We can't say how much extra there actually was, can we?

EVANS: We can say there was a fair bit. There was quite a lot I would say.

MYERS: We don't know, do we?

EVANS: Yes, we do.

MYERS: There's no measurement of how much vomit there was, is there?

EVANS: No, but it's a lot of vomit. It's a lot of vomit, you know.

MYERS: We don't know because we don't have an image of it, do we?

EVANS: No, but it's a lot of vomit.

MYERS: You don't know how much there was, Dr Evans.

EVANS: There was quite a lot. 45ml is not much more than this glass. You've got a vomit on the chair, you've got vomit on the canopy, and you've got 45ml or more still left in the stomach. That's an awful lot of vomit.

MYERS: And if, for whatever reason, [Baby G] had not digested the milk that had been given to her at an earlier feed and milk had been fed over that, that could mean there was more than 45ml in her stomach, couldn't it?

EVANS: That is pure hypothesis. There was no milk in her stomach because the pH was 4 and milk is neutral, therefore the pH would not have been 4.

MYERS: I'm not going to go back and debate the evidence of [Nurse E] with you, Dr Evans. We've heard it.

EVANS: Anyway, I disagree with that point.

MYERS: Gastro-oesophageal reflux can cause projectile vomit, can't it?

EVANS: Yes, it can.

MYERS: And it's possible that [Baby G] had or developed gastro-oesophageal reflux, isn't it?

EVANS: The discharge letter from Arrowe Park from mid-August did not mention gastro-oesophageal reflux. What it says was, in terms of active issues, chronic lung disease and establishing feeds. She was on Gaviscon, which is used commonly, but there was -- she's got reflux afterwards.

She may well have had some reflux but the reflux would have been minor, would not have caused her any problems, and certainty would not have caused the sort of vomiting we've been discussing all day.

MYERS: Is gastro-oesophageal reflux something that can develop in a baby over time? So they're not born with it but it develops over time?

EVANS: It depends on the cause actually. It depends on the cause. So... No. I mean, it doesn't occur in... It doesn't occur in 3 hours between one feed and the next, I'll tell you that.

MYERS: But it occurs over time in a baby, doesn't it? And when we move beyond 7 September, as we're going to do, we see that [Baby G] was a baby who had a marked predisposition to vomit, didn't she?

EVANS: Once we go beyond 7 September -- and I'd still rather talk about this later -- she is so awfully compromised by the brain oxygen deprivation that she's a completely different baby, sadly. So therefore whatever applies before the 7th, you cannot apply that after the 7th. We know this from the MRI, from the scans, et cetera, that she had. Anyway. So this was the event that compromised her overall health.

MYERS: That's what you're saying, isn't it?

EVANS: No, no, there's plenty of evidence of that.

MYERS: And that's an opinion you're constructing in support of the prosecution, isn't it?

EVANS: No, it is not. We will hear, I suspect, of -- I've seen the results of... Dr Stivaros, I think, the neuroradiologist. He's mentioned how the scans before all of this were okay and the scans -- the MRI of the brain after this were not okay. So it's nothing to do with supporting the prosecution: I am giving evidence as I see it and the evidence, in my opinion, is very clear.

MYERS: Where infection is concerned, the CRP in [Baby G] was at 28 by about 2.18 on the 7th, wasn't it? We know that as a fact.

EVANS: At what time?

MYERS: By 2.18 on the 7th, her CRP reading had gone up to 28.

EVANS: 2.18 in the afternoon?

MYERS: Yes.

EVANS: Yes. Yes, 12 hours later.

MYERS: Yes. And by 22.53, so a little before five to 11 in the evening, it was up to 106?

EVANS: Yes.

MYERS: That's consistent with infection, isn't it?

EVANS: Yes.

MYERS: We know that by the time she was at Arrowe Park on the 9th, it was at 218.

EVANS: That's right, yes. I remember that.

MYERS: That could be consistent with infection developing before the vomit or after the vomit, couldn't it?

EVANS: No.

MYERS: Well, it could be, couldn't it?

EVANS: No, you're wrong.

MYERS: It takes between 24 and 48 hours for CRP to peak, doesn't it?

EVANS: It varies, actually. What you cannot do is you can't do a case-controlled study on the rate of growth or rate of development of CRP. In most cases, CRP is raised at the time the

infection presents, not in all cases but in some cases. So what you've got is -- and I don't know whom you're quoting, but the paper I read is that the CRP is always abnormal by 24 hours plus.

MYERS: Dr Ventress agreed it's 24 to 48 hours to peak.

EVANS: I haven't got a transcript, I'm not sure what -- if that's what she agreed with, but anyway, as I said, I'm not here to criticise junior doctors in training.

MYERS: She's giving her evidence now. Is she a consultant now, Dr Evans?

EVANS: Yes, well, fine, but she wasn't at the time.

MYERS: Yes, but giving her evidence now, she is, and she agrees with that, doesn't she?

EVANS: If she wants to agree with that, we'll have to have a respectful disagreement.

In the majority of babies who have an infection, the CRP is raised at the time --

MYERS: Right.

EVANS: -- of infection, okay? Not all of them, not every one of them. And as we've discussed there was nothing else -- there were no other markers of infection in [Baby G]. In other words she wasn't off her feeds, her temperature hadn't gone up, she wasn't desaturating, her oxygen requirement was with low flow. In other words, all the markers were of her getting better. You do not suddenly do this. Anyway. So therefore there were no markers of infection prior to her projectile vomiting.

MYERS: She passed a large watery stool, that was abnormal for her, didn't she, at -- shortly after the vomit?

EVANS: That's not abnormal actually. There's something called a gastrocolic reflex -- not reflux, reflex. We know this from anybody's who's looked after babies: you give them a feed and the next thing they fill their nappy.

So she's had a load of milk into her stomach, so the gastrocolic reflex kicks in, and she passes a stool.

That's okay.

MYERS: While she was at Arrowe Park Hospital, correct me if I'm wrong about this, there's no finding of or treatment for aspiration pneumonia, is there?

EVANS: When now?

MYERS: At Arrowe Park after she's admitted there having been taken there from the Countess of Chester.

EVANS: I don't think she had aspiration pneumonia, actually.

MYERS: And the mechanism that we've had described at one point was she might have aspirated something and created an infection, that's not right, is it?

EVANS: I don't know. I know she had an infection. Okay? We know that she had an infection. Nobody grew any bugs as far as I know. For the nth time, she responded to the treatment that she had. She was a very resilient little baby, actually. So she had an infection. Yes, she had an infection and it probably kicked in, you know, during the time that they were trying to save her life.

MYERS: You cannot -- to be clear about this, you say it probably kicked in then, you cannot discount the possibility it was present and kicked in at some time before the vomit? You can't discount that, can you?

EVANS: (Overspeaking) no clinical evidence whatsoever to back up that hypothesis, none whatsoever.

MYERS: I'm not going to repeat what I've put to you about the CRP, but I'm just asking, it's something that cannot be discounted, is it?

EVANS: It's not what caused her collapse.

MYERS: If there is an infection she's suffering from, will that interfere with her ability to digest her milk?

EVANS: Oh, yes, yes (inaudible).

MYERS: And if she had an infection and if she received more milk than she should have received, is that more likely to precipitate a vomit?

EVANS: Well, you've got lots of ifs, haven't you?

MYERS: Yes.

EVANS: I stick with evidence. I don't stick with ifs. So there's no evidence that she -- there's no evidence that she had infection. In fact all of the evidence is that she did not have an infection and I've got all -- you know, you only have to look at this observation chart here. All of it is absolutely as it should be, right up until she gets this projectile vomiting, no infection.

Okay?

MR MYERS: Those are the questions I want to ask, Dr Evans.

I won't debate the evidence. That will come later.

Re-examination by MR JOHNSON

MR JOHNSON: Just two things, please, Dr Evans. I'm just trying to find a reference before I ask you.

It was suggested to you in cross-examination that you were adding the suggestion that the plunger on the syringe had been used and that this was really an addition to your evidence.

EVANS: Mm.

JOHNSON: Okay? That was being suggested in the context of milk.

EVANS: Mm.

JOHNSON: Can I just go to your report of 31 May, please, at paragraph 33. It's been suggested that you were adding the concept of forcing stuff in to help the prosecution case because you saw there was a problem. Okay?

EVANS: Yes.

JOHNSON: In paragraph 33 of your report of 31 May --

MR JUSTICE GOSS: 2018.

MR JOHNSON: Yes, my Lord, thank you.

Three lines from the end of that paragraph, what do you say?

EVANS: "[Baby G] had received far more than 45ml."

That one?

JOHNSON: Yes. Read that and the next sentence, please?

EVANS: "(inaudible) NGT tube before she vomited she may have also received a bolus of air from the feeding syringe used for feeding."

JOHNSON: How can you get a bolus of air into a child without using the plunger?

EVANS: You can't.

JOHNSON: Air won't go down under its own --

EVANS: No, air goes up. Yes. So if the air had gone down, it needed a plunger for it to be pushed down. So yes.

JOHNSON: Well, I'm only mentioning this because it was suggested that this isn't something that features in your report, all right?

EVANS: Yes, fine.

JOHNSON: You were asked about gastro-oesophageal reflux.

EVANS: Yes.

JOHNSON: At one stage, your response was it doesn't develop between two three-hourly feeds.

EVANS: Correct.

JOHNSON: Because the suggestion is, apparently, that [Baby G] had some, if not all, of her previous feed from 11 o'clock in her stomach when she was given the feed at 2 o'clock.

EVANS: Mm.

JOHNSON: So let's deal with a couple of issues. If [Baby G]'s stomach had been full before she was fed at 2 o'clock, and [Nurse E] had aspirated something to check for a pH, what would [Nurse E] have got back?

EVANS: She'd have got back some milk.

JOHNSON: Would it have been digested or undigested?

EVANS: It would have still have looked like milk.

JOHNSON: And would the pH of that be 4?

EVANS: It might be slightly acidic. A pH of 7 is neutral.

Therefore a pH of 6 is slightly acidic, pH 5 is more acidic, pH 4 even more acidic. So you wouldn't have that pattern of acidity if -- because the milk would have partly neutralised the acid. And anyway, if she'd aspirated some milk, you know, it would look like milk.

JOHNSON: Gastro-oesophageal reflux, how does that start to develop in a child of 100 days?

EVANS: It doesn't start overnight. If she had reflux -- you know, she was on half bottle feeds, if she gastro-oesophageal reflux, a nurse would have noticed a bit of milk coming up between feeds, perhaps, a bit of milk coming up between feeds, that sort of thing.

JOHNSON: Let's just look at the feeding chart, if we may, which we have behind divider 7, I think.

MR JUSTICE GOSS: It's the second to last document in that section, J7012.

MR JOHNSON: There we have two days' worth of feeding at three-hourly intervals as you have told us.

We have a "vomit/asp" column for 2 days. Reading down from the top, we have -- well, what does it say, something acid?

"Positive acid. Positive acid. Positive acid."

EVANS: Yes.

JOHNSON: Then pH 4 for the final NG tube. Is that indicative of -- is that feeding chart indicative of a child with gastro-oesophageal reflux?

EVANS: No, not really. Anyway, you can't diagnose reflux on pH values. The other point by the way --

JOHNSON: What about the lack of vomiting?

EVANS: She's not vomiting.

JOHNSON: What does that tell us about whether --

EVANS: If she's not vomiting she hasn't got reflux, so how are you going to diagnose it? The other point -- sorry, go on.

JOHNSON: Sorry, does it go from nothing for 2 days to projectile vomiting in 3 hours?

EVANS: It just doesn't. That does not happen, okay? That does not happen. Nothing -- this projectile vomit has nothing to do with gastro-oesophageal reflux, okay?

MR JOHNSON: Thank you.

Does your Lordship have any questions?

Questions from THE JUDGE

MR JUSTICE GOSS: The other thing that you were wanting to say. The other thing. You kept saying, "The other thing", and then Mr Johnson would cut you off.

EVANS: Oh yes. Just for completion, really. If the milk goes in and is digested, you have a bowel action, and it comes out the other end. She had a number of bowel actions over these last 2 days, which is what you'd expect. So it goes in one end, is digested, the waste stuff comes out as a bowel action, and she had bowel actions. The last one was at 23.00 hours, so just 3 hours -- so all of that is indicative of normal gastrointestinal function. That's all.

MR JOHNSON: Thank you. I'm sorry I cut you off.

MR JUSTICE GOSS: Is it possible or not, I don't know, just to see this pattern of feeds and the comments in relation to the feeds, like demand fed, fed well, this sort of thing, as to whether there was any sort of difficulty, apparent difficulty, of [Baby G] in digesting these 45ml feeds?

EVANS: No, this is about as normal as you get in a baby needing NG feeds. If I just looked at this in isolation, I'd say, this is great, this is as good as it gets, to be fair. There are no red flags here, there are no concerning issues here. This is very satisfactory.

MR JUSTICE GOSS: Right.

EVANS: It's as good as that.

MR JOHNSON: Thank you.

MR JUSTICE GOSS: Thank you, Dr Evans. That completes your evidence on this aspect.

MR JOHNSON: I'm going to call Dr Bohin next, my Lord. It's a question of whether that's now or first thing.

MR JUSTICE GOSS: Well, it's 4 o'clock. She's obviously going to be a lot longer than 15 minutes or so.

MR JOHNSON: Yes, because there's -- so the jury knows what's coming, one of the things Dr Bohin has gone into some detail on is whether or not there was any history of vomiting at Arrowe Park before [Baby G] got to the Countess.

MR JUSTICE GOSS: All right. Is there a convenient 15 minutes you could do or not?

MR JOHNSON: I'm happy to start.

MR JUSTICE GOSS: We might as well use the time because we never know what the future holds of not being able to proceed and we can proceed for 15 minutes, so let's get on with it.

MR JOHNSON: Yes. Dr Bohin, please.

DR SANDIE BOHIN (recalled)

Examination-in-chief by MR JOHNSON

MR JOHNSON: Welcome back. Would you just identify yourself for the sake of the record, please?

BOHIN: Yes. I'm Dr Sandie Bohin.

JOHNSON: Thank you. Have you written several reports in the case of [Baby G]?

BOHIN: Yes.

JOHNSON: Just dealing with them, was your first report 28 March 2019?

BOHIN: Yes.

JOHNSON: Your second, 31 January 2022?

BOHIN: I've got a report of 15/10/21.

JOHNSON: Sorry, that's my mistake. Perhaps it's easier if you tell us the dates of your reports.

BOHIN: 15/10/21.

JOHNSON: Thank you.

BOHIN: 31/01/22.

JOHNSON: Yes.

BOHIN: 07/04/22.

JOHNSON: Yes.

BOHIN: 23/11/22.

JOHNSON: Thank you.

Can I start, please, with your report of 28 March 2019?

BOHIN: Yes.

JOHNSON: So far as your initial involvement was concerned, did it follow the pattern that was established in the other cases about which the jury have heard your evidence?

BOHIN: Yes, it did.

JOHNSON: So you were sent material relating to [Baby G], including her medical records, and also one or more of the reports that by that stage had been written by Dr Evans?

BOHIN: Yes, that's correct.

JOHNSON: Thank you. I think, you having set out the terms of engagement at paragraph 6 of the report or section 6, you set out the relevant chronology of [Baby G]'s life?

BOHIN: Yes, that's correct.

JOHNSON: Her birth on 31 May 2015?

BOHIN: That's correct.

JOHNSON: The fact that she was extubated on 6 July 2015 at 38 days of age?

BOHIN: That's correct.

JOHNSON: She was initially put on to BiPAP and then on to CPAP?

BOHIN: That's correct.

JOHNSON: She remained -- well, whilst at Arrowe Park, brain scans that were conducted of [Baby G] were normal?

BOHIN: Yes, they were.

JOHNSON: And there were many of those: 1 to 5 June, 12, 14, 19, 30 June, 10 and 31 July, and 3 August?

BOHIN: That's correct.

JOHNSON: And all those were reported by the radiologists as being normal?

BOHIN: Yes.

JOHNSON: With the one qualification of the mild ventricular dilation in the later scans?

BOHIN: That's correct.

JOHNSON: But your opinion, which I assume is subject to that of a radiologist, is that that's not significant but just required monitoring?

BOHIN: It is not significant as an isolated finding, but yes, would require monitoring, but any baby born at that gestation would have been on a programme of having quite a lot of ultrasound scans in any case to monitor that.

JOHNSON: Thank you. You then turn to the transfer of [Baby G] to the Countess of Chester on 13 August.

BOHIN: Yes.

JOHNSON: And then on to consider how she had behaved and presented herself at the Countess of Chester in the ensuing days?

BOHIN: Yes.

JOHNSON: So taking that up, please, at paragraph 6.7, did you record the fact that [Baby G] was receiving enteral feeds every 3 hours via bottle or NGT?

BOHIN: That's correct.

JOHNSON: That she was giving no cause for concern?

BOHIN: That's correct.

JOHNSON: That the observation charts for her between the 2nd and 6 September were unremarkable?

BOHIN: That's correct.

JOHNSON: Her temperature was stable, as was her heart rate and her respiratory rate?

BOHIN: That's right.

JOHNSON: She had at that stage no desaturations or apnoeas?

BOHIN: That's correct.

JOHNSON: And a blood gas taken on 5 September was normal?

BOHIN: That's correct.

JOHNSON: The feeding charts which the jury have in the paper bundles behind divider 7, which we've just been looking at with Dr Evans, showed that on the 5th and the 6th, [Baby G] was being fed every 3 hours? It should be divider 7, page 7012. It's the penultimate page.

You've got the wrong one. I do it all the time. I've written "1" and "2" on the back of mine.

BOHIN: Yes.

JOHNSON: Are those the charts to which you referred in your report?

BOHIN: Yes, that's correct.

JOHNSON: Did you also record the fact that [Baby G] had no vomits and no significant aspirates from her NGT --

BOHIN: Yes, that's correct.

JOHNSON: -- in those 2 days?

BOHIN: That's correct.

JOHNSON: Did you also record the fact that, from the available material, her bowels opened four times on the 5th and once on 6 September?

BOHIN: That's correct.

JOHNSON: And her weight was increasing?

BOHIN: Yes.

JOHNSON: Your paragraph 6.10, looking at the bottom of that page, 7012, did you record that at 23.00 hours on 6 September [Baby G] took a bottle of 45ml of expressed breast milk?

BOHIN: That's correct.

JOHNSON: Over the page on the chart at 7013, at 02.00 hours, she took a further 45ml of feed at 2 o'clock in the morning?

BOHIN: She was given a nasogastric tube feed at 2 o'clock in the morning, yes.

JOHNSON: Thank you. And that the NGT was recorded as having been aspirated prior to that feed?

BOHIN: With a pH of 4.

JOHNSON: Yes. Then you moved on to the large projectile vomit and further vomits plus plus recorded in the medical notes and in Lucy Letby's nursing note?

BOHIN: Yes, that's correct.

JOHNSON: You then set out the treatment that she received, that [Baby G] received, at the hands of Dr Ventress?

BOHIN: That's correct.

JOHNSON: The fact that 45ml of milk were aspirated from the NGT altogether with a large volume of air?

BOHIN: Yes, that's correct.

JOHNSON: And that various treatments were given to [Baby G] that morning at various times following further desaturations?

BOHIN: That's correct.

JOHNSON: At your paragraph 6.18, did you record the fact that [Baby G] was then transferred to Arrowe Park on 8 September?

BOHIN: Yes.

JOHNSON: Your paragraph 6.19, that she returned to Chester on 16 September?

BOHIN: Yes.

JOHNSON: And that thereafter there were incidents which the jury have yet to hear about?

BOHIN: That's correct.

JOHNSON: Thank you. So far as the later incidents are concerned, I'm not going to ask you about those at all at this stage. I'm just going to concentrate on what happened in the early hours of 7 September.

Did you, in your opinion and observations of your report, conclude that [Baby G] was very vulnerable, born at the margins of viability?

BOHIN: Yes.

JOHNSON: And that she had a very stormy early neonatal course, which required a huge amount of neonatal intensive care?

BOHIN: Yes, that's correct.

JOHNSON: Having looked at the material from Chester in its entirety, which of course includes the material we've just referred to, what conclusions did you draw as to her state of health up to the point at which she collapsed some time after 2 am on 7 September?

BOHIN: She was very stable at that time. She had -- her respiratory requirements had changed from CPAP to high flow and then to a very small amount of low-flow oxygen.

She did have chronic lung disease, which meant that her lungs were abnormal, but she was managing well on a small amount of oxygen. Her respiratory rate was stable, her oxygen saturation was stable. She wasn't having any desaturations. So from the respiratory point of view, all was well. Her heart rate was stable, her temperature was stable.

On top of that she had gone from two-hourly feeds to three-hourly feeds over the course of the time at the Countess of Chester and was tolerating those. She'd started taking some bottles and therefore things were progressing really very well and as you'd expect them to be for a term baby.

JOHNSON: Thank you. I'm looking at your paragraph 7.3, but if the jury want to remind themselves of the observation charts that are at the beginning of divider 7. What conclusions did you draw from what you could see on the charts as to [Baby G]'s vital signs before the first of the collapses?

BOHIN: They were all completely normal.

JOHNSON: So far as the report of projectile vomiting is concerned and the photograph marked by and the description given by Ailsa Simpson is concerned, what conclusions or views did you reach?

BOHIN: The whole episode was concerning for me. Ailsa Simpson said that they heard projectile vomiting so I'm not quite sure what they heard because when babies vomit it's usually silent,

but maybe they heard the vomit hitting the floor. In my experience, even working on a neonatal surgical unit, I haven't seen babies of 2 kilograms projectile vomiting. So for me that was something that was quite extraordinary.

JOHNSON: Putting that into the context of the distance of the vomit, together with the fact that 45ml of milk was aspirated together with air plus plus, what conclusion did you reach?

BOHIN: Well, there must be a huge volume of milk coming from somewhere because the baby's generated a huge amount of force in order to projectile vomit. It wasn't only on the cot but over the side of what is quite a deep side to the cot that we were shown that she was being nursed in at the time. So a baby lying flat on their back has to vomit over the side of the cot, which gets to the floor and then over the side again to get on to the chair. And in order to move that distance, a considerable force has to be generated within the abdomen. We don't know the volume of that vomit. But it was clearly a lot if it's landed in three places and on top of that the nurses write, "Continued to vomit ++", whatever that means, and there's 45ml of milk aspirated from the stomach. So altogether there must have been at some point much more than 45ml of milk within the stomach.

JOHNSON: Yes. In your view, is there a credible "innocent"

explanation for there being more than 45ml of milk in [Baby G]'s stomach at the time that she vomited?

BOHIN: No, because I think her stomach was empty prior to that 2 o'clock feed because the pH was 4. If she'd had a lot of milk in her stomach (a) the nurse who aspirated it to test the pH would have noted that -- she may not have wanted to aspirate the whole lot, but she would have noted that there was milk in the stomach, and she hasn't noted that, but what she has noted is that the pH is 4.

If there was milk in the stomach the pH would not have been 4, that's very acidic. The pH would have buffered -- the milk would have buffered the acid in the stomach so would have neutralised it to some extent and you wouldn't have got a pH of 4.

So there was additional milk. The additional milk that is vomited had to have come from somewhere.

I think her stomach was empty and I think the only plausible explanation for me was that she was given an excessive amount of milk, and possibly air, down the nasogastric tube, which distended her stomach and caused her to then vomit in the way she did.

JOHNSON: In this context we have heard, and you have been listening in, watching in via the video facility, we've heard about [Baby G]'s CRP level being normal just before the incident, getting to the margins of normality at 12, or whatever it was, a bit later, and then increasing to a figure of over 100 by the late evening of the same day.

BOHIN: Yes.

JOHNSON: In your view, is what happened to [Baby G] plausibly explained by an infection?

BOHIN: No. I think it's clear that [Baby G] had an infection, but I don't think the projectile vomit heralded the start of the infection. That isn't the way that infections present in neonates of this age and size. They usually provide the carers with subtle markers that all is not well and she showed none of those things. Starting with a huge projectile vomit and then continuing to deteriorate in the way she did is not the way that infection presents.

JOHNSON: Thank you. There are other issues that I want to ask you about. It may be that that's a --

MR JUSTICE GOSS: Unless it's something that can be dealt with in a few minutes.

MR JOHNSON: I can deal with the issue of taking on air.

MR JUSTICE GOSS: Yes, I think so. When you get to Arrowe Park Hospital and looking at those records, which we haven't looked at yet --

MR JOHNSON: Of course.

I'm moving on to your report, Dr Bohin, it's a report that I don't have a date for, I'm afraid.

I think it's probably your second report.

BOHIN: 15/10/21, where I'm asked questions?

JOHNSON: Yes, that's the one.

BOHIN: Yes.

JOHNSON: It's your paragraph 6 of that report. You were approached by the police and you were told that in her interview Lucy Letby had said that babies can take on a lot of -- I think this was in the context of the air that was drawn out after the vomit. "Aspirated", I should use that expression. "Air ++"

aspirated after the vomit. Lucy Letby had been asked about this and had said that babies can take on a lot of air when vomiting and you were asked to express a view as to whether or not that was correct or not. Could you assist the jury with that issue, please?

BOHIN: That's not correct. What I have written is babies do not take in air when vomiting and I have written that I have no idea if there are literature reports on this.

But there aren't. If you're vomiting, things are coming out, they're not going in.

MR JOHNSON: Tomorrow I'm going to ask you about your research of these medical notes from Arrowe Park, so perhaps I can leave that until then.

MR JUSTICE GOSS: Yes, certainly. Good.

Thank you very much, Dr Bohin. 10.30 tomorrow morning to continue.

BOHIN: Thank you very much.

(The witness withdrew)

MR JUSTICE GOSS: Right, ladies and gentlemen. 10.30 tomorrow morning then, please. I'll remind you, it's the start of another week, we haven't seen each other for a few days now. Please remember your responsibilities as jurors not to communicate with anyone in any way about anything to do with this case or conduct any research into anything or anyone to do with this case. Thank you very much. 10.30 tomorrow morning.

(In the absence of the jury)

MR JUSTICE GOSS: I've received a note. The defendant has gone now. I'll simply hand it to counsel for you to look at and we will address it tomorrow morning.

MR JOHNSON: I don't think there's an answer to that one.

I think we have tried to get the answer.

MR JUSTICE GOSS: Well, perhaps -- I'll leave it to you as to what you want to do. As an issue it can be dealt with, even if a direct answer cannot be given, or a direct answer can be given but it may not be a mathematical answer. That's what I'm striving to say.

But I'll leave it with you both.

MR JOHNSON: You'll see one of the questions we asked was: scaling it up to an adult, can you give us the corresponding amount? Which we thought was the most graphic way of getting an answer, in effect, to that and that you can't.

MR MYERS: If the answer is that we can't then that is the answer, I suppose, and it's better than any attempt at guessing something that isn't clear.

MR JUSTICE GOSS: Yes, certainly one cannot do that. But I think the issue needs to be addressed even if the answer is not wholly satisfactory from the questioner's point of view. All right, good. Thank you very much.

10.30 tomorrow morning.

(4.21 pm)

(The court adjourned until 10.30 am on Tuesday, 13 December 2022)