Monday, 5 November 2012

(9.30 am)

(Delay in proceedings)

(9.40 am)

PROFESSOR BRIAN NEVILLE (continued)

Questions from MS ANYADIKE-DANES (continued)

THE CHAIRMAN: Good morning, professor. Ms Anyadike-Danes?

MS ANYADIKE-DANES: Good morning, professor.

Professor, there are some points I have been asked to go back and deal with and ask you to assist with, some of which may be slightly new; others may be to clarify things that have already been said.

A series deals with differential diagnoses. If we just run through the differential diagnoses or, at least, the working diagnoses that the medical notes and records disclose. The first is the GP, which isn't really a diagnosis, but it's a query of whether Claire had had a further fit or that there was some sort of underlying viral issue, and the reference for that is 090-011-013, not to be pulled up.

Dr O'Hare, at 8 o'clock the previous evening, thought the problem was a viral illness. She also considered encephalitis, but she struck that out, and the reference for that is 090-022-052, and I'm going to come back to Dr O'Hare and her evidence in a minute.

Dr Sands, at the ward round at 11 o'clock on the Tuesday morning, he thought non-fitting status, and apparently also at that time thought encephalitis, although it wasn't recorded then. And subsequently thought and added encephalopathy. The reference for that is 090-022-053.

Dr Webb, when he saw Claire, thought non-fitting status epilepticus. The reference for that is 090-022-055.

So the first question I'd like to ask you is: what comment can you make about those diagnoses at each of those three times? The first is on admission at 8 o'clock on the Monday evening. The second is at the ward round at 11 o'clock, or thereabouts, on the Tuesday morning. The third is throughout the rest of the day.

MR SEPHTON: My learned friend should make clear that Dr Webb was revising his opinion by 5 o'clock in the evening, so to suggest that his view was non-convulsive status epilepticus throughout the day is not fair.

MS ANYADIKE-DANES: Sorry, I'm not sure that I had indicated Dr Webb thought that throughout the day; I said when he had seen her. We can pull it up, 090-022-055.

MR SEPHTON: If you look at the transcript, it says:

"The second is ward round at around 11 o'clock. The third is throughout the rest of the day."

MS ANYADIKE-DANES: That's a question I've asked Professor Neville, but let's take it from the medical notes and records.

THE CHAIRMAN: It's a multiple part question. Are we not better doing it at the different times instead of asking Professor Neville for a multiple-part answer to a multiple-part question?

MS ANYADIKE-DANES: Yes, I am asking for a multiple-part answer to a multiple-part question because those are the differential diagnoses, the range of them. And in relation to Dr Webb, I have just pulled up the medical notes and records where you see:

"22 October, seen by Dr Webb [this is Dr Stevenson's note]. Still in status."

And the only status reference that we had was Dr Sands' note at the ward round, 090-022-053, which is, if you see it there, "non-fitting status". So I had maybe wrongly interpreted Dr Webb to be agreeing or at least confirming that Claire, at that time, was still in status, meaning non-fitting status epilepticus.

But if I can ask you this then: if we start with when she was admitted at 8 o'clock, Dr O'Hare's view at that time is a viral illness having considered and apparently rejected encephalitis; can you express a view?

A. Yes, I think a viral infection is very likely, though of course it doesn't explain all of the problems. But nevertheless, it's quite likely. I think encephalitis was mentioned in the same breath, wasn't it?
Q. It was, and then she has crossed that out in her note, and one sees that at 090-022-052.
A. Yes. Well, it remains a possibility for what had occurred in this situation. It just is a little bit less likely because the child had had previous illnesses before, but it doesn't actually preclude it.
Q. Do you think therefore she perhaps should have retained it?
A. Yes.
Q. Thank you. Then the next time is at the ward round which happens about 11 o'clock, and that is Dr Sands. If we pull that up at 090-022-053, he has "non-fitting status", that's as recorded by Dr Stevenson. His evidence was he had also discussed during that ward round encephalitis, but for one reason or another it was not recorded. But he subsequently, after a discussion with Dr Webb, added "encephalopathy", and while he was doing it added the "encephalitis" that he says he had previously discussed at the ward round. So those are the three there. We're not entirely sure when the latter two, "encephalitis/encephalopathy", were added by

Dr Sands. It is his hand, but in any event that's what he considered to be the differential diagnoses. Can you comment on that, at that time, which is 11 o'clock, on the information he would have had or could have had?

A. Non-fitting status would be possible, but I think a bit unlikely in the context of having had no seizures for that length of time. And encephalitis remains a perfectly reasonable possibility. There's nothing different about encephalopathy, it's just another affection of the brain, it doesn't add any further diagnosis.

Q. So at this stage what else, so far as you're concerned, might have been included?

A. Oh, I think a rise in intracranial pressure. There were other things that could be excluded, I think, by CT scans, which were not.

Q. Yes. And those things that could be excluded, are you indicating that perhaps they should have been included so that tests could be carried out to see whether they --

A. Yes. Either that night or probably the following morning.

Q. So we're clear, the following morning would be --

A. The 22nd.

Q. This ward round is on the 22nd.

A. So it's the 22nd, that morning.
Q. Yes. Since we're clear, you have said that the viral illness that Dr O'Hare at 8 o'clock on the evening of the 21st had included was reasonable enough, and it would have been appropriate for her to have retained her thought about encephalitis. Given what you have just said about what might have been included in this note after the ward round, could anything else in your view have reasonably been included by Dr O'Hare at that time, given the information that she had available to her?
A. Oh, I think hyponatraemia wasn't in that group, was it? So I think that would be another reasonable assumption, yes.
Q. Thank you. Then Dr Webb, he sees Claire at 2 o'clock, so later on that day of the 22nd. It's not entirely clear if he saw her at any time after that -- I mean, before his note at 5 o'clock -- but in any event, we do have his notes for 2 o'clock and 5 o'clock. His view appears to have been continuation of the non-fitting status. Is there anything else that you think, at that stage, he could reasonably have been considering as a differential diagnosis?
A. Well, in clarifying that diagnosis, obviously an EEG is required, really.

Q. But given that that had not happened?
A. Then I think that the potential swelling of the brain, cerebral oedema, remained a possibility which hadn't been excluded, and as we now know, no further tests were done until much later.
Q. Yes. But if we stick in their time, if I can put it that way, you mentioned hyponatraemia, I think, earlier in relation to Dr O'Hare.
A. Mm.
Q. At 8 o'clock, she wouldn't have received any serum sodium result at all.
A. No.
Q. That didn't happen, so far as she's concerned, until around about midnight, I think.
A. No, but the child had been vomiting --
Q. Yes.
A. -- and had lost speech and so was significantly sick.
Q. Yes.
A. So I think there's a reason for going along that line as well as a number of other lines.
Q. Yes. Do you think that anybody after her should have retained the possibility of hyponatraemia?
A. Yes. I think it should have remained with them and they obviously seem to have thought that they might have done the further test the following morning, but didn't.

Q. Professor Young, who is a consultant biochemist and was asked by the medical director in 2004 to look at Claire, to review Claire's medical notes and records. It was he who had a concern that hyponatraemia may have played a part in Claire's death. He gave evidence at the inquest and, in the course of that, he said that Claire had the potential for electrolyte imbalance. That's to be found at 091-010-059.

When you were just answering me then and saying that you thought that they might have started off with hyponatraemia as a possibility and, indeed, retained that, do you think that Claire had a potential for electrolyte imbalance?

A. Yes. She had a neurological illness and became acutely unwell, and thus she was in that group who might do that.

Q. And if that's the case, how does that link in with your answer that they should have thought of hyponatraemia and retained that as a possibility? Are those two things connected, the fact that she might have had a potential for electrolyte imbalance?

A. Yes, that's the same thing.

Q. Thank you. Just for completeness -- although it wasn't a working diagnosis; it's one of the things I've been asked if you could comment on -- in the autopsy report,

the pathologists have concluded -- and we can pull that up, 090-003-005. You see there, it says under "Comment", if we leave aside the neuronal migrational defect and see:

"Low grade sub-acute meningoencephalitis."

Leaving aside that this is what the pathologists say they have found on examination -- and we have experts to consider that point -- from your point of view, was Claire's presentation consistent with that?

A. Her primary presentation was with cerebral oedema.

Q. Yes.

A. That was attributed to hyponatraemia. I think there's some doubt about the low grade, sub-acute meningoencephalitis.

Q. I understand. Then if we move on through the different views that have been expressed. Dr Dewi Evans, who's a consultant paediatrician -- and he was an expert for the police, the PSNI -- he consulted with an intensivist consultant paediatrician, Dr Dawn Edwards, and she expressed certain views as to Claire's presentation. I wonder if you could comment on that. It's to be found at 097-001-001.

It's a very short piece and this is a record of a communication between, as I understand it, Dr Dewi Evans and the PSNI. It is, as it states, that

he has consulted with her and she confirmed that, and these are her three views. I wonder if you can comment on that. This relates to Claire's presentation as she was admitted, if I can put it that way. And she says:

"Postictal abnormalities disappear at least by 3 to 4 hours."

Would you accept that?

A. I think you're getting really quite mixed messages here. We don't know this child was postictal and the notion was, I think, that she was in continuous status.

Q. Yes.

A. So I'm not sure what "postictal abnormalities" means. Certainly their disappearance by three to four hours, if she actually has those -- it's usually much quicker than that as well. So I'd be -- I think what she may be referring to is the sluggish pupil reactions, which occurred, and which continued to be sluggish pupil reactions. That, I think, is more suggestive of a rise in pressure than it is of something which comes and goes. But we don't know that anything was coming and going.

Q. If we pause there. I think one of the concerns, or the queries, was that she had had some kind of seizure, and what was being seen was, if I can put it in layman's term, the after effects of that. And when they took her

to the Royal, that's actually what might have been being seen or considered to be the case. So I think the issue is: is that consistent with how she continued to present? And my understanding of what this note is recording is that Dr Edwards is saying, no, she doesn't think it is consistent because if it was something like that, then she would have expected the effect of that to have disappeared at least by three to four hours.

I think that's the first point. I think your answer was: well, if it was something like that, you actually would have thought it would have disappeared even earlier than that.

A. Yes, because it was quite a short fit, if it was.

Q. Then to follow on from that, it's her second point, which is she would have expected it to have disappeared in that period and that problems remained at 0900 hours, so that's the following morning, if I can put it that way. She considered that to be an indication of seriousness, and if there were problems remaining like that, she would be worried if that happened even just after an hour.

A. Yes.

Q. Can you comment on her, so far as you can, observations at points 2 and 3?

A. No, I would agree with both of those, those points.

Q. Thank you.
A. And it accords with the assessment of the patient that they were looking at. She was seriously unwell.
Q. Yes. When you were giving evidence for us on Thursday, you had discussed a developing cerebral oedema, and I think it was my term, the tipping point, but in any event it was in the context of not waiting before you do a CT scan because you don't necessarily know how much time you've got. In fact, a CT scan will be the very thing to tell you how much further scope there is for swelling of the brain.
A. Yes.
Q. And I think the reference to that in the transcript is 1 November, page 106, and I think it starts at line 3. That's where I ask you about the tipping point:

"Is that because there is a certain space between the brain and the skull?"

And you say:

"Yes, that's right."

I ask you how you would know that you were getting to the end of the amount of available space for swelling and you say by a CT scan.

I wonder if you could help us by reference to a schematic that we had when we referred to an earlier case, which is Adam Strain, and it's to be found at

300-088-186. If you see there, it's just a schematic, but in the first one, it's setting out the normal intracranial contents and you see the space with the CSF and where the skull is and the brain. In the second one, you see the brain bulging up against the skull, pushing down through the foramen magnum. When you talked about that, that it can happen quite quickly, the traumatic effects of it, can you explain that in any way in relation to either of these schematics?

A. Yes, I think for these -- these show the effect of figure 1(a) being normal and figure (b) with the skull being expanded and ... What you can't quite get the picture of is how fast it will rise --

Q. Yes.

A. -- but it does rise very quickly at the end.

Q. Does that differ very much from child to child?

A. No, I don't think so.

Q. And as it is getting close towards the maximum ability to expand without damage being done, what are the signs of that? So before it actually gets to the position of figure 1(b), what are the evident signs of that happening?

A. The signs fundamentally are reduction in conscious level. There may well be attacks, and those attacks may be of extension of the neck, sometimes with gritting of

the teeth and sometimes with eyes rolling upwards.

Q. Would the presence of papilloedema be an indication of that?

A. Papilloedema is very late in this process, so that you would expect to be spotting this before papilloedema had appeared, and if you had papilloedema you'd know you'd probably had it, you know, you were beyond the point of no return.

Q. The reason I ask you that is because of part of Dr Webb's note when he examines Claire at 2 o'clock that afternoon on the Tuesday. We see it at 090-022-054. If you see in the first part of it, he talks about how the optic discs are pale, and then he records:

"No papilloedema."

Which is from where the pointer is there. From what I understand you to be saying, that doesn't necessarily exclude a developing cerebral oedema.

A. No, far from it. It's what you would expect.

Q. At that stage?

A. Yes.

Q. Then you went on to discussed raised intracranial pressure and in relation to its effect on the PCO2s, and I wonder if you could help us with that. We see that in the transcript at pages 181 and 183. If you look, starting at line 11, when you had made the note at 15:

"It likely to have reduced her conscious level and therefore [this is in relation to the 12 milligrams of midazolam] reduced her breathing and increased her PCO2s."

And then I ask you at 183 at line 7 about the relationship between that increase and her intracranial pressure. Then you talk about it rising potentially to 70 to 80 micromoles and hyperventilation is something that can be applied to bring it down.

We can see what it was at intensive care. That's to be seen at 090-057-206. It's the set right down at the bottom, so by "suction", there we are. Then if you see the second line, "PCO2s". If that can be highlighted, just straight across the line. That gives the recordings. Now, apart from the one right at the end, which is at 18.15, I believe, it's not anywhere near the level that you had talked about. Is there any reason why that would be the case?

A. It moves around a bit, doesn't it?

Q. It does.

A. But in general, it's low and ...

Q. In fact, if you see by 6.22 in the morning, it seems to be either 79.2 or 74.2. It's difficult to see.

A. Yes.

Q. I'm wondering, in the light of what you had said,

whether you can help explain that. There is a note that Dr McKaigue makes in Claire's medical notes and records. One can see that at 090-022-059.

A. These are all intensive care, aren't they?

Q. Exactly.

A. So we don't really know what happened --

Q. That's why I'm pointing this out to you. If we look halfway down it, says, "In PICU, hyperventilated". And then if we go down to the bottom of that section, it says, "PCO2, 79.2". And that's the figure that we saw right at the end of that series.

But what I'm really asking you is: can one infer anything about the likely levels of her intracranial pressure in the afternoon or the evening of the 22nd by looking at that series from intensive care?

A. I don't think you can, really. I think it obviously was likely to fluctuate, but I can't predict that.

Q. No. Well, if, for example, they had done the very thing that you had indicated to the chairman that they could have done to try and assist, which is ventilated her, and I think you had said that if they were going to do that, they would be doing that in intensive care because that's not something that would be done on the ward. If that had happened, is that something that could have affected her figure so one can't necessarily

deduce anything from those figures about --

A. Yes, if you hyperventilate, then of course you've taken the CO2 down, and that's ...

Q. That's what it seems to suggest if you look at that note that they had done, although when they started that isn't entirely clear. Notwithstanding that, if it ends up at 79.2 in the evening of the Wednesday, is that simply because all measures at that stage had failed?

A. I suppose so. I'm just not completely sure why it should have suddenly risen.

Q. We can bring it up again. 090-057-206. If we highlight the "suction" section right at the bottom and if you could put an indicating line against the PCO2 right across the series. I should say that at 18.25, it's about the time they did the second brainstem test.

A. Right. So they may well have been letting the PCO2 rise in order to test her response.

Q. Well, it's not clear. If one looks at where it is earlier in that series, you can see it's 53, 42, and then it goes up to the 74. But it sort of moves around a little bit, and all I'm trying to see -- because I think that some have asked about it -- is whether anything reliable can be taken from this series once she gets into intensive care and is being treated to assist with what her intracranial pressures might have been

earlier? That's the point of putting it to you.

A. It looks as though they have hyperventilated her, that although that was successful, it's too late.

Q. It seems that Dr Steen has also mentioned towards the end, which is consistent with that 70 figure -- she refers to it at 18.25 as being 70. And the reference for that is 090-022-061. But I think from this, it's clear that it was high right at the end.

A. Yes.

Q. The point that I was putting to you, and I think you have answered it, is that you can't necessarily deduce anything about her earlier pressures from looking at this series.

A. No.

Q. And you are still of the view that raised intracranial pressure is something they should have had in mind earlier.

A. Yes.

Q. Thank you. Sorry, if you just give me a moment, I think something has come up. If you're going to perform brainstem tests, do you stop hyperventilation?

A. You stop hyperventilation and one part of the test is to allow the CO2 to rise.

Q. If that's the case, if there's a 6.22, the first brainstem test was done at 6 o'clock in the morning, and

the second was done at about 6.25/6.30 in the evening. And on that basis, would that account for those higher scores at those times so far as you can tell?

A. They could have done.

Q. Thank you. Then I wanted to ask you something in more detail about the medications that were prescribed and administered to Claire. The last time you were giving evidence, an issue arose over the onset of action of the various medications and how long the effect would last. Dr Aronson, as I've mentioned, has been retained by the inquiry to assist with the medications and their likely effect, and he has provided a report and we are seeking some further information from him.

In his report, he does deal with three of the anticonvulsants in terms of when the onset of action would be for diazepam, and one finds that at 237-002-008. He says the onset of action would be -- you can see it there. Just under (b):

"I would expect the onset of action of diazepam to occur within about 10 to 30 minutes."

And then under (c) he says:

"The effect of a single dose would last as long as 1 to 2 days."

So that's diazepam.

In relation to IV phenytoin, he deals with that at

237-002-009, and he says that the phenytoin, under (f):

"The onset of action for phenytoin, for an intravenous dose, would be 30 to 60 minutes. The effect of that would last for up to 24 hours."

As it happens, Claire got two amounts of phenytoin, she had the loading dose and she had the infusion.

Then in relation to midazolam, he deals with that at 237-002-013. He says that the midazolam -- the onset of action, under (v), is about two minutes after an intravenous injection. He doesn't deal with how long it stays in the system because that wasn't an issue because, in fact, the midazolam continued by infusion up until the time of her collapse. So he wasn't particularly asked that question, but we are seeking some further information from him.

The reason for saying that is there was some concern that that information wasn't before us when you were dealing with the medications. So that's how long Dr Aronson thinks. What I would like to ask you, though, is that the rate of the phenytoin infusion, that was commenced at 2300 hours, was prescribed, and we can see that at 090-022-054. It's the second:

"Phenytoin 2.5. 12 hours equals ..."

And then there's a calculation. So the rate is prescribed. If you look above it, which is the loading

dose, there's no prescription for the rate of infusion of that loading dose.

The paediatric prescriber, which we understand was available to the doctors to assist them, says at 311-023-014 -- I think it's there. I think it refers to it being a "slow push of phenytoin" -- there you are -- and it gives you the rate.

In your view, should the rate for that loading dose have been prescribed?

A. Well, it's normally given, I think, over 15 to 20 minutes and it's done with an ECG being recorded at the time. I think it's well enough known amongst paediatric circles as to how you do this. So I'm not absolutely sure that it's necessary.

Q. If it was a junior doctor doing it, a very junior doctor doing it without supervision --

A. Then it would be so -- I suppose you could feel the need for that.

Q. You've referred to it done with an electrocardiogram. Dr Aronson's report does refer exactly to that. It's at 237-002-012. He says:

"During the intravenous administration of phenytoin, continuous monitoring of the electrocardiogram is essential. However, there is no need to monitor continuously after the end of an infusion if there is no

evidence of cardiac toxicity during the infusion and for about 30 minutes after. Nevertheless, it is wise in such cases to do so."

Would you accept that?

A. Yes, I would agree that it's not absolutely necessary.

Q. No, what he said is -- sorry, just to be clear, he said two things. He said it is essential to do it while you're continuing to infuse.

A. That's true, yes.

Q. And then you wait after the conclusion of that and for about 30 minutes to make sure that you've got no adverse reaction, if I can put it that way, and then you don't have to, although he considers it wise to do so. My question is: would you accept both those things?

A. Yes, I accept them.

Q. So it is essential to do it while you are actually infusing?

A. Yes.

Q. Is that something that should be noted? Because there appears to be a note of that happening for the 2300 hours administration, which is at 090-040-138, but there's absolutely no note of that happening for this dose at 2.45.

A. Is the second dose a slow infusion?

Q. Yes.

A. That's a different matter.
Q. So you wouldn't do one for the loading dose?
A. You would do it for the loading dose; you would not do it necessarily for the subsequent dose.
Q. They seem to have done it the other way around. At least there's absolutely no note of it being done for the loading dose, which is in fact the overdose, if I can put it that way, there's no note of that, but there is a note for the subsequent one.
A. Yes. Well, I think that should have been mandatory.
Q. It should have been mandatory?
A. Yes.
Q. In fact, I think Dr Aronson has also referred us to the product information at 237-002-038. I think you can see, under "Method of administration", it says:

"Continuous monitoring of the electrocardiogram and blood pressure is essential."

And it goes on even to say that:

"Cardiac resuscitative equipment should be available and the patient should be observed for signs of respiratory depression [and so on]."

Would you accept that?
A. I think that may be overdoing it a bit. I think the primary push of dose is where it's really important, but there's probably no reason for removing an ECG if

you have one running, but the major problem is going to be in the first 15, 20 minutes, and the subsequent short time afterwards of about half an hour.

Q. Then Dr Aronson refers to something where he says that we should actually seek a clinician's view on it, and we see it at 237-002-010. This is an issue as to whether the overdose of phenytoin could have affected her presentation and may have had a depressing effect or a lowering effect, if I can put it that way, on her Glasgow Coma Scale.

He says that if it had had that, or it was thought that it could have had that, then it wouldn't necessarily be a reason for withholding effective treatment, but the clinician who'd administered it should make an allowance for its effects when he is recording the neurological markers of progress; would you accept that?

A. Yes.

Q. Obviously, they didn't appreciate there had been a phenytoin overdose. That's the first point. But even if they had, how would you be able to factor that into Claire's presentation at that time?

A. Her Glasgow Coma Scale score.

Q. Yes. I appreciate that, professor. What I meant to say is: how would you know how much allowance to make for it

when you were calculating her score?

A. You'd look for a potential drop and expect it to rise again after one to two hours. But as I say, I don't think phenytoin is a particularly sedative drug, so I'm not sure that it's very relevant.

Q. One of the issues that I had asked you about on Thursday was what you thought the likely effects of administering the 635 rather than the 432 of phenytoin --

A. Yes.

Q. -- and you deal with that at pages 174 and 176. We don't really need to pull them up; I'm doing it for reference purposes. Essentially, you're saying that you don't think it necessarily would have had very much effect. I asked you that particularly in relation to the seizure at 15.25. Maybe if I can find your answer in the transcript to that. I think that might be relevant to have up. That might be page 176.

A. Can I be reminded of the timing of ...

Q. Of the seizure? That's 3.25 in the afternoon of the Tuesday.

A. I see the timing of it, but when was the phenytoin --

Q. The phenytoin was given at 14.45.

A. And the question is?

Q. Perhaps what I'd better do is put up what Dr Aronson thinks in relation to that administration because

you have expressed a view on that. It's to be found at 237-002-011.

He says that:

"Toxic concentrations of phenytoin can be associated with paradoxical seizures, but it is impossible to say in Claire's case whether the seizure at 15.25 was due to phenytoin toxicity, an underlying infection, hyponatraemia, some other cause, or a combination of any of these."

But nonetheless, although he's not able to disentangle all of that, in terms of whether in principle a toxic concentration -- he considered that to be a toxic concentration -- could be associated with a seizure, his view is it could.

THE CHAIRMAN: Just pause a minute. What exactly does he mean by "a toxic concentration"? Do you understand what that means?

A. Yes, I think he's referring to a level which is just above the normal range for that drug.

THE CHAIRMAN: Okay.

A. And I'm saying it's not much above the range and I would have thought it rather unlikely.

MS ANYADIKE-DANES: Having expressed that view, he then attached a number of papers and material, which address that point. And I think one of the reasons he thought

it was toxic -- in fact, we can see that at 237-002-010 in answer to the chairman.

It's:

"The usual range of serum concentrations that is associated with a beneficial effect is 10 to 20. Toxic reactions are more likely at concentrations above 20 milligrams per litre."

And then he works back from what Claire's phenytoin saturation was and concludes that she had received a toxic concentration of phenytoin. It was, in fact, of course, 50 per cent more or thereabouts than Dr Webb had intended she receive.

A. Yes.

Q. In the papers that he refers to, if I can take the first one, to be found at 237-002-103. That is a paper which is entitled:

"Refractory idiopathic absence status epilepticus: a probable paradoxical effect of phenytoin and carbamazepine."

If one sees in the conclusions there, the top right-hand box under conclusions:

"Our observations strongly suggest that therapeutic concentrations of phenytoin and carbamazepine exacerbate idiopathic generalised epilepsies. Subjects in whom absence is one of the seizure types seen are at

a particularly higher risk for responding paradoxically."

And then it goes on to say:

"These findings underscore the value of accurate classification of seizures and particularly the syndromic approach to diagnosis and point to the potential for iatrogenic complications with indiscriminate use of anti-seizure drugs."

Then he also refers to a paper at 237-002-117. That paper is "The aggravation of epilepsy by anti-epileptic drugs to non-specific manifestations of drug toxicity". It starts off:

"This phenomenon has been documented with phenytoin."

That's the reference there. It's the last line on this -- "... another non-specific manifestation occurs". Sorry, I'm trying to find it on my particular sheet.

A. It's well-known that this phenomenon does follow the use of these drugs in idiopathic generalised epilepsy. That is clear.

Q. Yes.

A. But they are drugs for focal seizures and these are -- there is a risk of this occurring.

Q. Sorry, what I was pointing you to -- this is a whole section dealing with the effects of this. This

particular block is the non-specific manifestations of drug toxicity, and it really starts at the bottom:

"Another non-specific manifestation occurs when toxic levels of an AED [anti-epileptic drug] have a pro-convulsant effect."

And it goes into the bit that I had just read out:

"This phenomenon has been documented with phenytoin."

I think from what you have just said there, it is known that phenytoin can have that effect.

A. Yes, it is.

Q. And it goes on in the following page, 118, under "Paradoxical effect", it refers to:

"This refers to exacerbation of seizures by an AED that is usually effective or is an appropriate choice for that epilepsy or syndrome."

It goes on:

"Given our relative state of ignorance on the mode of action of most AEDs, it is not surprising that these drugs may have unexpected effects, which may not ultimately prove to be paradoxical."

It says:

"It is not too difficult to speculate on how drugs that increase inhibition or decrease excitation might tip the excitatory/inhibitory balance in the opposite

direction from that expected [and it gives an example] and despite the proclamations of rational polytherapy, much beloved by the satellite symposium, we do not understand enough about the brain, its disorders or the drugs we administer to be always able to predict how they will affect a given patient and paradoxical effects associated with specific AEDs ..."

And then he describes them below.

So I understand then from what you're saying that you doesn't necessarily disagree with that.

A. No, I don't.

Q. Does that mean that you couldn't necessarily exclude the possibility that that loading dose or stat dose of phenytoin, if it didn't in and of itself cause that seizure at 13.25 [sic] could nonetheless have contributed to it?

A. Yes, it could.

Q. It could. Then further phenytoin is administered at 2300 hours. This is administered over an hour. It had been prescribed that Claire's phenytoin levels should be checked. And the bloods are taken for that, they are checked, but the result doesn't arrive back, at least so far as it's recorded, until 23.30. And the result of it is 23.4 with a range of 10 to 20. But that result doesn't happen until halfway through the infusion of

phenytoin, so what I'm asking you is: can you comment on that step of commencing the phenytoin infusion at 2300 hours without having the results of her phenytoin concentration levels, without having had a CT scan, an EEG or any serum sodium results at that stage?

A. Without the EEG as well, no, I think it's quite difficult, but you could certainly -- if you knew you were giving an overdose, you would reduce that dose.

Q. Yes. My point was slightly different, which is: at the time they administer that infusion over an hour, they had intended that they would have the results back showing what her phenytoin concentration levels were. In fact, they did not have those results back. They did not have those results back until 11.30 at night, but at 11 o'clock, they start the infusion.

A. Yes.

Q. And as at that time, they haven't done a CT scan, they haven't got an EEG and they don't have any serum sodium results. So what I'm asking you to do is to comment on the advisability, if I can put it that way, of having started that second lot of phenytoin.

A. Of course, I wouldn't have started it in the first place.

Q. I understand that. But given that --

A. So it's very difficult, really.

Q. I understand that. I'm just trying to gain from you your comment on a doctor doing that in the absence of, at the very least, the concentration levels of phenytoin in her system.

A. I think you would have waited if that's what you were planning to be doing, yes.

Q. Thank you. When you were giving your evidence, you also said -- I'm now moving on to midazolam --

MR COUNSELL: Before my learned friend does move on to midazolam, I wonder if Professor Neville could be asked to clarify his evidence. Because he has been taken through a good deal of material, all of which, as I understand it, is literature published since these events, and asked about the effect of this overdose of phenytoin. I'm referring to the earlier one and to the reports from Aronson. Professor Neville's evidence on Thursday, when asked about the effect of phenytoin was -- and this is in the transcript on page 175:

"I don't think that it would probably make a major difference. The levels at which you tend to go off the scale on this drug are not linear so that it will have a higher ... At the end, it will actually rise quite sharply, but it seems to have been tolerated reasonably. So probably not much effect."

Then you'll recall, Mr Chairman, that he went on to

explain that a little bit later.

Professor Neville has now said that it could have an effect and what I'm wondering is whether anything that he's been taken to this morning, in respect of after-the-event literature and the views of others, causes him to alter in any way the view he expressed last Thursday.

MS ANYADIKE-DANES: Thank you very much.

I wonder if I might preface it by this: the publications that were attached to Dr Aronson's report -- not all of them -- are 1996 publications. But the views expressed, can you help us with whether that kind of knowledge was had in 1996?

A. Yes, I think phenytoin was very well-known from 40 years of use, so that I think we were used to using it, used to giving it intravenously, and used to its effect. So what I said on Thursday, I would agree with today.

Q. Yes.

THE CHAIRMAN: So just to get this: what you were agreeing with today is Dr Aronson's statement at 237-002-011, which is that it's impossible to say whether Claire's seizure at 3.25 was due to the phenytoin toxicity, underlying infection, hyponatraemia, some other cause, or a combination. And you agree with him, it's impossible to say, but your evidence on Thursday was

that you thought that that was ...

A. I hope I meant it was unlikely and I still think it was unlikely.

THE CHAIRMAN: That's the point, thank you.

MS ANYADIKE-DANES: Having said that you thought that it was unlikely, if you are back in the situation the clinicians were in the afternoon of 22 October -- we have the benefit of hindsight, so you're able to say things that have been confirmed subsequently and/or have been perhaps excluded subsequently. At that stage, all the clinicians and nurses see are Claire's actual presentation. They know what medication is being given, they know what the results are to the extent that tests have been carried out, and that's the information that they have. And if, as you say, it was known at that time in 1996 that phenytoin could produce paradoxical seizures -- I think that is the expression that's given -- is that something that should be in people's minds, even to exclude it some time later on, but still as a possibility?

A. Yes, it should.

Q. It should?

A. Yes.

Q. Then if we go on to midazolam. I think your evidence was that to give the midazolam -- as in fact I think you

thought to give the phenytoin -- was inappropriate without there being any confirmation through an EEG of diagnosis.

A. Yes.

Q. And I think your evidence also is that midazolam has a sedative effect and could have caused or contributed to the fall in Claire's Glasgow Coma Scales.

A. Yes.

Q. I think also that your view is that 12 milligrams is and was a big dose.

A. Yes.

Q. And that there was no evidence that Claire required that dose.

A. No.

Q. Then I think, in your report at 232-002-016, you thought that was:

"... likely to have the effect of reducing her conscious level, reducing her breathing and increasing her partial pressure of carbon dioxide, PCO2s."

A. Yes.

Q. We are speaking of the 12 milligrams, not the 120. You have given completely different views as to, (a), the likelihood of that happening, and, even if it had happened, what you think the result of that would have been, which is a completely different order of

magnitude, if I can put it that way.

A. Absolutely.

Q. I wonder if I can now put to you Dr Aronson's views on the midazolam and have your comments on it. It's at 237-002-013. If we start right down at the bottom of that under "you":

"Midazolam should be given slowly by intravenous infusion, titrating the dose against the clinical response."

The loading dose of midazolam, which one finds in the notes -- at least the prescription for it -- if you bear with me one moment ... (Pause).

090-026-075. Right down at the bottom, you see:

"Midazolam, 120. Time of administration [and so on]."

There doesn't seem to have been any indication, in the way that there wasn't for the loading dose of phenytoin, for the rate at which that dose should be administered.

Midazolam was medication that I think the junior doctors -- and the nurses, for that matter -- have all said that they weren't particularly familiar with. Dr Webb's own evidence was that he went to check his notes to see what the appropriate dosage was because it was something he had come across during his time in

Canada. So if this is being prescribed and is to be calculated and administered by junior staff who are not aware of it or can be reasonably thought not to be aware of it, should there have been a direction as to its mode of administration in terms of rate?

A. Oh, undoubtedly, yes, but the dose that you've got here of 120 milligrams is just a gross overdose anyway.

Q. Admittedly, but I think --

A. So that ...

Q. Let's say, for the sake of argument, that was a typographical error and what was intended to be written there was 12. Even at that, which is also a high dose, as we understand it, but whatever the dose was, should the direction have included information for the rate at which it's actually to be administered?

A. Yes, it should.

Q. In fact, rather similar to that in relation to the phenytoin, if one looks at the medical notes and records where Dr Stevenson records it, it's at 090-022-055, there you see:

"1. Midazolam, 0.5 milligrams per kilogram, stat dose."

And there he calculates it out. But there is no rate at all.

If one looks at the second "midazolam", that's an

infusion, there is a rate for that calculated out, but there's nothing for midazolam on that initial stat dose or loading dose, and I think your evidence is that there should have been.

A. Yes.

Q. Just staying with the question of rate, Dr Aronson has included some product information. If we pull up the first -- this is dated 2011. If we pull up 237-002-058. You can see under "Children, IV administration" -- in fact, it recites some much what Dr Aronson had in his report:

"Midazolam should be titrated slowly to the desired clinical effect. The initial dose of midazolam should be administered over 2 to 3 minutes. One must wait an additional 2 to 5 minutes to fully evaluate the sedative effect before a procedure or repeating a dose."

Then there's a reference to the paediatric patients on the bottom there. Then if one goes to 237-002-061, it talks about:

"Special caution should be exercised when administering midazolam to high-risk patients."

If one looks down at that list, under "chronically ill or debilitated patients, for example ...", the third in that list is "paediatric patients". Then it says:

"These high-risk patients require lower dosages and

should be continuously monitored for early signs of alterations of vital functions."

Then if one goes across to the "paradoxical reactions", one sees that over the page at 062. It says:

"The paradoxical reactions, such as involuntary movements (includes tonic/clonic convulsions ... The highest incidence of such reactions have been reported among children ..."

Perhaps just before I conclude that and ask you to comment, along the same vein is the manufacturer's own product information. It's produced by Roche, and one sees that at 311-034-004:

"Contraindications: Hypnovel [which is the particular form of midazolam that was administered to Claire] should not be administered in patients in shock or coma."

And it goes on to deals with precautions which is something I want to deal a little later on with you. In any event, given what is being said about the paradoxical effects of it and given that she received an overdose of it, are you able to comment on how its administration should have been recorded or the directions for its administration should have been recorded in the medical notes and records to ensure that

it was given safely, even at an appropriate dose, to Claire?

A. Yes, you would have wanted, first of all, of course, to be sure that the child had status epilepticus and, secondly, because this is a child who's in coma, albeit mild to moderate -- moderate, I think -- you would want to be extremely cautious about its use. I'm not saying that although they say you shouldn't use it that you shouldn't, you would just have to use it with great care, I think, and to be watching for the outcomes. The problem is, you don't know what the outcome is because there's nothing to show you except for a potential for the child waking up.

Q. Yes. Dr Webb, in fact, in his third witness statement -- if you just bear with me while I pull it up. 138/3, and I think it's page 2. If one looks under number 1, which is asking him to set out his advice regarding the dose of midazolam, he says:

"I was contacted after the seizure that was recorded ..."

He has that recorded in the nursing notes at 3.10, but in fact that's an error and the seizure is recorded for 3.25. He says:

"I believe this contact was made by a doctor, but I cannot recall by whom. I believe I suggested midazolam

as a next option for Claire, but I would not have been certain of the dose and would have had to check this by reviewing papers kept in my office. I believe my communication with the medical staff in relation to this was likely to have been by phone as I did not attend the ward until some time later and did not write the dose myself in Claire's notes."

Leaving aside when he may have been contacted about this -- because there may be a difference in the evidence as to when he was contacted -- but what Dr Webb seems to be saying in his evidence is that he suggested midazolam and gave the prescription over the phone about it without actually examining Claire at the same time as having prescribed this. Can you comment on the advisability of doing that?

A. But he had already seen her.

Q. He had seen her at 2.

A. At 2, and had presumably discovered that she hadn't changed. So I think, assuming that the idea was right that he should be treating status epilepticus, he could do that.

Q. How much time, if at all, do you think he should have spent explaining what midazolam is and some of its potential effects, if I can put it that way?

A. I think he should have explained both the anticonvulsant

effects, the paradoxical apparent use of this drug in this child, who was apparently not fitting, and the wish to thus wake the child up. I think that is the sequence that both the doctors and the parents should understand.

Q. Sorry, I didn't hear --

A. I think the parents and doctors should understand that was the aim, that they should be -- in this child who was not apparently fitting, but was thought might be fitting, they should be expecting them to waken.

Q. Thank you. I'm going to ask you a little bit about what the product information says about the contraindications and also the precautions. Before I do that, I'd like to ask you about what Dr Aronson says when he says that we should seek the views of a paediatric neurologist. He says that at 237-002-013.

He's referring back to the summary of product characteristics, some of which I had read out to you before. We see it just above (y):

"Hypnovel has not been evaluated for use as an intravenous sedative in children."

Then he goes on to say:

"That being so, I cannot comment on the off-label unlicensed dose of intravenous midazolam that would have been appropriate in a 9 year-old child with suspected status epilepticus and would seek the opinion of

a paediatric neurologist."

Then he contrasts that with:

"Intravenous diazepam and intravenous phenytoin have status epilepticus specifically listed as an indication in their respective summary product characteristics."

The summary product characteristic that he is referring to is dated 2011, so he is saying what he does say there. Can you express a view as to whether you would have thought, if that's the case in 2011, whether you would have thought, in 1996, it was appropriate to administer Hypnovel to Claire?

A. It was in reasonably regular use in a number of units as a sedative, so I think it was appropriate that it could have been used if that was the appropriate indication, yes.

Q. If what you were trying to do was to --

A. Well, if you were trying to either sedate or stop the -- or wake the child if they were fitting.

Q. Can you express a view, from your expertise and experience, as to if it was appropriate to administer Hypnovel to Claire?

A. No, I don't think it was, because we didn't have proper evidence that the child was fitting.

Q. Yes.

A. But is that the ...

Q. There are two things. One, whether, on the basis of the information that he had, you think it's appropriate for him to have prescribed it. Another question, which you have just answered, is whether in your view you would have prescribed it in his position.
A. That's right.
Q. So if we deal with the first one, standing in his shoes with what is recorded there.
A. Then it's reasonable to give -- and I think you've accepted the fact that there is an overdose, but you've decided to not take notice of that, but just carry on.
Q. But even the 12 is an overdose?
A. Yes.
Q. Yes. If I then take you to the circumstances, which is the manufacturer's product information, and go back to 311-034-004. There are the precautions. Perhaps if you enhance the precautions, the whole paragraph. First of all, it says:

"[It] should never be used without individualisation of dosage. It should not be administered by a rapid or single bolus IV administration."

If we just pause there for a moment, does that constitute a single bolus IV administration?
A. I think it does, really.
Q. Sorry?

A. I think it does, really, yes.
Q. It does?
A. Yes.
Q. Dr Webb refers to it when he sees Claire at 5 o'clock at 090-022-055. If we have that very briefly and then we'll go back to this. There he says at 1700:

"Claire has had a loading dose of phenytoin and a bolus of midazolam."

So he seems to describe it in that way.

A. Yes.
Q. And then if we go back to where we were, he says:

"[It] should not be administered by rapid or single bolus IV administration."

I think your view is that's exactly what happened at 15.25. Then it says:

"[It] should only be used in settings with equipment and skilled personnel for continuous monitoring of cardio-respiratory function and resuscitation procedures. Patients should be continuously monitored for early signs of underventilation or apnoea and vital signs should continue to be monitored during the recovery period."

Would you accept that?

A. Yes.
Q. "During the IV application of Hypnovel, respiratory

depression, apnoea, respiratory arrest and/or cardiac arrest have occurred and, in some cases where this was not recognised promptly and treated, hypoxic encephalopathy or death has resulted. These life-threatening incidents may occur especially if the injection is given too rapidly or with excessive doses. Particular care must be used in administering the drug by the IV route to ..."

And then it has a list of people. "Very ill patients" in one of them:

"... because of the possibility that apnoea or respiratory depression may occur. These patients require lower doses, whether pre-medicated or not."

Would you accept that too?

A. Yes.

Q. If that's the case and it requires that sort of attention, when I had asked you before if the junior staff and possibly also the nurses who are conducting the hourly obs should have had the characteristics, if I can put it that way, of midazolam explained to them, do you think it should have included this quite specific information that is being given out by the manufacturers?

A. Yes, I do. I think that this was obviously relatively unusual in this particular unit, and therefore I think

they should have taken a bit more trouble over this. But these warnings, of course, are made as severe as they can as well.

Q. Of course.

A. So that they are ... Because, of course, they have to be.

THE CHAIRMAN: To cover the manufacturers' back?

A. Yes.

MS ANYADIKE-DANES: But they stem from a kind of concern.

A. Oh yes, they do, they're there and they should be taken note of.

Q. Would you say at least the continuous monitoring?

A. Yes.

Q. When I had read out to you before from Dr Aronson's report what he thought the onset of action was, he has the onset of action of midazolam being two minutes, according to him. It's also that midazolam should be given by a slow push and it's also the case that Claire received an overdose of midazolam in terms of the amount that the other experts have considered would have been appropriate.

This is something that obviously we're going to ask Dr Aronson because he's looking at not just the midazolam, but the combination effect of all the medications and when they were given and when their

respective periods of action would be, but is it at all possible in your view that in the light of all of this that one can't exclude the possibility that that loading dose of midazolam at 15.25 actually contributed to or produced the seizure that Claire's mother witnessed?

A. It could have done.

THE CHAIRMAN: I'm sorry, I thought that you had agreed about half an hour ago with Dr Aronson saying it's impossible to say what specifically caused the seizure at 3.25 --

A. Sure.

THE CHAIRMAN: -- whether it's one of a number of drugs or a combination of the drugs, et cetera.

A. Yes, I hoped to be saying the same thing in a slightly different fashion by saying that it could have been that, but I couldn't say further than that.

THE CHAIRMAN: And you have agreed with Dr Aronson, who says it's impossible to say. So if it's impossible to say, that means nothing can be ruled out as a possibility.

A. No.

THE CHAIRMAN: I'm not sure how much it's going to advance the inquiry to say something is possible because it's not impossible because that's the second time this morning we've been through this.

MS ANYADIKE-DANES: I think what was being put there was

that the focus was on the phenytoin at that stage.

MR COUNSELL: Professor Neville's evidence on Thursday in relation to this question of midazolam was -- and this is the bottom of page 176 of Thursday's transcript:

"It's possible particularly that midazolam can excite seizures of a different sort. I think it's much more likely that these were due to low sodium levels or they were the effect of hyperextension attacks, which were not seizures."

So it may be that --

THE CHAIRMAN: I think he went on to say that we'll never know.

MR COUNSELL: Exactly.

THE CHAIRMAN: This is not really advancing the inquiry and we've got limited time with Professor Neville today. I think we should move on.

MS ANYADIKE-DANES: Thank you.

Then Claire suffered a respiratory arrest, which is recorded at about 2.30 in the morning of Wednesday. In your view, given the possibility that midazolam itself can produce respiratory arrest or contribute to it, given that she had had this dose and she was then on a continuous infusion of midazolam at that time, is it possible that midazolam contributed to that?

A. Yes, it is.

Q. Thank you.
THE CHAIRMAN: Is that possible in the sense that we'll never know?
A. Yes.
THE CHAIRMAN: Thank you.
MS ANYADIKE-DANES: I think that I had asked you about whether some consideration might have been given to transferring Claire to intensive care. I think the answer that you gave -- I'm just trying to benchmark it really -- was that that is something that could have been in the physicians' minds --
A. Yes.
Q. -- but not necessarily to have actually done it at about 5 o'clock when I think Dr Webb sees her again.
A. Yes.
Q. But it's something he could be considering --
A. Yes.
Q. -- depending on her presentation?
A. Yes.
Q. When Dr Webb does see Claire at 5 o'clock, what, in your view, should he have had in mind given what her recorded presentation is and all that's happened in terms of medication prescription and the things that they don't know because they haven't carried out the tests at that stage or haven't got the results back? What do you

think he should have had in mind at that stage?

A. I think his mind should have been on the fact that the child was not better -- and you can argue about whether the child was worse or not. I think it probably was a little worse, and the parents certainly thought that Claire was worse. Therefore, they should have been rethinking this diagnosis of epilepsy and saying, what else could it be? And amongst those things are acute brain swelling or an encephalitis that's progressing despite the attacks.

Q. When they're wondering what else could it be, given that they are very concerned about her neurological presentation and the extent to which any of that may be down to her previous history, if I can put it in those terms, they would have known that Dr Elaine Hicks had been Claire's consultant while she was a baby, in 1987, and had been trying to ascertain what the cause was of her presentation then, which is described in records of attacks variously as "seizures", "absences", "rolling of eyes" and so forth. But at that stage, she had been brought in and was under the care of Dr Hicks, who was a senior paediatric neurologist.

A. Yes.

Q. To what extent do you think any of them should have given some consideration to try and contact Dr Hicks to

see if they could learn anything about Claire's presentation from how she had appeared then?

A. I think in a general sense finding somebody else to talk to would be extremely helpful if you're in a position where you don't know quite honestly what is happening. So I think that's in the general sense. I think that you would normally see children who have had infantile spasms or a similar sort of disorder following slow development and you'll have seen some of them apparently cured of their epilepsy and some of them not. So you'll have that picture. It may be that there's nothing more that could be actually added, but you don't know, of course, until you've tried to find the person and seen whether they've got some additional point which they want to make.

Q. Yes. I'm conscious that it may be that Dr Webb was rather short of people to bounce ideas against with the appropriate level of, not just expertise, but seniority and experience.

A. Yes.

Q. He didn't appear to have access to Dr Steen, who he might have discussed things with. Dr Sands may not have been available to him in the afternoon, he may have been tied up in a clinic.

MR GREEN: If I just add the observation, please, that

Dr Sands, we must all remember, was a registrar and had only been a registrar for four months at that point.

MS ANYADIKE-DANES: I'm coming to that -- but in any event, had actually sought his advice. So in terms of those senior people to whom Dr Webb might have access, would it not have been a prudent thing to have seen if he could reach Dr Hicks?

A. Yes, it would have been helpful.

Q. Thank you. Mr Chairman, I'm conscious of the time.

THE CHAIRMAN: Okay, we'll break for ten minutes and we'll resume -- Professor Neville has to leave at 1.

(11.13 am)

(A short break)

(11.33 am)

MS ANYADIKE-DANES: Professor Neville, the counsel for Dr Webb had indicated that Dr Webb's views had changed between his examination of Claire at 2 o'clock -- when all that really seems to be recorded is concerns about her neurological presentation and a continuation, perhaps, of the original view of non-fitting status -- and then his examination of her at 5 o'clock.

If we look at what happens at 5 o'clock, one can see that at 090-022-055. Perhaps if we just highlight from "17.00" down to the signature. Firstly, he takes some cognisance as to the medication that's been prescribed.

And he takes further background from Claire's mother. Then he has a plan. It's a three-point plan, if I can put it that way.

The first part of it seems to refer to antiviral medication; would that be right?

A. Yes.

Q. Although he says he doesn't think that meningoencephalitis is likely, but nonetheless he's covering for it. Can you comment on that and doing it at that stage as opposed to at any other time?

A. I think I would have done it much earlier because I think that her state was unexplained in the first place.

Q. Of course, earlier, much, much earlier, the previous evening, if he was looking at the notes, he would have seen that Dr O'Hare has already queried, albeit that she's excluded it, encephalitis.

A. Yes.

Q. And then after the ward round, or at some point during the ward round, Dr Sands has taken the view that encephalitis is possible and seems to have, according to his evidence, discussed that with Dr Webb as a result of which he adds "encephalitis/encephalopathy" to that note. If that's a discussion that happened shortly after the ward round, then from the morning, if I can

put it that way, there has been a concern or additional differential diagnoses that those conditions are involved and it's not just the non-fitting status.

A. Yes.

Q. Given that he saw Claire at 2, is there any reason why he wouldn't have started that at 2?

A. No, I can't see why not, no.

Q. And when he says "I don't think meningoencephalitis is very likely", but nonetheless he is suggesting that they provide that medication, can you understand from his note or how do you interpret his note as to why he's doing it?

A. I think he's had no real result from treating status epilepticus, so he's trying something else, and really he could have tried both in the first place.

Q. Yes. But can you help as to trying something else, but still with no tests or results to base the direction that you should go on?

A. No, well, he hasn't got the earlier -- well, that day's sodium level. Though I don't think he's fully aware of that fact. Then he doesn't have EEG evidence and he's not got CT evidence of the possibility of Claire having meningoencephalitis either. So he's working largely in the dark.

Q. Yes. Quite apart from the difficulties that he has

given evidence about in relation to CT scans and EEGs, on the other evidence that he could have got perhaps from full blood workup and the serum sodium levels, is there any reason why you wouldn't be trying to pursue your evidence and then formulating your treatment plan in the light of your evidence as opposed to formulating your treatment plan?

A. Sorry, I'm a little bit confused. It's because of the number of uncertainties that there are in this argument, all of which are potentially soluble. But I find it difficult to answer that question, sorry.

Q. I phrased it badly. It's really just what seems to be happening here, and it's really a methodology because he's also a consultant paediatric neurologist, but the method that he seems to be adopting is to, from her presentation and that sort of fairly basic information, to formulate a treatment plan based on a number of hypotheticals as to what it should be, as opposed to getting in actual results to see what's happening and then formulating your treatment plan in relation to those results.

A. Yes, absolutely, yes. No, he should have been trying to obtain these results and made absolutely sure that he knew what the sodium levels were that morning, I believe, and that he knew the EEG and the CT scan,

that they were available or coming to be available.

Q. Is that fairly basic, that that's the way you approach refining your diagnosis?

A. Yes. If you have a child who's in coma and you don't understand that state, then you investigate in that set of simple ways, really.

Q. Then the second point of his plan was to:

"Check viral cultures, query enterovirus, stool, urine, bloods, T/S."

Is that all appropriate at that stage?

A. It's appropriate, but it doesn't explain the level of coma. That requires a sort of separate explanation.

Q. That second part of the plan, is that also something that could have been embarked on earlier?

A. No, I think they just take a little while, so I think you have to try and get those in the course of a couple of days or so. That's more difficult.

Q. No, sorry, I meant to request it.

A. Oh yes, to request it is fine, but it will take a while to get those results.

Q. And if that's the case, is it therefore something that should have been requested earlier?

A. This is him actually asking for them?

Q. Yes.

A. Oh yes, then it should have been asked for.

THE CHAIRMAN: This is your original analysis, professor, isn't it, really, that by Tuesday morning at the latest there should have been a series of further tests required?

A. Yes.

THE CHAIRMAN: Those results would have started to come back during Tuesday --

A. Yes.

THE CHAIRMAN: -- so that instead of the doctors and nurses working on rather uncertain diagnoses, the range might have been narrowed down when the results came through?

A. Yes.

THE CHAIRMAN: And in the absence of those results having gone through, Claire's condition doesn't improve or perhaps deteriorates as Tuesday goes on and there's really not much greater knowledge by Tuesday evening than there was on Tuesday morning.

A. That's right.

MS ANYADIKE-DANES: Thank you.

Then I think in your report, apart from actually dealing with those very matters that the chairman had raised with you, you say that:

"Any review of Claire's condition should also have included a review of the prescribed drugs."

And you have discussed those, and also the record of

attacks. Over and above the Glasgow Coma Scale observations, is that also something that he should have looked at?

A. Yes.

Q. There would only have been two at that stage, but if we pull up the document which is 090-042-144. So only the first two things will have happened because the first is the 3.25 and then the 4.30. Everything else is after that examination at 5. But just stopping there, and perhaps if we pull up the Glasgow Coma Scale sheet that I had provided to you before so that we can compare them, 310-011-001.

This has been, professor, modified slightly because we went back and checked some of those -- you may recall there was a concern as to how those numbers didn't appear to be quite right when you were looking at it on Thursday. So we've gone back and this is now checked and it has been corrected. It makes no difference to the total, but some of the internal values have changed. So that's it there.

We have also added, because it's been considered relevant by one party, the times when the shifts change. So if you see the two red lines going down between 2 pm and 3 pm, it's a red line, and then between 8 pm and 9 pm there's a red line, and there's a nursing shift

change there in case -- because I think you conceded some of this is a little subjective -- in case that makes a difference to the actual values ascribed to these component parts of the total.

So up until 5 o'clock, he would have had those Glasgow Coma Scale scores and then he would have had the record of attacks at 3.25 and 4.30. You have described those attacks and distinguished them from seizures and attributed them to perhaps a different cause. If he had that information, what do you think he should have understood was happening as a result of the description of, "strong seizure, lasted five minutes, sleepy afterwards", that's 3.25, and then the 4.30, which is, "teeth tightened slightly; state afterwards, asleep"?

A. It could be that they're two separate events and the first one sounds more like a proper seizure. The second sounds very like a sort of tonic attack, which could indicate just raised intracranial pressure. So I think seeing those sorts of attacks, it should have been possible to suggest that this child might have raised intracranial pressure.

Q. The first one, which you say could be of a different nature and be a proper seizure, of the range of possibilities that he might have been reflecting on, what could have given rise to that?

A. The very likely cause of that would be hyponatraemia. But it is possible that the child had continuous seizures as well. We just don't know.
Q. But in terms of the range of possibilities --
A. Hyponatraemia is high on the list.
Q. And that teeth tightening, does that derive from a different cause?
A. Yes.
Q. What's that caused by or could be caused by?
A. It's caused by the tentorium, the posterior part of the brain being squeezed, thus it extends and you get that sort of episode without there being any form of overt seizure on the brain.
Q. What causes that part of the brain to be squeezed or, out of the range of possibilities, what might have caused the brain to be squeezed?
A. It's because the brain is slowly swelling.
Q. Does that not therefore mean they ultimately come down to the same cause?
A. That teeth tightening slightly, that one is highly likely to be just a tonic extension attack without it being a seizure. The first one is much more likely to be a proper seizure. It's the best I can do.
Q. I understand so far that you've got them as different things. But the seizure one, you say that would be

hyponatraemia, and maybe in this way then: how does the hyponatraemia give rise to that kind of seizure without it also being caused by cerebral oedema?

A. Oh, well, it's part of the process whereby, if you drop your sodium fast, you cause a release of excitotoxic events, so it's just an effect of that event.

Q. I see.

THE CHAIRMAN: Is that why each of those two incidents is highly suggestive of developing hyponatraemia or is that putting it too far?

A. Yes, it would, because both would have ... But particularly, I think, the second would make that possible.

MS ANYADIKE-DANES: Does the second not suggest that the hyponatraemia may have developed to a stage whereby it's now causing cerebral oedema? Because you have linked that type of episode to the swelling of the brain.

A. Yes.

Q. And that would be the cerebral oedema?

A. Yes.

Q. So the 3.25 may have been caused by the fall in sodium, whereas the 4.30 may have been that the brain is already starting to swell, apply pressure, and that's producing that kind of episode?

A. Yes. I think you may be slightly overinterpreting how

far I can actually take this.

MR SEPHTON: I wonder if the professor could be asked if the attack at 4.30 might also have been caused by a breakthrough epileptic attack.

A. Yes, it might have been.

MS ANYADIKE-DANES: And could either of those, if one leaves aside hyponatraemia and cerebral oedema, have been -- well, maybe it's the same thing as my learned friend has just asked -- a tonic attack due to status epilepticus? Is that the same thing as my learned friend has just asked?

A. Well, yes, it would be.

Q. So that would be a reason for keeping both those potential diagnoses --

A. Sure.

Q. -- on the books, as it were --

A. Yes.

Q. -- because there has not been anything to have distinguished between them either way and therefore excluded either one?

A. No, the only thing that had perhaps changed is the failure of the drugs to change the outcome. They were still in coma.

Q. Does that mean if the drugs haven't addressed it, does that point you more towards the hyponatraemia --

A. Yes, it does.
Q. -- as opposed to the non-fitting status epilepticus?
A. Yes, it does.
Q. And in answer to my learned friend, when he asked if it could have been a breakthrough epileptic seizure, how likely is that given the amount of anticonvulsant drugs she had been on since 12.45 with the diazepam?
A. I think it's relatively very unlikely.
Q. Thank you.
A. That's about as far as I can take that, I think.
Q. I understand. Dr Webb has relied on certain articles dealing with the average time for the cessation of seizures and regaining of full consciousness. Those are to be found at 138/3, page 5 and 6, I think. The first relates to the use of midazolam. The second is "Continuous midazolam infusion as treatment of status epilepticus".

Is there anything that you wish to comment further than you already have about the use of midazolam in relation to Claire's condition?
A. It's a rapid-acting drug and so you would expect an effect within -- certainly within 10 to 15 minutes.
Q. Then if I understand you correctly, given that it is a rapid-acting drug and it had first been administered at 13.25 [sic], we're now at 5 o'clock and he still has

one subsequent record of an episode, and her Glasgow Coma Scales are where they are, that, just so that we have it correctly, is all pointing perhaps slightly further away from the non-fitting and perhaps closer towards the hyponatraemia, although I think you've said that neither could be absolutely ruled out at that stage?

A. No. But it points in the direction of hyponatraemia.

Q. If it was doing that, then what is it that you think Dr Webb should have done at that stage?

A. I think he should have both checked on the sodium level, I think he should have done an EEG and a CT scan.

Q. At that stage, it would be 5 o'clock.

A. Yes.

Q. And --

THE CHAIRMAN: Sorry, just to go back a moment. Professor, did you just say that the midazolam -- you said it was first administered at 13.25, 1.25? Is it not 3.25?

MS ANYADIKE-DANES: 3.25. It's 3.25, not 13.

THE CHAIRMAN: Your question has been picked up on the transcript as:

"... it had been first administered at 13.25."

MS ANYADIKE-DANES: That's not correct, it's 3.25.

THE CHAIRMAN: Thank you.

MS ANYADIKE-DANES: If your view is that what he should have

done then is had an EEG, if an EEG is not available to him because it's approaching or actually out of office hours at that stage, what is the other option, or what are the other options?

A. The other two investigations are both CT scan and sodium levels.

THE CHAIRMAN: And they become even more important if you can't do the EEG?

A. Yes. At least you can treat the low sodium, whether or not the child is fitting.

Q. Then the sodium valproate, that is administered at 5.15 with cefotaxime being administered at 5.30. If we stick with the sodium valproate, which is another anticonvulsant, as the third part of his plan, if I can put it that way. At that stage, given what had happened in relation to the use of the other anticonvulsants, diazepam, phenytoin, midazolam, what do you think the benefit was of administering sodium valproate at that stage?

A. Really quite a low chance of relieving anything, seizures ... I think it would ... That the chances would have been quite small that it would have done anything useful to the seizures if they had been present.

Q. Well, if they were being present, why wouldn't they have

been addressed by the diazepam, the phenytoin and the midazolam, but could be addressed by the sodium valproate?

A. I suppose it's a different drug, but, overall, the current drugs that we used, that is phenytoin and the diazepam/midazolam, they're really pretty effective as well.

Q. So what are the chances, so far as you can tell, of them not addressing her as they had considered it to be seizures, and yet the sodium valproate, being administered at 5.15, doing it?

A. Quite small. 10 to 20 per cent, perhaps.

Q. Before we go on to my next point, which will be about consultant responsibility, I wonder if I can pull up one document that had been provided to try and see what the interrelationship is between these different conditions and their presentations, which is at 310-014-001.

This is a schematic that the inquiry was assisted by Dr Scott-Jupp, who is a consultant paediatrician, to try and -- in a very, very simplified way -- indicate what the relationship between these various conditions are and how they might appear.

Can you assist us in understanding, even if it's simply to say that this could be improved upon in some way if you really wanted to try and represent what was

happening?
A. I think that the retention of water, the hyponatraemia and cerebral oedema, they're clear.
Q. Yes.
A. If you then go back down to hypotonic fluids, yes, that's correct as a likely cause. Then you seem to move on to three separate things, each of which could contribute. Encephalitis can cause cerebral oedema. That is true. Status epilepticus, really rather unlikely, I think, in this setting. And encephalopathy is really just, as we've said, a general sense of something being wrong with the brain. But a metabolic disorder or a toxin, they could also cause swelling of the brain, which was not related to hyponatraemia.
Q. Yes.
A. So you have some separate causes at the bottom, what might cause it, but you've got a likely causation sequence of retention of free water, hyponatraemia and cerebral oedema.
Q. Yes. And if we go to that top cycle, which is in the green, the hypotonic fluids don't get administered, obviously, until Claire is admitted.
A. No.
Q. And they don't really start until some time after 8 o'clock when Dr O'Hare prescribes them.

A. Yes.
Q. So at that stage, though, she has already been admitted with a certain presentation which is of concern.
A. Yes.
Q. What, therefore, so far as you could tell, would start that presentation, which could then be taken over or added to by the hypotonic fluids?
A. Well, the start of it would be a situation in which there was perhaps a degree of hyponatraemia, but not that severe, but combined with a degree of dehydration because she was vomiting. I think it's likely that there was something else wrong and that she had a virus infection as well that was also affecting her. The later stage is of giving a lot of hypotonic fluid and then watching the process just occur before you.
Q. And if we take the syndrome of inappropriate antidiuretic hormone, the SIADH, that can itself lead to the retention of free water --
A. Yes.
Q. -- which can lead to hyponatraemia and into the cerebral oedema cycle, if I can put it that way?
A. Yes.
Q. What would trigger that response?
A. It seems more common in children with a neurological problem, and there are also problems quite outside this

area in which this also occurs. So I think that's what is thought to be the reason that this sometimes occurs.

Q. So could it be that some or other of those blue boxes at the bottom could have led to the SIADH --

A. Yes.

Q. -- and then moved into that cycle, which may have been exacerbated by the administration of the hypotonic fluids?

A. Yes, that's a likely sequence, yes.

Q. Is that the most likely?

A. Yes, the most, yes. Well, I suppose status epilepticus is more a potential exhaustion from them, but it doesn't ... It just ... But non-fitting, I don't think it so commonly does that.

Q. So in other words, it's the encephalitis --

A. Yes.

Q. -- or something in that encephalopathy, the rather large box of potential things that could have had that effect, produced the SIADH, she is vomiting so she's slightly dehydrated, and you use hypotonic fluids?

A. Yes.

Q. And that combination could have taken you into that cycle?

A. Yes.

Q. And if that's the case, from what you have said, what

becomes the most important thing then that is driving the ultimate fatal cerebral oedema?

A. Well, it becomes a matter of carefully monitoring what's happening to the sodium levels and making sure that the fluid that is given is appropriate.

Q. Yes. If the SIADH had been triggered, if I can put it that way, by the encephalitis, if that was the case, and then you get to the SIADH, which is now affecting the retention of free water, which is not assisted by the application of hypotonic fluids, could you have addressed the consequences of that without actually having dealt with the encephalitis?

A. Yes. Yes, you could, yes. That would be entirely possible.

Q. Sufficient so that Claire wouldn't have deteriorated in the way that she did?

A. I think not from acute brain swelling, I think she would have -- yes, I think that's correct. As it happens, there wasn't any evidence of encephalitis.

Q. No. I appreciate that. Sorry, just so that we're clear about it and how it would work, the progress of it: are you saying that even though the encephalitis might have led to the SIADH and its effect on retention of water, which then, combined with the application of hypotonic fluids in circumstances where she might have been

slightly dehydrated, you could not have treated the encephalitis, addressed the fall in sodium --

A. Yes.

Q. -- and avoided the fatal outcome --

A. Yes.

Q. -- she would have still been ill with the encephalitis?

A. Yes, that's right.

Q. But that could have avoided the fatal outcome?

A. Yes, it could.

Q. Just one point at this stage because I'm about to move on to the consultant responsibility, and I have been asked to put one point to you. Dr O'Hare says in her examination that:

"The fundi were normal and the discs were not blurred."

The issue is: is that significant when you're considering the possibility of excluding problems with the brain such as cerebral oedema?

A. In the early stages, it would be entirely reasonable. In the early stages, you would expect it to be normal.

Q. So that doesn't help you to exclude cerebral oedema in the same way as it didn't help you to exclude the fact that there was no papilloedema?

A. It's the same thing.

Q. Then if we move on to consultant responsibility.

I think the view that you've expressed in your report at 232-002-010 is that it seems that Dr Steen and the medical team retained primary care of Claire whilst seeking specialist advice from Dr Webb, and that Dr Webb was making suggestions and not taking over care. And I think you also think that the hospital notes should make it clear if there has been a transfer of care and the nursing staff should be informed by a consultant or a registrar to that effect.

A. Yes.

Q. The end of the shift, I think, was going to be, for the doctors, 4.30, 5 o'clock, or thereabouts. Dr Steen, so far as we are aware, was carrying out her clinic -- which is not on the site, but a separate site -- and that that would finish usually at about 5 o'clock.

A. Yes.

Q. And her evidence is that she has in the past, if told that there is a patient that requires it, come back from her clinic and seen a patient in the hospital before going home. At 5 o'clock, a number of things are happening. Dr Webb is there, he's examined her and he's refined the plan, if I can put it that way.

How important do you think it was at that stage before the evening shift starts for Dr Webb and Dr Steen to have a discussion to sort out exactly how Claire's

going to be managed for the evening?

A. I think that was very important. I think that they should have spoken and agreed a plan and not attempted to do it by telephone. I don't think they even did it by telephone, but I think they needed to talk.

Q. Yes. Dr Steen's evidence has been that she did make contact with the ward and what she was told, which she cannot remember in fairness to her, but whatever it was gave her comfort. She certainly knew that Dr Webb was involved and that gave her sufficient comfort that she did not feel she needed to come back to see Claire or discuss Claire at 5 o'clock. This is a question that was put to a number of the doctors: what, so far as you can see, is recorded over the course of that day that, if it was reported to her accurately, could have allowed her to think that matters were in hand and she didn't need to either see Claire or discuss Claire's condition with any other clinician, including Dr Webb?

A. I think it's very difficult between these doctors in the situation that they're working in. I think that she hadn't actually seen, as far as I know, the child at all.

Q. That's correct.

A. And so it does seem to me extraordinary that she shouldn't make contact with a patient who is not getting

better and who is in a -- I don't know that it was recognised as being life-threatening, but really a quite serious condition. So whether or not that was almost entirely neurological, I would have thought she should have seen ...

Q. You said "not sure it was recognised that it was life-threatening", do you think the evidence was there to reach the view that it was life-threatening?

A. I think it probably was because Claire had not responded to any of the anticonvulsants, so you were therefore left with virtually no diagnosis. Well, no diagnosis.

Q. And when there is a handover to the clinical staff, what is it that you think they should have particularly, if anything, had their attention drawn to so that they could have been keeping a watchful eye over the evening of the 22nd?

A. Well, I think they could have been informed of the fact that this child has not responded to anticonvulsants. They had three of them already and another one is to come. And they should, therefore, have been looking for further diagnoses and, in particular, hyponatraemia.

Q. At that stage, the evidence is there would have been SHOs -- there were two -- but the registrar was obviously the most senior person and that she was covering the entire Children's Hospital, which I think

was about 116 beds at that stage.

A. Yes.

Q. And the SHOs, presumably, themselves are covering a number of beds also. Given the kind of observation that you're talking about, should some thought at that stage have been given to having her admitted to intensive care?

A. Yes, and the lead certainly would come from both consultants, I would have thought, and they would have a clear idea that their proposal to attack the epilepsy had not worked and that they should be looking for something else. So I don't think it's left to the junior staff or the more senior junior staff to actually work that out themselves; they should have known that. Thus, if they were in that state, then the thought of whether this child had cerebral oedema and therefore required treatment should also have been entertained.

Q. Thank you. Then the serum sodium result, as do the phenytoin levels, come back at 11.30 that evening.

A. Yes.

Q. You've seen what Dr Stewart records. That's at 090-022-056. That's Dr Stewart's note there. You see the sodium level of 121, the phenytoin level is 23.4. Then the view as to what that might mean, if I can put it that way, is hyponatraemia. And then the notes query

the way in which that hyponatraemia may have resulted:

"Fluid overload and low-sodium fluids or SIADH."

And then it's recorded as:

"Important: query the need to increase the sodium content in the fluids."

And then:

"Discuss with the registrar."

He does discuss with the registrar and he gets certain advice in relation to that.

Before we get to what the registrar said, from what you have already said, I assume that you agree that Dr Stewart had reached a reasonable conclusion based on the material available to him.

A. Yes. He may not have realised just how late in the day he was, but he was certainly on the right line for the first time.

Q. And then as for his approach, at the first line, is that a fair enough approach?

A. Yes.

Q. Then his second line, to discuss all this with his registrar, that's a fair enough approach, is it?

A. Yes, it is.

Q. I think that Dr Webb, Dr Scott-Jupp, Dr MacFaul and you have all agreed that a consultant ought really to have been involved in that stage?

A. Certainly.

Q. You make a comment at 232-002-011 -- it's (vii) at (c). There you say yes. What I want to ask you about is your comment at (b). You say:

"I would have expected the registrar/consultant to have acted on the assumption of cerebral oedema by restricting fluid intake to two-thirds of normal requirements to avoid further fluid/water overload, which might contribute to cerebral oedema, by inducing diuresis and ventilating her to reduce her partial pressure ... and to reduce the intracranial pressure ... Following the line of management of non-convulsive status was inappropriate."

What do you mean by that in terms of "following the line of management of non-convulsive status"? Because it would seem to be that the response that Dr Stewart got from the registrar, which was Dr Bartholome, was to reduce the fluids to two-thirds of their present value, to 41 ml per hour.

A. Yes.

Q. So there was a response --

A. Yes, there was.

Q. -- in relation to the sodium.

A. But I think further depressing breathing without any form of look towards ventilation was quite wrong.

Q. Just so that I understand you, is it because you think that that particular response was inadequate given the condition that Claire would have been in at that stage?
A. Yes.
Q. Is that something that you myself expected a very busy registrar who's covering the whole hospital to have worked out?
A. I think this is a situation which doesn't arise very often and in which you can get either the busy registrar, but certainly the consultants to think about and to plan action. I think a discussion between ITU and Dr Webb and Dr Steen, if Dr Steen is there. They should have actually tried to do something which would bring about, I think, ventilation of that child and, during the course of it, getting her scanned as well.
Q. So the busy registrar really should have got hold of the consultants?
A. Yes.
Q. Either or both?
A. I think ideally both, but certainly Dr Webb.
Q. Thank you.
MR GREEN: Sir, at that point may I interject? I wonder if Professor Neville could be invited to comment on the evidence on this issue of Dr Bartholome, given that he no doubt read her transcript over the weekend as he was

invited to do. It's at page 99 on the transcript for 1 November [sic]. It starts, sir, with a comment by you, the chairman:

"The other big issue ..."

Then on page 100, further evidence is given on this point, and on page 101. The point really is this that Dr Bartholome seems to have been operating under huge systemic disadvantages and I wondered if Ms Anyadike-Danes was going to take the professor on to commenting, if he can, about whether that mollifies any criticism he would otherwise have of her.

A. Do you want to take me through that or ...?

MS ANYADIKE-DANES: I'm not sure that you've been invited to criticise -- your view was that the consultant --

THE CHAIRMAN: Sorry, let's be clear. I understand Mr Green's intervention because the effect of what Professor Neville said was somewhat critical of Dr Bartholome.

MR GREEN: Absolutely. He doesn't have to use the words "I'm criticising her" for that to be plain.

THE CHAIRMAN: That's unavoidable, but the effect of your evidence was to be somewhat critical of the fact that, at the very least, at 11.30 neither consultant was informed -- appears to have been informed -- by Dr Bartholome of the stage which had been reached,

partly because -- this is important -- if Claire was to be moved into intensive care, that would normally be consultant led, and a consultant, either Dr Webb or Dr Steen, would have had more pull, as I understand it, in getting Claire into intensive care than a registrar or a house officer.

A. Yes.

THE CHAIRMAN: But the criticism, which I picked up from your evidence and Mr Green did too, was that there is some level of criticism which can be made against Dr Bartholome for the fact that, at around about 11.30, she did not make sure that the consultants were called.

A. I think that's ... But I think they should have been.

THE CHAIRMAN: Yes. And I think what you're now being asked to put into the equation is to advise us on how relevant and to what extent any criticism is diluted by recognition of the pressure which Dr Bartholome was under because of what appears to be a rather ridiculous position that she was the senior paediatric doctor on duty through the Children's Hospital that night, covering in excess of 100 patients and Accident & Emergency.

A. Yes. It seems as though you may have a situation in which you can't really adequately run that hospital at night in that situation. But this child would have

been, I think, close to the top of the list as somebody who, if they didn't take action fast, would have succumbed.

THE CHAIRMAN: Yes. I guess a point might be, and I think this was raised in the earlier evidence, that we don't know and we can't be sure, without going through all the records -- which we're not going to do -- what Dr Bartholome was actually doing at this time, whether she was with a child who was even higher on the list of priorities --

A. Yes, sure.

THE CHAIRMAN: -- and it would be fair to factor that in as an important point when considering the extent, if any, to which Dr Bartholome might be criticised.

A. Yes. Though I actually think a phone call to Dr Steen would be -- or Dr Webb would be perfectly ... It wouldn't take long, would it? Or even ask somebody else to do it and pick up the phone.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: I think the transcript will show that Dr Bartholome concedes that, with hindsight, she should have been much quicker in calling a consultant. That's not the point that was being put to you. The point that was being put to you is as you've had it and you have answered it.

Can I be clear then what you're saying, because I think you've intimated it to the chairman, as to whether Claire should have been transferred to paediatric intensive care some time shortly after that sodium result was received?

A. Yes.

Q. If she was, what difference do you think this might have made? I appreciate it's all speculation, but apart from the ability to apply ventilation, what is the difference that the treatment in paediatric intensive care could have made to her condition as you understood it to be at that time?

A. A combination of ventilation, diuresis and careful management of the hyponatraemia. That would be just two hours or so before the final event, really.

Q. I suppose that given the staffing difficulties that they had, in intensive care she could have had more one-to-one nursing or greater attention, if I can put it that way.

A. Yes.

THE CHAIRMAN: Sorry to interrupt. Professor, can I take it that the staffing level, which we've been informed about, means not only that Claire was suffering from a lack of attention but almost certainly so were other children, if you've only got one registrar covering more

than 100 patients plus A&E?

A. That looks pretty obvious, really.

THE CHAIRMAN: It's not just one child who's vulnerable to suffer?

A. No.

MS ANYADIKE-DANES: Thank you.

The actual response was for a two-thirds restriction. Bearing in mind Dr Bartholome's level of expertise and the pressures on her to deal with other children, some of whom could also have been very ill, apart from asking somebody to get hold of the consultant if she wasn't able to do that, is there anything else that she herself could have asked to have instituted while they were getting hold of the consultant to take the consultant's views?

A. Diuresis.

Q. That could have been done then and there?

A. Yes.

Q. Would it have been reasonable to have increased the concentration of sodium, so change the type of fluid?

A. That would have been reasonable, yes. So that could go at least to half strength or to full strength, 0.9 per cent --

Q. Thank you.

A. -- sodium.

Q. Bearing in mind what the chairman has said about what the staffing levels imply, if you had the kind of staffing levels that you would think ought to have been present in a hospital of that sort over the night, would you have expected Claire to have been examined at some stage after 11.30?

A. Yes.

Q. And if she couldn't be because of a shortage of staff, is that a further staffing problem, so far as you're concerned?

A. Yes.

Q. Because she should have been?

A. Yes.

MS ANYADIKE-DANES: Mr Chairman, Professor Young has provided two reports where he deals with the literature, and that bears particularly on this question of the appropriate fluid response and what would have been known at that time. He also has provided a second report, which deals with Glasgow Coma Scale. I'm very conscious that Professor Neville has not had very much time, if any really, to consider those two reports, both of which come with a significant amount of articles and materials attached to them. Given the time, I'm wondering if the preferable way to do that would be to invite Professor Neville to respond in writing to those

two reports and then we can move on to matters that he will have had an opportunity to consider.

THE CHAIRMAN: You haven't had a chance to see these reports, professor?

A. I've read the reports, I haven't read the background to it, so I can comment briefly, but that may not be ...

THE CHAIRMAN: It's less than perfect.

A. Yes.

THE CHAIRMAN: In that event, we'll leave those to be picked up either in writing or perhaps by video link with Professor Neville. Okay?

MS ANYADIKE-DANES: Yes. Mr Chairman, I wasn't suggesting writing in exclusion to video link; I just meant at another time.

THE CHAIRMAN: Yes.

MS ANYADIKE-DANES: Thank you.

I'm going to move on to discussions with Claire's family, if I may. One sees the evidence of this from a number of sources, but the one that's in her medical notes and records is the relative counselling record, which is to be found at 090-028-088. Dr Steen and Dr Webb are both identified there. You can see that the explanation that's being given under "explanation", is that:

"Claire had trouble with her breathing and needed to

have ventilatory support now."

And:

"Following the CT scan, Dr Steen and Dr Webb explained that Claire had swelling of the brain and could possibly be brain-dead."

And then down on the right-hand side, you see an evaluation of further explanation of what was provided to the parents, that:

"[Her] brain had swollen ... that a CT scan and brainstem tests showed that Claire's brain had died and only the ventilation was keeping her heartbeating [and so on]."

If we focus on the first part of it, which is that Claire had trouble with her breathing and needed to have ventilatory support. That follows on from her respiratory arrest --

A. Yes, it did.

Q. -- which happened at about 2.30 and then she's transferred at about 3 o'clock or thereabouts to intensive care. I think you have said that the cerebral oedema caused or aggravated by hyponatraemia should have been explained to the parents. I'm not pulling it up, but it's 232-002-013. Dr Scott-Jupp takes a slightly different view. He considers that:

"... the discussion with the parents were

appropriate given the information available and the clinicians' views at the time."

Again, not to be pulled up, but that's 234-002-010.

But on that first part of the respiratory arrest, do you think that the parents were accurately, so far as you are concerned, informed about her condition that gave rise to the respiratory arrest or were even informed adequately about the respiratory arrest?

A. A respiratory arrest is just a single event, isn't it, so I expect they understood that.

Q. Yes.

A. And I think they, as far as I can see, probably didn't have the run-up to it of cerebral oedema; that came rather later in the discussion. So yes, I think it's ... I don't know quite what more one can say, really, in that situation.

Q. If one looks at what happens after the CT scan, it says that:

"Dr Steen and Dr Webb explained that Claire had swelling of the brain and could possibly be brain-dead."

A. Yes.

Q. What else do you think could or should have been explained to them on the basis of the information that was available to the clinicians at the time?

A. Well, if they didn't understand this, then they should

have understood that this was a thing that uncommonly occurs in children with neurological disease and that some of the children are sensitive to having hypotonic fluids and that this was a risk almost whatever had caused the primary problem, so they would be being given two sets of risks. I don't know the parents, so I don't know what level of understanding of this situation they would have, but I would expect them to be able to cope with those two aspects.

THE CHAIRMAN: Isn't the problem about coping with anything in this scenario, professor, the fact that the parents appear not to have been given any forewarning of the seriousness of Claire's condition?

A. No, I mean it's ... And I think that's primarily because they were led along the line of status epilepticus, and that was something that they were told to the best of my knowledge.

MS ANYADIKE-DANES: On that line, when at 11.30 or thereabouts you think that the consultants might have been advised because it ought to have been appreciated that this was actually quite serious, do you think the family ought to have been told to come back?

A. Yes, they should have come back and said, "Look, this is a completely different situation and we're very sorry about this, but there is a significant issue over the

electrolytes and we need to, in a way, somewhat change course".

Q. One of the things that Mr Roberts in particular had asked and wanted to know was whether there was anything that could be done when he was told that the problem was that there was a collection of fluid and the brain was swelling as a result. He had wondered whether there was anything that could be done, whether it could be drained off in some way or anything of that sort. So far as you're concerned, what is the answer to that, that he might have been told at the time?

A. If this is at the stage at which the child has fixed dilated pupils and no response, then it really is too late. If it's done rather earlier, of course you can ventilate, of course you can give a diuretic and you can change the fluids. It is theoretically possible also to decompress the head. It's a difficult and not at all terribly safe procedure, but it has been done on a number of occasions.

THE CHAIRMAN: The answer, professor, that Mr Roberts would have got at 11.30, if he had asked that question, would have been quite different from the answer he got at 4 am?

A. Exactly, yes.

THE CHAIRMAN: So not only should he and his wife have been

informed at 11.30 and been brought back in, but that would almost have inevitably led on to Claire going into intensive care and an effort being made to do what was then done too late?

A. Yes.

MS ANYADIKE-DANES: Thank you.

Then the brainstem tests were carried out and the form is 090-045-148. You see the reference at 1(c):

"Could other drugs affecting ventilation or level of consciousness be responsible for the patient's condition?"

And the answer on both occasions is "no", whether it's at 6 o'clock on the Wednesday morning or 6.25 on the Wednesday evening. Given the medication that was administered to Claire and the length of time that that might have been in her system, leaving aside the phenytoin, though, would it have been appropriate to recognise the potential effects of midazolam?

A. The midazolam was stopped when exactly?

Q. It's not entirely clear. It's possible that it was stopped either just before she was transferred to paediatric intensive care or when she arrived there.

A. So she'd be sort of --

Q. So that's about 3 o'clock.

A. About 3 o'clock in the morning?

Q. Yes.
A. And this is done at 6 am?
Q. Yes.
A. I think that the midazolam level would be really quite low then. So that's probably okay.
Q. Is there any test that should have been carried out to satisfy themselves that she didn't have any of that in her system, if I can put it that way?
A. She could have had a midazolam level. You're going to repeat it again, so I think ... And that's going to be 12 hours later, isn't it? So I think it's a reasonable level of certainty of ... So I think ... And there's no real reason for believing that she was not excreting substances.
Q. When you say "excreting", does that depend on whether she's actually passing urine?
A. Yes.
Q. Given the amount of anticonvulsant therapy that she had been on -- she had diazepam, phenytoin, sodium valproate, midazolam and so forth -- I think her phenytoin levels were checked, and they were within the normal range. But just so that we're clear, before you even embark on the first brainstem test in order to be able to answer 1(c), should any blood tests have been done to ensure that her system no longer had the

presence -- at a significant or at the relevant level, if I can put it that way -- of anticonvulsant therapy?

A. I suppose you could have done. It's just three hours later and then much later makes it really very unlikely.

Q. I'm not so much talking about what the test was on the second occasion; I'm talking about the appropriateness of starting it in the first place at 6 o'clock without such --

A. I think that could have been done, yes. I hadn't picked that up.

Q. What could have been done?

A. The midazolam.

Q. A blood test?

A. Yes.

Q. Given that you hadn't picked it up, is it a sort of a counsel of perfection or would it have been an appropriate thing to have done?

A. I think if you were going to be repeating the thing, I think it probably is a counsel of ... I think it's not ... I don't think it's terribly important.

Q. In terms of 1(f):

"Could the patient's condition be due to a metabolic/endocrine disorder?"

And that's answered "no" on both occasions. Given your concerns about hyponatraemia, I think even Dr Webb

might have identified that. Was that appropriate to answer that "no" in both cases?

A. Yes, I think it was.

Q. It was appropriate?

A. Yes, it was. I think they mean something different by these designations.

Q. I understand that. Does that mean therefore because the serum sodium levels had come within close to normal parameters, that that was appropriate?

A. Yes.

Q. Thank you.

Then if I can deal with the brain-only autopsy. I think in your report at 232-002-014 -- not to be pulled up -- you say that you would have expected a full post-mortem as the death was unexplained.

A. Yes.

Q. In other words, you mean reported to the coroner?

A. Yes.

Q. Is there any doubt in your mind about that?

A. No.

Q. Even if you accept what Dr Webb thought at the time, which was he believed that the cerebral oedema was due to hyponatraemia, which was due to SIADH, albeit the source of that wasn't known -- and that's in his witness statement 138/1, page 47 at (c). So if that's his

position, does that lead you or should that have led him to reporting that to the coroner?

A. I think so. He doesn't really know the cause of the primary problem. The fact that we don't even know it now is something we find out later.

Q. Yes. It's Dr Steen who deals with the advice and guidance to the family, as I understand from the family's evidence, about the brain-only and not reporting it to the coroner and it is she who provides the autopsy request form that is brain-only. Would you, as the paediatric neuroconsultant who had been involved in the child's treatment, have expected to have been part of that discussion as to what sort of autopsy should be carried out and, for that matter, what should be told to the pathologist?

A. Yes, certainly.

Q. You said that very firmly.

A. Yes.

Q. Can you think of a -- I won't pursue that.

A. No reason why not.

THE CHAIRMAN: You're now finishing questions you're not being asked!

MS ANYADIKE-DANES: I think it was a comment, Mr Chairman, which isn't appropriate for me to make.

THE CHAIRMAN: Sorry, I think the point is that Dr Steen

says that Dr Webb was part of the discussion and Dr Webb indicates that he wasn't really part of the discussion. But in your eyes, if he wasn't part of the discussion, he certainly should have been part of the discussion.

A. Yes.

THE CHAIRMAN: Thank you.

A. Yes.

MS ANYADIKE-DANES: We have tried to pull together a schedule for the cause of death, trying to show people's different views on it. It can be seen at 310-009-001. You see Professor Harding's formulation. He thought the cause of death was cerebral oedema caused by hyponatraemia. He saw no evidence of meningitis, encephalitis and cerebral malformation.

He's approaching it as a pathologist, so if we leave the evidence, because he's looking at the histological slides to form that view, but if we stay with the cerebral oedema caused by hyponatraemia, would you agree with that?

A. Yes, I would.

Q. You can see the reasoning on the right-hand side. I'm conscious of the time, so I'm not reading through what the reasoning is, but you have it there as to why he thinks that.

A. Yes.

Q. And then Dr Gupta, who's the PSNI's expert in paediatric neurology, he also considers that it's cerebral oedema caused by hyponatraemia. He sees no evidence of status epilepticus. And he is of your area of expertise, if I can put it that way. Would you agree with him?
A. Yes. I mean, in that there was no evidence that related to epilepsy on the ...
Q. If one looks at his reasoning, it appears very close to that which you have already given today --
A. Yes.
Q. -- which is how that hyponatraemia might have started, if I can put it that way, and then been allowed to continue.
A. Sure.
Q. If we go over the page, we see Dewi Evans. He's the PSNI expert in paediatrics. He says it's cerebral oedema caused by hyponatraemia and caused by SIADH. So he's added an SIADH limb to how you could have got to the cerebral oedema. Would you necessarily disagree with that?
A. No, that's ...
Q. A reasonable formulation?
A. Yes, entirely.
Q. Then you can see his reasoning:

"The progression of it was a failure to prescribe the appropriate fluid and to take adequate measures to monitor the sodium balance."

Which seems to echo much of what you have said, both today and on Thursday.

Then there's Dr Waney Squier, who's the expert in neuropathology. We'll maybe move on as the neuropathologists are perhaps less relevant to your view because they are looking at the evidence after the fact and I am asking you your thoughts based on the evidence as it would have presented itself to the treating clinicians, if I can put it that way.

Perhaps if we go over the page. Then you see Dr Scott-Jupp. He's the inquiry expert in paediatrics. He has a different formulation:

"Cerebral oedema caused by encephalitis, meningitis, encephalopathy."

He also thinks that hyponatraemia might have caused the cerebral oedema and that the encephalitis might have made the brain more susceptible to the effects of the hyponatraemia. So he has those two linked in that way, but nonetheless he does have encephalitis, meningitis, encephalopathy. How do you respond to that?

A. I think that's a reasonable notion of what might have occurred, and so I wouldn't ... I think that it's ...

I would see hyponatraemia as being first line, really, so that hyponatraemia as a specific cause of cerebral oedema ... And the other things would be secondary causes of that.

Q. And are they secondary causes because we're talking about the time when Claire was alive and people were forming their views as to how she might have been treated? Are those other matters secondary causes simply because they haven't been able to be excluded, if I can put it that way?

A. Yes.

Q. If we go over the page again. That is your formulation there:

"Cerebral oedema caused by encephalopathy/hyponatraemia related to SIADH."

A. Yes.

Q. And the expert in microbiology:

"Cerebral oedema caused by viral encephalitis. Possible that the hyponatraemia caused or contributed to the cerebral oedema. SIADH is a well-recognised complication of encephalitis."

So he has an interaction as well, and do you make much the same comment as you made to --

A. Yes, I think so. I would tend to put hyponatraemia higher on the list, but yes.

Q. And finally, the next page. That is his reasoning there. And I don't think we need to go further on because Caren Landes, for example, is an expert in radiology. Unless someone thinks there's a particular expert we've left out.

We did produce the earlier schedule I was trying to take you to, which showed what the clinicians at the time thought, so you can look at their formulations. It's 310-019-001. You see Dr Steen. She has meningoencephalitis causing the SIADH, leading to the hyponatraemia. She also has status epilepticus. That was her first formulation, but after the inquest she accepted the verdict of Professor Young, which we're going to go to in a minute.

The reason for that is when she gave her evidence, her view was that she thought that the hyponatraemia was the result of these other interactions as opposed to the cause. And I think your view is that you put the emphasis the other way round, or correct me if I'm wrong.

A. Yes. That's right.

Q. And then if we go to the next page, those are the paediatricians, so this formulation has them all in discipline, if I can put it that way. The next page, there's Dr Webb. His formulation was:

"Meningoencephalitis causing SIADH leading to hyponatraemia."

So his was very similar to Dr Steen.

Then if we just go to page 5. Let's see. I'm trying to get to Professor Young.

THE CHAIRMAN: Page 4.

MS ANYADIKE-DANES: There we are, page 4.

Professor Young. This is the formulation that Dr Steen accepts:

"Hyponatraemia due to excess ADH production and also meningoencephalitis and status epilepticus."

That's his formulation.

A. Prior to ...

Q. I beg your pardon?

A. Yes. Well, as it happens, the meningoencephalitis is not well defended, really, is it?

Q. Yes.

A. And status epilepticus is rather poorly defended.

Q. Yes.

A. So the hyponatraemia and, obviously, brain swelling he has put down as the major issue. That's it, I think.

Q. Then I just have a few more questions to you from others.

Firstly, Claire's parents were made aware of a viral illness with some sort of internal fitting. So far as

you are concerned, was that a sufficient explanation of what was wrong with their daughter?

A. Not really, no, not in ... I think the seizure activity was never clear, except for that which was related to the hyponatraemia. She may have been fitting, but we just don't know.

Q. And who should have been responsible for making sure, throughout her admission, if I can put it that way, until her collapse, that the parents understood what people thought was wrong with Claire and how seriously ill they thought she was? Who had that responsibility?

A. Well, it's a combination of the consultant and their junior staff, backed up by nurses.

Q. Well, Dr Webb examined Claire at 5 o'clock with her parents being there. Is it his responsibility at that stage to make sure that they understand how seriously ill their daughter is?

A. Yes. There are mentions --

Q. Just the mother, I beg your pardon. Only Mrs Roberts was present, sorry, not both parents.

A. I think there are conventions about these matters and sometimes the visiting consultant will give the information. On other occasions when he's got the other consultant with him, he would sort of defer. They'd talk and then one probably would come back and explain.

So it could be either way round.

Q. If he was concerned about doing that because he didn't regard Claire as his patient, would that be another reason for him to contact Dr Steen and make sure that she is giving that information to the parents of her patient?

A. Yes, sure.

Q. It's a big question, but at what stage do you think appropriate intervention could have saved Claire?

A. You might have got away with it at the later stage of 11.30 at night on the 22nd. I'm not sure because she was just about to cone. Certainly, I think on the morning round on the 22nd, there was plenty of time to move in and start to correct things.

Q. At 5 o'clock?

A. Yes. Between the two. But I think, yes, that would have been possible as well.

Q. And at 11.30, if I understand you, that would have required quite urgent and extreme measures --

A. Yes.

Q. -- perhaps of the sort that really could only be expected that a consultant might have instituted?

A. Yes, yes, absolutely.

Q. Or even known to institute?

A. Yes.

Q. And then, subject to anyone else asking something, there's one final question, which is whether there is any suggestion to the osmolality result of 249 at 3 am. We can see that at 090-022-057.

A. When was that?

THE CHAIRMAN: 3 am on the Wednesday morning.

MS ANYADIKE-DANES: Yes. Do you see that result there?

A. Yes.

Q. In the context of the sodium result of 121. Five lines above the Na, 121.

A. Yes.

Q. What is the significance of that?

A. I think you're getting really quite late in the argument about this. I'm a bit unsure what to make of that, that result.

Q. It's normally 285; is that right?

A. Yes, it's plainly low for what is normally a ... But I'm not sure that a single osmolality done at that stage is going to tell you an awful lot.

Q. I understand.

THE CHAIRMAN: Okay. We have to let the professor go.

I think we'll sort out, over the next day or two, professor, how to tidy up the last bit of your evidence in light of the new information which has come through, which you haven't had a chance to look at. If at all

possible, we'll consider the two options of a video link or a short written note from you. We'll need to tidy that up as soon as possible.

Is there nothing else for the professor before he goes?

MS ANYADIKE-DANES: No. Mr Chairman, I wonder if you'd give me leave to discuss how one deals with this evidence, given that he's still on oath.

THE CHAIRMAN: Is there any objection to that? No.

We'll have to resume a bit early. We'll resume at 1.45. Thank you.

(1.05 pm)

(The Short Adjournment)

(1.45 pm)

DR JOANNE HUGHES (called)

Questions from MR REID

MR REID: If I can call Dr Joanne Hughes, please.

THE CHAIRMAN: Can I start by apologising to you? I think we've messed you about a few times before on when exactly you give your evidence. I am grateful for you coming up today.

A. No problem.

MR REID: Thank you, doctor. I think you are quite softly spoken, so if you wouldn't mind speaking into the microphone whenever you answer the questions.

You have made one witness statement to the inquiry, WS140/1, dated 9 January 2012; is that correct?

A. That's correct.

Q. Would you like to adopt that statement as your evidence before the inquiry?

A. Yes.

Q. Thank you. If I can bring up your curriculum vitae at 311/016-002, please. If we turn over the page to page 003, please. This is your current employment. You're currently a consultant paediatrician with an interest in inherited metabolic disorders at the Children's University Hospital, Temple Street in Dublin; is that correct?

A. That's correct.

Q. You have been a consultant paediatrician since February 2008, previously in the Children's Hospital?

A. That's correct.

Q. So you have now been a consultant paediatrician for four-and-a-half years; is that correct?

A. Yes, that's correct.

Q. Would I be correct in saying that you qualified as a doctor from Queen's University Belfast in July 1992?

A. Yes.

Q. And you were a junior house officer for a year, a

general senior house officer for two years, and then you were a paediatric senior house officer in Antrim Area Hospital for a year.

A. Yes, that's correct.

Q. In August 1996, you went to the Royal as a paediatric senior house officer; is that right?

A. That's correct.

Q. And you were in A&E for the first two months, but you were on Musgrave Ward from the start of October on.

A. That's right.

Q. By that stage, you had been in paediatric medicine for just over a year.

A. Just over one year, that's right.

Q. First of all, in October 1996, did you have any awareness of the dangers of hyponatraemia?

A. I was aware of hyponatraemia as an entity and aware that it could cause problems with cerebral oedema. I'm not sure if I was aware that it could occur so acutely, but I was aware of hyponatraemia as an entity.

Q. And where did you get that awareness from?

A. I'm sure we would have learned that throughout university and then, in general, dealing with patients, we would be aware that sodium balance was very important.

Q. Would you have been aware specifically of the 1992

Arieff article, for example?
A. No, I don't think I would have been aware of that article in particular.
Q. Did you have any awareness in October 1996 of the Adam Strain case or inquest?
A. I don't think I did, to the best of my recollection I think I heard about that much later.
Q. And you were in Musgrave Ward. Was that a ward in which there was some paediatric nephrology and so on; is that correct?
A. That's correct.
Q. Did you have any dealings with Dr Maurice Savage, now Professor Savage?
A. Yes, in that he was based on the same ward. I wasn't attached to the renal team during that attachment; I was part of the general Musgrave Ward team, but I would have obviously worked very closely with Professor Savage, yes.
Q. Do you recall having any conversations with him at any time about the Adam Strain case?
A. I don't recall any.
Q. If I can bring up your rota for October 1996. It's at 302-031-003, please. There we see on Tuesday, 22 October, you are the medical SHO between 5 and 10 pm to be followed by Dr Stewart doing night cover, between

10 pm and 9 am; is that right?
A. That's correct.
Q. And there was also a surgical SHO on between 5 and 10 pm.
A. That's correct.
Q. Would you have been then the only senior house officer covering the medical area?
A. Yes, that's correct. There would be one senior house officer covering all of the medical patients and one covering all of the surgical patients until 10 pm.
Q. So would it be correct to say that between 5 pm and 10 pm, there would have been a medical SHO, a surgical SHO and an A&E SHO on duty at the Children's Hospital?
A. Yes. I can't remember how many SHOs. There may have been more than one, but yes, that's correct.
Q. And you would then have covered all the wards?
A. We would have covered all of the medical patients on the ward. So that would have been all the patients in Allen Ward, Musgrave Ward, Belvoir Ward and any other outlying medical patients throughout the hospital.
Q. First of all, do you recall any of the events of 22 October?
A. I don't, unfortunately, no. I have no recollection of that evening.
Q. Would it be correct to say that anything you can answer

is your piecing together of information from the notes and your general knowledge of what things were like at the time?

A. That's correct.

Q. In terms of that, how many patients would you be typically looking after during that medical shift from 5 pm to 10 pm?

A. Probably maybe between 40 and 50. There would have been -- I can't remember how many beds there would have been in Musgrave Ward and in Allen Ward. And then of course you would have the infectious diseases ward, Belvoir Ward, as well to cover. And then -- so it would maybe between 40 and 50 patients. I'm not sure exactly. And obviously your duties would also involve admitting any patients from A&E.

Q. Sorry, I missed that last sentence, and obviously your duties would also involve?

A. Admitting patients from A&E.

Q. We've heard from, I think, Dr Bartholome. She was the registrar on call for the evening of the 22nd into the 23rd. She says there may have been up to 120 patients under her care during that night. You're saying 40 to 50.

A. You asked me specifically about medical patients. The Children's Hospital also had surgical patients and

neurology patients, cardiology patients, haematology patients and ICU, so --

THE CHAIRMAN: So Dr Bartholome covered everything --

A. The registrar covered all the medical patients in the hospital, yes.

THE CHAIRMAN: Right. Is she also then covering the other areas you mentioned?

A. Yes.

MR REID: Would it be fair to say that both Dr Bartholome and Dr Stewart, as the SHO on call, are covering a larger number of patients than you covered between 5 and 10.

A. Yes, that would be entirely right.

Q. Is it almost like a step down in that there's the day shift, which is the most intensive covering of staff and then there's the 5 to 10 pm slot, when there are fewer staff, and then there's the overnight slot of 10 until 9 am where there's the least number of staff?

A. That's correct. There's a lot of admissions in Children's Hospital, particularly in the evening time, after teatime, so for that reason there would be two SHOs covering: one covering the medical admissions, one covering the surgical admissions.

Q. Sorry, you're talking quite softly and very fast.

THE CHAIRMAN: You said there were a lot of admissions

in the Children's Hospital, particularly in the evening time after teatime?

A. Yes. So there would be two SHOs: one to cover the medical admissions, and one to cover the surgical admissions. Then after 10 o'clock, that tended to ease off. Sometimes, not always. Sometimes there would be one SHO on after 10 o'clock, who would be covering a significant number of medical and surgical admissions as well as the patients who were already in the hospital.

MR REID: If I can just bring up your witness statement, 140/1, at page 2, question 2. You say there that one the 21st you would have worked a normal 9-to-5 day and then on the 22nd, you did a 9-to-5 day in Musgrave Ward, and then from 5 pm to 10 pm you were on call for medical patients throughout the hospital and again the next day you were on 9 to 5.

A. Yes. That's correct.

Q. During that 5 to 10 pm slot, the only registrar available to you would have been Dr Bartholome; is that right?

A. That's correct.

Q. If I can just turn over the page to page 3. At question 4(b) you say:

"During the period of on call, 5 to 10 pm, on

22 October, I would take bloods and administer medication if necessary. I would see patients if asked to do so by nursing staff and inform my senior colleagues if there were any concerns."

Is that right?

A. That's correct.

Q. Would it be fair to say that your duties during that period are slightly different from your normal day duties, 9 to 5?

A. Yes. During that period you really are -- well, you're admitting any patients from A&E and you're really responding to any concerns from the staff who are continually looking after patients. You might also have a list of duties to complete from the handover at 5 o'clock. So you have a list of things to do.

Q. Is it twofold, number one, a reactive role to any admissions and any problems that result?

A. Yes.

Q. And the second thing, that you have certain duties that have to be carried out, tests, medications et cetera?

A. Yes, that's a good way of putting it.

THE CHAIRMAN: Was Dr Volprecht overnight the night before?

A. That's correct.

THE CHAIRMAN: So she wasn't your equivalent the night before.

A. No.

THE CHAIRMAN: Thank you.

MR REID: You say there you would see patients if asked to do so by nursing staff.

A. That's correct.

Q. Would it only be nursing staff or would it also be medical staff and so on as well?

A. Well, the only other medical -- sometimes the registrar might ask you to see a patient, but mainly it would be the nursing staff who would raise concerns if there were any.

Q. And when you say you would inform your senior colleagues if there were any concerns, what do you mean by "senior colleagues"?

A. The registrar in the first instance.

Q. And if you were unable to contact your registrar?

A. I don't think there has ever been an instance where you are unable to contact the registrar.

Q. In what circumstances would you have considered at that time that you should contact your registrar?

A. In relation to this specific case or in general?

Q. In general.

A. I always felt very supported in Children's Hospital. It's quite a tight-run unit and, really, if there was anything that you were worried about at all,

particularly in a patient who you weren't familiar with, you would discuss it with the reg and usually what we would do in the evening before finishing, if there was time, would be to do a ward round where we walk around the wards in the hospital and check if there's any concerns or any jobs that need to be done. So there was always an opportunity to speak with the reg if you were worried.

Q. Two things just to pick up from that. First of all, you said "particularly in a patient you weren't familiar with".

A. Mm-hm.

Q. You wouldn't have generally been familiar with the patients who weren't on Musgrave Ward during the day; is that right?

A. That's correct.

Q. Secondly, you said you might have been able, at some point, to do a ward round --

A. Yes.

Q. -- so to speak. Would that ward round be of a different nature to the morning ward round?

A. Yes. Maybe "ward round" is a bad choice of words. Maybe a "walk around" would be a better way of describing it. We would have tried to walk round in the evening and tidy up whatever jobs needed to be done on

the wards. And the nurses would know to gather things up that weren't urgent for you to complete when you came round.

THE CHAIRMAN: Who would you be doing with this, nurses or with the registrar or --

A. You would try and do it with the registrar. Whether that was -- I can't quite remember if that was before 10 o'clock or after 10 o'clock, but at some point in the evening ... Particularly Dr Bartholome was very good at doing that. You would try to have a walk round and make sure all the jobs were done and that you were aware of any problems.

MR REID: And what would you seek to achieve on this walk round?

A. Really to be sure that you were aware of any concerns or any potential concerns and also to ensure that you had done whatever jobs needed done, such as bloods, fluids prescribed, kardexes written up. That sort of thing.

Q. How would you gather the information that something needed to be done? Would it be from the nurses who were present, for example?

A. Yes.

Q. Might it also be from information you gained on the handover from the day SHO?

A. Yes. Primarily your first port of call on taking over

in the evening would be a handover. Now, it was a very informal handover, it's not formalised or it is formalised now. But that would involve a brief discussion about whichever patients are causing concern and a list of duties that needed to be done, such as bloods or fluids or antibiotics.

Q. Would you also look at the notes to see if anything was outstanding or needed to be done?

A. No, because that would involve -- really, you would be told about the patients that needed something done rather than having to go and look through all of the notes.

Q. You wouldn't have had time to look at each patient's medical notes?

A. No, and it wouldn't have been relevant in a lot of cases either, you know.

THE CHAIRMAN: The list of outstanding things to be done -- for instance, if Dr Stevenson is handing over to you, would you be writing down what he was saying to you?

A. Yes, you would generally have a list of jobs to be done in your hand, in your pocket, that list would grow as the night goes on and people call you and things get changed and moved around and prioritised as necessary. That's how it works. You have a list of duties to be done and you prioritise them as you see fit.

MR REID: For example, would you be told, say, that acyclovir needs to be administered at 9.30 pm, and you would write that down?

A. Yes.

Q. So you would know at 9.30 you have to come back to the patient and administer acyclovir?

A. Yes.

Q. Would other SHOs ever hand over their to-do list just simply to you?

A. Occasionally. The majority of people would stay on the ward to try and get as many jobs done as possible, and very few people ever left at 5 o'clock. Within reason, you know -- I think I administered an antibiotic at 5.30, and that's a reasonable thing to do. Within reason, you might hand over a few outstanding jobs from the daytime, but usually you would try and clear them up yourself.

Q. You have said briefly about the handover. You said it was pretty informal, but there would be a brief discussion about patients of concern and what duties needed to be done.

A. Yes.

Q. You don't recall any handover from Dr Stevenson that night.

A. I don't, unfortunately.

Q. At that time, was the usual practice for all the SHOs to gather up and speak to you together or do you go around speaking to each one individually?
A. I can't really remember, to be honest with you. I think the main person to get handover from would have been the Allen Ward staff because in Children's Hospital there were two teams. So there was the Allen Ward team and the Musgrave Ward team. So the main person to get a handover from would have been the Allen Ward SHO.
Q. Why in particular Allen Ward? Is it that the patients who have just come from A&E go to Allen Ward?
A. No, because I worked on Musgrave Ward, so I would have known those patients.
Q. I see. Why Allen Ward in preference to the other wards other than Musgrave Ward?
A. Because we worked in teams, so there was an Allen Ward team, and a Musgrave Ward team, so all of the Allen Ward team patients may not have necessarily been in Allen Ward, but the Allen Ward team would have known of them. So there may be some patients in Belvoir Ward who were under the care of either the Allen Ward team or the Musgrave Ward team. I would have known about the Musgrave Ward team patients and I would need to be informed about the Allen Ward team patients.
Q. If I can bring up an answer that Dr Stewart gave in his

witness statement. It's WS141/2, page 2, please.

Question 1(a):

"Normally, the retiring senior house officer gave a verbal report to their colleague coming on duty. This report covered all relevant information we would need to continue the patients' care through the night."

Obviously, I realise Dr Stewart's doing the overnight shift. He said:

"Such a report might include: the details of patients on their way for admission [where they still need to be clerked in]; information regarding current ward patients whose condition was causing particular person; important test results to check before the morning ward round; a list of outstanding tests, for example, blood tests or X-rays that had to be done; and a list of outstanding urgent test results."

Which the lab would need to be contacted about.

Does that reflect what would normally have happened in informal handovers at the time?

A. Absolutely, yes. That's a very good ...

Q. You've had an opportunity hopefully to have seen Claire's medical notes and records now.

A. Yes.

Q. Given what's in the medical notes and records, what would you have expected Dr Stevenson to have told you on

your coming on shift at around 5 o'clock?

A. I would have expected him to have told me --

Q. About Claire, obviously, is what I mean.

A. I would have expected him to have informed me that she -- first of all, she was a sick patient. There's no doubt about that, so I definitely would have been told about her in the handover. I would have expected him to have told me that Dr Webb had just seen her and prescribed medication, that she -- I again, this is an assumption. I would assume he would have told me that the working diagnosis was status epilepticus and meningoencephalitis that she was on anti-epileptic therapy.

THE CHAIRMAN: Sorry, doctor, slow down a little bit. The stenographer's going to lose track completely.

MR REID: You said prescribed medication, the sickness of Claire, and the working diagnoses.

A. Yes.

Q. Anything else?

A. And also the fact that she needed to have some blood tests and medication administered.

Q. Those blood tests would have been, what, from your reading of the notes?

A. Well, it's stated in the notes that she needed to have a phenytoin level at 9.30 following the loading dose.

I don't think it's stated in the notes -- well, I can't recall whether it is or isn't stated that she needed a U&E, but in any child who's on IV fluids, she should have her U&E checked.

Q. Would you have expected a U&E check prior to the 9.30 taking of bloods?

A. Again, in reading the notes and in looking back on it now in retrospect, I would have expected a U&E to be taken in the morning. But I'm not sure what I would have been given at handover. I presume if I was going to be taking bloods at 9.30, that would be the time to do all the bloods rather than doing a U&E at 5 pm and then phenytoin at 9.30.

Q. Can I bring up 090-022-055, please? This is Dr Webb's note at 5 o'clock. The second point of his plan, he says:

"Check viral cultures, query enterovirus, stool, urine, blood and T/S."

Would you have expected to have been told that those needed to be done?

A. The stool and the urine would be nursing duties. As a doctor, you wouldn't do that. I would have expected, I suppose, to be told that viral cultures needed to be taken.

Q. If I can move on from the handover to the drugs

prescription chart and bring up the original chart at 090-026-075. This is the original drugs prescription chart which you rewrite at 9.30; is that correct?

A. That's correct, yes.

Q. Firstly, is this sheet a pro forma that would be on every patient's file?

A. Yes.

Q. And where would it be kept? Would it be kept with the file?

A. It would be kept with the nursing file. My recollection in 1996 is that it would be kept on a clipboard at the end of the bed, as opposed to with the medical file, which kept in a trolley beside the nursing station.

Q. You think this would have been kept actually at the bedside itself?

A. I think so. Sorry, let me correct that. I really can't remember, to be honest with you. Sometimes there was a list -- a book with a list of drug kardexes in it in the treatment room, and I can't remember whether this would be at the end of the bed or in with that. I'm sorry.

Q. Although it would be useful, I presume, for it to be at the end of the bed because these are prescriptions that need to be done at different times --

A. Yes.

Q. -- and if you needed to check whether something had been done or needed to be done, it'd be quite easy to check at the end of the bed and see if it's there.
A. Yes.
Q. And would replacement sheets be present with that sheet or would you have to go off and get those from elsewhere?
A. Again, I can't quite remember, but they were readily available. I think they were in a filing cabinet at the nursing station where you just took out another kardex to complete if necessary.
Q. It's a point you touched on earlier: how do you know when physicians have to attend in order to administer medication? Is it just from the handover or is it sometimes you'll look at the kardex and say, "I need to note down that".
A. You might be told at the handover, but more regularly the nurses on the ward would bleep you and say, "We have two or three antibiotics to be given at 5.30", or whatever.
Q. So it's a dual responsibility: it is your responsibility to know from the other doctor when prescriptions need to be administered, and the nurses also need to be aware so they can remind you?
A. Yes. Generally speaking, if it was a routine

antibiotic, that wouldn't be in the handover; it would usually be the nurses would bleep you from each of the wards and say, "We have an antibiotic due at such-and-such a time".

Q. Is it correct --

THE CHAIRMAN: Sorry. So the phenytoin, as I understand it, would be an unusual drug to be administering. So that's the sort of thing you might expect Dr Stevenson to mention to you.

A. Yes.

THE CHAIRMAN: Whereas other standard drugs, like antibiotics, in essence you rely on the nurses to inform you about those.

A. Yes, the phenytoin and the acyclovir are unusual drugs and if acyclovir's just being started, I would have expected to be given that information in the handover.

MR REID: Are there usual times? We see at the top of that drugs prescription sheet the time of administration and, I think, there are eight set times, and then there's an "other times" column. When it comes to, say, 9.30 at night, do you think on the ward, "This must be a time when I need to administer medication"?

A. Yes.

Q. Just before we move on, you said about the walkabout earlier. When normally on one of those shifts would

that walkabout have happened just on a normal evening?
A. From my recollection, we would have tried to have a walkabout before 10 o'clock, before the single-handed SHO came on overnight. That didn't always happen because that's a particularly busy period, but generally speaking, if it didn't happen at that point, as a registrar you would have wanted to have a walk around at some time before midnight if possible. Again, allowing for the fact that it wasn't too busy in the evening and you could do that.
Q. Is that because, come 10 o'clock, the resources are less?
A. Yes.
Q. So you want to make sure you've covered anything that's difficult before then?
A. Yes.
Q. If I can bring up alongside the document we've got in front of us 090-026-073, please. This is your rewritten drugs prescription sheet; is that correct?
A. That's correct.
Q. That's your handwriting, "Rewritten 9.30 pm, 22 October 1996"?
A. Yes. That's correct.
Q. Do you know why you rewrote the drugs prescription chart?

A. Again, I don't have any recollection of the evening, but from reading the notes, there is an entry in the nursing notes with regards to increasing the midazolam infusion. And there's no space on that kardex to write that up, so I would have rewritten the entire kardex.

Q. So if I bring you to that nursing note, is that 090-040-141, please? This is Staff Nurse Ellison's note. It says:

"Update PM. Stat IV Hypnovel at 3.25 pm. Continuous infusion running at 2 ml per hour of Hypnovel. To be increased by 0.1 ml per five minutes up to 3 ml per hour."

Is that the reference you mean?

A. Yes, that's right.

Q. And it says "Doctor to write up" --

A. Yes.

Q. -- and then "Given stat dose. Sodium valproate at 5.15".

A. Yes.

Q. First of all, would you have had to attend -- I think we touched on it earlier -- Claire's bedside to rewrite that drugs prescription chart?

A. Not necessarily. Sometimes the drug prescription charts were on the -- at the nurses' station for you to write up.

Q. Okay. The midazolam change isn't the only change you make to the chart. If I can bring both of them up. 090-026-073 and 075, please. So whenever you're rewriting this, you transcribe the first five medications with the additional note that the midazolam is to be increased; is that right?
A. That's correct.
Q. But the sodium valproate from the earlier chart is not transcribed across and neither is the "Drugs once only prescriptions"; is that right?
A. That's correct.
Q. And can you explain just why that is, please, doctor?
A. I can't because I don't have any recollection of the day. But what I would say is that I've very deliberately crossed it out, so I would assume that I've discussed that with someone and there is a reason for that, but I don't recall what that is.
Q. We'll go into that in a minute. Another reason you've given in your witness statement is that you needed to rewrite the original prescription sheet because it was full.
A. Yes.
Q. What do you mean by that, that it was full?
A. The prescription sheet on the right?
Q. Mm-hm.

A. There's no room to -- you can't just score out the midazolam and write over the new dose. So you need to write another prescription sheet, and the nurses usually generally would prefer to work from one rather than two.

THE CHAIRMAN: Is that to avoid confusion?

A. To avoid confusion, yes.

MR REID: For example, if we bring up 090-026-076 alongside as well, please. That's the continuation of the original prescription sheet; is that right?

A. Um ... I think that's -- is that on the back of that or ...

Q. Sorry?

A. I can't remember. This is an old prescription sheet, so I'm just trying to remember what it looked like.

Q. It looks like it says "G, H, I, J, K" along the left-hand side.

A. I think these were two separate pages, one was on the front and one was on the back.

Q. One option obviously is to continue on to that second page; isn't that right?

A. I'm not sure that that is an option. I would need to see the original prescription sheet. I think this is on the back, the right-hand side is on the back of that. So I'm not sure that that is -- one is for IV and the other is for oral. So you can't write the IV

prescriptions on the ...

Q. There's a possibility we might get the originals during the break for you to have a brief look at. Whether it's on the back or whether it's attached to it, would you accept that it's a possibility that you can put it on to the second page?

A. I don't think it was a possibility that you could put it on the second page, so I think that's why I rewrote it. In my recollection of working on Allen Ward and Musgrave Ward, any time you got to the end of this sort of sixth box here, you would rewrite the prescription sheet, from my recollection.

Q. As you say, that's for the nurses, to keep them right?

A. The nurses are the ones that administer the medication, so that's the most important thing.

Q. If you were rewriting the original prescription sheet, and if we bring up 073 and 075 together --

A. Sorry, before you do that, can I just say that on the left is for intravenous drugs, parenteral drugs. So this is not oral drugs. The one on the right is oral drugs. So you can't write this prescription on the other one; does that make sense?

Q. It doesn't specify that. Do you have any --

A. Well, it does say "parenteral drugs" on the top of --

Q. Yes. So you're saying the one on the left is for IV

drugs --

A. Or IM.

Q. -- and the one on the right is for oral drugs?

A. Oral or rectal.

Q. I understand.

Can you bring up 073 and 075 again, please? Just in terms of the note you have written, "Rewritten 9.30 pm", do you think that it would have been -- you haven't written anything on the original prescription sheet to say that it was rewritten. Would that have been something that could have been useful to write so that people didn't mistake that for the current drugs prescription sheet that was in use?

A. Um ... Yes, I think usually -- because this was a small piece of paper, so usually it would be taken out, and this would be put in place of it.

THE CHAIRMAN: The one that's taken out is put where?

A. In the notes, but taken away from, you know, the prescription kardexes.

MR REID: So it's taken away from that primary position --

A. There wouldn't be two together, there would just be the one.

Q. So if a doctor's coming to see it, the one they would see first and centre is the rewritten one; is that what you're saying?

A. There should only ever be one kardex there.
Q. Why did you not transcribe across the "Drugs once only prescriptions" at the bottom?
A. Because they have been given once and once only. You don't transcribe that. It's not a continuous prescription. You would still have this prescription sheet to go back on, so you would know that the patient was started on these medications on the top and had the once-only drugs administered at the time stated on the prescription sheet. But you would know that the second one on the left is a continuation of that because it says, "rewritten". You wouldn't transcribe the once-only prescriptions because they've been given.
Q. Is it not something that's perhaps useful to be able to see the ones that have given as well?
A. No, because if you need to prescribe further drugs -- well, you can see them because this doesn't go away. You can look in the notes and look at this and see what has been given, but you can't prescribe -- basically you would be prescribing them again and I couldn't sign that I'd given them, so that's not something that you can transcribe, that's not appropriate.
Q. If we look at the "drugs once only" on the right-hand side, there is the midazolam of 120 milligrams and the phenytoin of 635 milligrams. You might have heard from

the evidence so far that both of those seem to have been erroneously calculated or noted. Did you know any of the errors on that sheet?

A. At the time?

Q. Yes.

A. I have no recollection of the evening, so I don't know.

Q. With hindsight, would you consider you maybe should have noted those errors?

A. I think I would have been unlikely to have noted them to be honest with you because I would be unlikely to go back and recalculate those doses.

Q. How familiar were you with midazolam and phenytoin in October 1996?

A. Phenytoin would have been a fairly standard line for status epilepticus in both adults and children. And I had worked in adult neurology, so I was familiar with phenytoin as a drug to use in status epilepticus.

Midazolam, I don't recollect that I had any familiarity with using midazolam in 1996.

Q. Just while we're on the rewriting of the prescription sheet, would you normally note the fact that you've rewritten the drugs prescription sheet in the clinical notes?

A. No.

Q. Why is that?

A. It's just not something that you would normally note. You write prescription sheets fairly frequently, depending on how many drugs people are on or for whatever reason, but it's not something that would generally be recorded in the clinical notes.
Q. We've looked already at the nursing note in which the midazolam is increased. Are you aware of any corresponding clinical note that relates to that?
A. I'm not.
Q. Do you know who might have directed that increase in dose?
A. From reading the note, no, I don't know who directed it, but I'm quite certain that it must have been someone more senior, because again, as I said earlier, I didn't have any experience in using midazolam at that time.
Q. So the only thing you have available to you is the nursing note and the nurse saying that the dose should be increased?
A. Yes. That wouldn't be unusual if the nurse had had a conversation either by phone or in person with someone else, someone has clearly directed in very clear terms how it should be increased and the nurse has noted that and then she has asked me to prescribe it. That's not unusual in itself.
Q. You said that the use of midazolam at the time was

unfamiliar to you; isn't that right?
A. That's correct.
Q. So you come across this patient and you've been asked to increase the dosage of a drug that's unfamiliar to you.
A. Mm-hm.
Q. And the only point you have regarding it is the nursing note. Do you not consider at that point, maybe I should check this with another doctor?
A. I don't recall the evening, so it may be that the nurse has told me that another doctor -- I'm sure another doctor has prescribed it. So if a nurse has told you that a senior colleague has prescribed it, then I wouldn't need to recheck that.
Q. Is it even to the extent that you would want to check to make sure the dosage is correct?
A. I think increasing the dose from 2 micrograms per kilogram per minute to 3 micrograms per kilogram per minute was a reasonable -- is within the prescribing guidelines of that drug, so I think that's reasonable.
Q. Yes, but at the time you were unfamiliar with midazolam.
A. Yes.
Q. Now you might be able to look at it and say that the increase from 2 to 3 is a reasonable increase, but at the time you weren't really aware of whether it was; would you accept that?

A. I would, yes.
Q. So at the time you didn't know whether that was a reasonable increase or whether it was a properly calculated increase. In those circumstances, should you not be double-checking something, whether it be the BNF or with a senior doctor?
A. I may have done that, but I don't remember the evening. It may be that the nurse has told me that someone has said to increase the dose and I may have checked that, but I can't remember.
Q. If you did check it, you haven't made a note that you checked it with anyone; would you accept that?
A. Yes.
THE CHAIRMAN: On this scenario, is it most likely that it was Dr Bartholome who had directed this?
A. I don't know. My initial reading of the note, I thought it was Dr Webb, but I don't ... When you read the note clearly, it doesn't state who has directed that increase, so I can't surmise who it might have been.
THE CHAIRMAN: Right.
MR REID: If we actually bring up Dr Bartholome's evidence. 18 October 2012, page 27. She says beginning at line 18:
"To change the dose that was received by Claire for either or one of the other [as in midazolam or

phenytoin] is a decision I would not expect a first-term SHO to make."

If we turn over to the next page, please. I asked her whether she would have expected a direction or to have contacted a senior colleague, and she said that she would have expected that to have happened, and I asked her if she would have expected that to have been noted in the medical notes themselves, the clinical notes, that the dosage was being increased and the drug sheet was being written. She says, as you did:

"I do not expect her to document that she rewrote the kardex, but I would have expected her to document in the notes that she had liaised with a more senior colleague and that the decision to increase the infusion rate had been made by whoever that was."

And I asked her if she had any comment about the fact that there was no note, and she said:

"I personally think there should have been a note and it would appear from the documentation that this was not done. It is something I would expect not only to be dated, but also to be timed."

Do you have any comment just on what Dr Bartholome has said there?

A. I agree that both increasing the midazolam and discontinuing the sodium valproate are not something

that a first term SHO would have done without senior consult. It wasn't -- in hindsight, yes, it would have been helpful to have recorded who directed that, but at the time in 1996, every conversation wasn't necessarily documented in the notes. I think we've got much better at that. So I think in 1996 if I'd been given direction that a senior colleague had asked for a prescription to be written, I would have done that and dated it and signed it in the medical kardex, as I have done.

Q. Let me ask you this: this is 9.30 at night and you're increasing the dose of the midazolam. Midazolam again is a drug you're unfamiliar with and you might have been given information on the handover that Claire was quite a sick child; would that be safe to say?

A. Yes.

Q. In those circumstances, do you think it would have been appropriate to have re-examined Claire prior to rewriting the drug kardex and increasing the dose of midazolam?

A. Yes, I think that's reasonable.

Q. First of all, do you have any evidence to say that you did examine Claire at that point?

A. Well, I was certainly with Claire at that point because I took bloods and inserted a line, from the notes.

I haven't recorded anything in the notes, but I certainly would have been with her and made an assessment of her at the time.

Q. And in being there and making an assessment at the time, what assessment would you think you would have done?

A. I would have wanted to know about her vital signs, I would have wanted to know what her blood pressure, pulse and temperature and things were, and I would have wanted to know how she had been, looking at the observation charts and things, and compare that to how she'd been earlier in the day.

Q. If you had done that assessment, would you have expected you would have documented that?

A. Usually I would have documented that, yes.

Q. Do you accept that there doesn't seem to be a note in --

A. Yes.

Q. And indeed, if we turn to page 42 of Dr Bartholome's evidence, she says at lines 5 to 9 -- I asked her a similar question, what she would have expected of you. She said:

"Seeing that she was on the ward and actually dealing with something that affected Claire, she was rewriting her kardex, so that would usually be done at the bed side or close to that. Yes, I would have expected her to have a look at Claire and examine her

and document that."

Do you accept that?

A. Yes.

Q. If you'd been there at the time, do you think that you would have looked at her central nervous system observations?

A. Yes.

Q. If I can bring those up. 090-039-137, please.

THE CHAIRMAN: Sorry, there's no doubt that you were there at the time, sure there isn't.

A. There is no doubt. I was there.

MR REID: If you'd examined and assessed her was what I meant to say.

A. Yes.

Q. If you had examined or assessed her, you would have been aware of her CNS observation chart.

A. Yes.

Q. You've got it before you now. You can see, at 9 pm, her Glasgow Coma Scale was:

"Eyes open, none. Best verbal response, incomprehensive sounds. Best motor response, flexion to pain."

That gives her an overall score of 6.

A. Yes.

Q. And that 6 is a drop from the previous value of 8 at

8 pm.

A. Yes.

Q. If you had seen those scores, would you have appreciated that Claire's condition was perhaps deteriorating?

A. I think it's very hard -- I don't have any recollection of it and it's very hard to disassociate what I know now and my experience now with how I might have looked at this in 1996. I think looking at -- her score had been 6 earlier in the evening, whenever she had been seen by the consultant paediatric neurologist, and she was on treatment for status epilepticus and meningoencephalitis, which were the two working diagnoses.

I'm not sure now ... With my experience now, I would certainly feel that that's a serious deterioration, but I'm not sure, in 1996, that I would have had enough knowledge or experience to question the fact that things were -- although they had deteriorated from the hour previously, they were similar to where they had been a couple of hours earlier when she had been seen by a senior colleague and, you know, treatment was in progress for that.

THE CHAIRMAN: Let me go back a bit on this. If you had got a handover from Dr Stevenson at 5 o'clock and that had been an informed handover by him, do you think that you

would have been given news that Claire was really very unwell?

A. I don't know, to be honest, because there seems to be -- looking at it -- again, this is just looking at the other evidence. It seems to be that that wasn't necessarily appreciated, that she was very unwell, although looking at this, it looks clear. You know, from ...

THE CHAIRMAN: Knowing what we know now, obviously because Claire has died, it seems, on the evidence I've understood, to be blindingly obvious that she was very unwell at 5 o'clock.

A. Yes.

THE CHAIRMAN: But Mr Roberts, when he gave his evidence last week, was wondering whether that's what everybody is now saying looking backwards or whether that is really what was realised at the time. Do you understand his --

A. I fully understand that.

THE CHAIRMAN: And does that seem to you to have some substance to it?

A. It does.

THE CHAIRMAN: We're all looking backwards now, but actually at 5 o'clock on Tuesday 22 October 1996, there was a number of opportunities with various people to see how

Claire was, and it may very well be that that was missed by a collection of people.

A. I appreciate that there doesn't seem to have been the level of concern at the time that, looking back on it, it appears there should have been. Does that make sense?

THE CHAIRMAN: It does. It leads into the question of, among many, many things, whether Mr and Mrs Roberts were allowed to go home on the Tuesday evening despite the fact that Claire was very unwell because, in fact, it wasn't realised that she was very unwell.

A. Yes.

THE CHAIRMAN: It's a bit hard to defend the fact that nobody seems to have twigged to the fact that she was very unwell; isn't that right?

A. Yes, I agree.

MR REID: If I can come back just to the midazolam and the increase in that. If we bring up the fluid balance sheet at 090-038-135, please, and if we go to page 136. You see on that, at the second entry on the intravenous fluid prescription chart, there's an amount:

"50 ml. Type of fluid: normal saline. Additives: plus 69 milligrams midazolam at a rate of 2 ml per hour over 24 hours."

And that's signed by Dr Stevenson and Nurse Taylor.

Is that something that should have been amended at the point at which the rate was increased to 3 ml per hour?

A. There's two thoughts on that. If it's a drug, it should be prescribed on the drug kardex as opposed to in the intravenous fluid prescription chart. On the other side of that chart, the rate at which it's given is recorded. But it really should be prescribed on the drug kardex because it contains a drug.

Q. So are you saying that in fact it's Dr Stevenson who erroneously put it on this chart instead of the drugs chart?

A. No, he put it on both. The reason it's there is because you have to record whatever fluid is given -- so the fluid is the normal saline, 50 ml -- and if you have an additive to it, then you have to record it, but it also needs to be prescribed on the drug kardex.

Q. My point is: the rate there is 2 ml per hour; should you, whenever changing the rate to 3 ml per hour, have amended that entry to say "3"?

A. It's difficult to amend that because it would be the same bag, so you can't score that out and rewrite it on another line because it would look like it was another bag. That would have been recorded on the other side of the sheet with the rate of increase noted on the other

side of the sheet at the time that it was increased.
Q. So you're saying it would just have been noted on the drugs prescription sheets?
A. It's also noted on the fluid prescription sheet on the other side.
Q. Ah, yes. I understand. So you're saying, if we go back to 135, that the increase is noted there at 22.00?
A. Yes.
Q. Where it says "At 3 ml per hour"?
A. Yes.
Q. Thank you. Would you have notified the ward sister or the nurse in charge of the change of prescription rate?
A. The nurse on the ward would have been notified.
Q. She would have been notified by you or by one of the nurses?
A. It would have been one of the nurses who asked me to write it up in the first instance. I would have rewritten it and the nurses would be aware of that.
Q. Just in terms of the midazolam, you say that you were unfamiliar with it at the time. Would you have been aware of any monitoring of Claire that would need to be done while she was receiving that intravenous drug?
A. Although I was unfamiliar with midazolam in this use, it is a benzodiazepine, which can suppress your respiratory rate, which I would have been aware of and I

would have expected her, as she was, to be connected to a saturation monitor and ...

Q. That's to monitor her O2 sats?

A. Yes.

Q. And those were satisfactory throughout the time that you were looking after her; is that right?

A. Do you have them on the observation --

Q. I think I do, yes. If we bring back up the CNS chart at 090-039-137, please. They're handwritten at the very bottom, you can see they're in the high 90s.

A. Yes, that's all satisfactory and her respiratory rate is also recorded there.

Q. If I can bring you just to the original drugs prescription sheet at 090-026-075, please. In terms of the sodium valproate, we can see that Dr Sands gave a 400 milligram drugs once only prescription at 5.15 pm; is that right?

A. Yes.

Q. And then there's an entry at F, which says -- and it's scored out -- "22 October 96, sodium valproate" and "21" and then -- I think it might be a "0", but I can't be sure -- "milligrams per 50 ml over two hours", "method of administration, IV", and your signature, and then "discontinued 22 October" and your initials as well?

A. Yes, that's correct.

Q. You were the doctor who both entered the continuous administration of sodium valproate and the doctor who discontinued it.
A. That's correct.
Q. So it's your writing. Do you think it says "210 milligrams", if we can blow that up? Is that "210"?
A. It's either "210" or "240".
Q. Yes. In fact, perhaps it could be 240 because her weight was 24 kilograms --
A. It looks more like "240", yes.
Q. -- 24 times 10, 240; would that be fair?
A. Yes.
Q. Would you have expected the continuous administration of the sodium valproate to be noted in the clinical notes?
A. I think it is noted in the clinical notes.
Q. I'm saying the fact that you started on the continuous administration of it.
A. In Dr Webb's note from earlier, I think he has prescribed it to be given as a stat dose followed by continuous infusion, hasn't he?
Q. If we bring that up, it's 090-022-055. Just the very final point:
"IV sodium valproate 20 milligrams per kilogram. IV bolus followed by infusion of 10 milligrams per kilogram

IV over 12 hours."

A. Yes.

Q. Is there any benefit to you making a note that that IV is started at some point?

A. You wouldn't usually. You would usually prescribe it and it would be recorded on the fluid balance sheet and in the drug kardex as to when it's started.

Q. If I lead you on that then, if we go to the fluid balance sheet at 090-038-135 and 136. Would you accept that on the basis of those fluid balance charts, that the sodium valproate's continuous infusion isn't noted on either?

A. Yes, absolutely, and I appear to have discontinued it very deliberately.

Q. What do you mean, you appear to have discontinued it very deliberately?

A. As opposed to just -- I put a line through it and signed it and dated it.

Q. What I'm saying is, apart from your note in the kardex that it's started and then discontinued, there's no other note to say that it was actually administered over that time; would you accept that?

A. Yes. Yes, I would.

Q. Do you know whether at all whether it was administered at that time?

A. I don't have any direct recollection of it, but I can assume from that that it wasn't, but I can't give you an explanation as to why not.
Q. For example -- and I know we're dealing with possibilities -- is it possible that you looked at Dr Webb's note, wrote it up and then decided that actually it wasn't being administered so you discontinued it at the same time?
A. Yes. I mean, I think that's likely what's happened, I've written it up and then, for whatever reason -- that's what I can't recall -- I have discontinued it. It doesn't appear to have been given as the continuous infusion.
THE CHAIRMAN: Your point is that you wouldn't have done this off your own bat, that would have been after some discussion with somebody?
A. Yes, and I'm not sure what the reasons for that may have been, but I have no recollection of it, so I can't expand any further on that.
MR REID: The chairman makes the point, as you said, you wouldn't have done it off your own bat.
A. I don't think so.
Q. And as a junior SHO, you probably wouldn't have taken your own initiative and discontinued it; would that be correct?

A. Yes.
Q. Would that mean that you would have had to have had direction from a senior doctor?
A. In all likelihood, yes.
Q. I suppose the obvious question is: do you know of any note in the notes that says that it was to be discontinued?
A. No.
Q. And you've no idea who the senior doctor might have been to have given you that information?
A. Well, I haven't recorded who that may have been.
Q. Again, should the contact from the senior doctor that it was to be discontinued have been noted?
A. I think, in hindsight, absolutely. You know, in hindsight it helps to work out your thought processes later when you can't remember.
Q. Because even the midazolam increase was noted in the nursing notes --
A. Yes.
Q. -- but the direction to discontinue the sodium valproate from a senior doctor wasn't noted in the nursing notes; isn't that right?
A. No, I accept that.
Q. If I can bring up 090-026-075 and 077 together, please. Actually, we might need to -- on the left-hand side

we can see at C, it's:

"22 October 1996, cefotaxime, 600 milligrams to be administered at 6.30 am, 12.30 pm, 5.30 pm and 9.30 pm by IV."

And that's signed on of by Dr Stevenson; do you see that, doctor?

A. Yes.

Q. If we can blow up number 077, we see, at 5.30 pm, there is a "C" marked?

A. Yes.

Q. And this is your signature, your initials; is that right?

A. Yes.

Q. We've heard from various witnesses that the practice at the time was that drugs were double signed.

A. The nurses' practice was to double sign drugs. The doctors tended just to sign it themselves.

Q. Was it the case that doctors would sign it, expecting that a nurse would double-check it at some point and sign it off as well?

A. No, generally speaking when the doctors gave the first dose of medication, and usually just signed it the once, the nurses tended to double-check.

Q. So would it be a regular occurrence then for the doctors to have been the only signature down --

A. Yes.
Q. Okay.
THE CHAIRMAN: So if a nurse signs it, there should be a second signature, and that might be a nurse or, if a doctor comes along, the doctor can be the second signature for a nurse?
A. Yes.
MR REID: On the basis of that, you think that you administered the cefotaxime at 5.30.
A. Or thereabouts. Generally speaking, it wouldn't always be exactly at 5.30, it might be somewhere in and around that time, but you would sign it in that box because that's what was available.
Q. And the administration of cefotaxime is noted on the fluid balance chart. We've heard some evidence from the nurses about that. Do you have any explanation why it's not on the fluid balance chart? I know that's filled in by the nurses.
A. Cefotaxime? It's a small dose. It is not usually recorded at all on a fluid balance chart.
Q. That's what Staff Nurse McCann said.
A. Yes.
Q. The cefotaxime was to be administered at 9.30 as well.
A. Mm-hm.
Q. You attend at 9.30, as we can see from the chart in

front of us, and certainly you administered D, which is acyclovir.

A. Yes.

Q. And there's also an "A" noted there, which is -- if we bring up 075 again, please -- phenytoin. Phenytoin is A. Do you have any knowledge of whether phenytoin was administered at 9.30 pm?

A. I don't. I don't recall.

Q. Because the other evidence the inquiry has heard seems to be that it was administered around 11 o'clock at night.

A. Okay.

Q. You were administering the acyclovir at that time.

A. Yes.

Q. Do you have any reason why the cefotaxime wasn't administered at that time as well?

A. There could be a few reasons. One may be that if the first dose was given a bit later than initially prescribed, you might leave it a little bit later before giving the subsequent doses. It may be that there wasn't an IV line available; the acyclovir's given over an hour or so, so it may be that you would have to wait until that's been administered and then give the second dose of cefotaxime whenever you have a line free.

Q. It certainly seems from what we've been discussing that

that first one, the cefotaxime, was given at the correct time of 5.30, so it wasn't given late; would you accept that?

A. I can't remember, to be honest. If that's the evidence that you have, then that's fine.

Q. It seems from the charts that you gave it at 5.30, which was the scheduled time. So you're saying you think the reason the cefotaxime wasn't given was because one of the IVs was filled with acyclovir at the time --

A. That's one explanation. Also, if the nurses are giving the subsequent doses of cefotaxime, it may be that -- I think probably the most likely explanation is that there was no IV line, to be honest, given that she's having a couple of different infusions.

Q. In those circumstances, do you make a note to say: cefotaxime still needs to be administered here?

A. Me personally make a note?

Q. Yes.

A. No, because it would be the nurses administering it at this point. The first dose of antibiotics are given by the doctor and subsequent doses are given by nurses, in 1996.

Q. Did that only apply to antibiotics or to other intravenous medication?

A. Mostly antibiotics, all other medication as well, but

there are some other medications that the doctor always gave.

Q. Would an example be those anticonvulsant drugs?

A. Usually, yes. I think. I can't quite remember, but I think that would be the case.

Q. For example, the 11 o'clock administration of the phenytoin?

A. Yes.

Q. Would you have expected that to be done even though it was a second dose? Would you have expected that to have been done by a doctor?

A. I can't quite recall what the normal practice in 1996 was, but I think that's possibly the case.

Q. So the acyclovir, you think, was given at 9.30.

A. Yes.

Q. We see again from the chart in front of us the phenytoin is ticked for 9.30 pm there as well.

A. Yes.

Q. Again, what reasons do you think that the phenytoin wasn't given at 9.30 and was given instead at 11 pm?

A. Well, I took a phenytoin level at 9.30, and I would expect, as we heard this morning, that you would withhold any subsequent doses until you had the level back.

Q. Would it ever be the case that you would see that it's

to be given at 9.30, so you obtain the bloods in advance of that so you have the levels for the time it's to be administered?

A. Um ... Well, you have to take the level at a certain time and I think 9.30 was the appropriate time to take it, after administering the loading dose. If you take it too soon, you won't get an accurate level.

Q. We had the ward sister, Angela Pollock, giving evidence last week. Do you remember Angela Pollock?

A. Yes.

Q. If I can bring up her evidence, it's day 50, 30 October, at page 163. I think that might be the wrong page. We'll come back to that maybe at the break.

As you say, you were the only medical SHO on during that period.

A. Yes.

Q. If I can bring up the record of attacks observed at 090-042-144, please. There are two attacks observed during your period on duty in and around Allen Ward; isn't that correct?

A. Yes.

Q. The first at 7.15. There's:

"Teeth clenching and groaned; duration, 1 minute; state afterwards, asleep."

I think you've said in your statement you have no

knowledge of being informed about that attack; is that right?

A. No.

Q. At 9 pm, there's then the episode of:

"Screaming and drawing up of arms. Pulse rate increased up to 165bpm, pupils large but reacting to light. Doctor informed. Duration 30 seconds. State afterwards, asleep. [Initials] Lorraine McCann."

Do you have any knowledge of whether you were the doctor informed at that time?

A. I don't have any direct recollection, but it's likely that I was.

Q. Yes. In fact, Staff Nurse McCann has given evidence to say that although she can't be sure, she thinks that the most probable person, just from logically working out, was yourself.

A. From general practice.

Q. Because the SHO would have been the first port of call; is that right?

A. Yes.

Q. If you were informed about the seizure, what do you think you would have done?

A. It depends on what I was informed of. If the seizure had finished and she was asleep now, then other than go along and do ... Well, you would want to go along and

reassess and have a look at things, which is obviously what did happen at 9.30. You want to have a look at the attacks she's had, have a look at her Glasgow Coma Scale, have a look at her pulse and blood pressure and see how things were progressing.

Q. Claire's parents say that they left the hospital at about 15 or 20 minutes maybe after this.

A. Yes.

Q. And you're recorded as being present in and aroud 9.30 to write the drugs sheet?

A. Yes.

Q. Do you think it's perhaps probable that you were aware of this attack whenever you attended at half nine?

A. Yes, I think it's probable.

Q. You said, on the basis of that, that what you would do is reassess Claire and you would look at her Glasgow Coma Scale and look at different elements of her care.

A. Mm-hm.

Q. So effectively, do you think that at half nine you would have done probably, if not a full examination of Claire, you would have done what you would consider to be a proper examination of her in any event?

A. Yes, I think so.

Q. At least, at your experience level.

A. Yes. I mean, I would have ... It's a child who's

reported to have had a seizure-type episode, who's on anti-epileptic medication, and is on hourly CNS obs, so I would have wanted to reassess all of that information and see where I thought things were going.

Q. Okay. Again, you don't recall, but you now know the information you would have had at around 9.30.

A. Yes.

Q. First of all, what do you think you would have considered Claire's condition to be at half past nine in the knowledge of that material?

A. With hindsight, as I said earlier, looking back at it, it's very hard to not appreciate that she was a very sick child. However, looking at both Mr and Mrs Roberts' statements and the other statements from the nurses, I'm not sure that there was an appreciation of how sick she was, and I'm not sure that I would have appreciated that at the time.

THE CHAIRMAN: Sorry, but the reason why there's no appreciation in Mr and Mrs Roberts' statements is that nobody has told them she's sick.

A. I know that.

THE CHAIRMAN: So they've expressed concerns -- in fact, they have expressed concerns from 11 o'clock in the morning.

A. I appreciate that.

THE CHAIRMAN: So if we're going to work out, with hindsight, what the level of appreciation was, you effectively have to discount Mr and Mrs Roberts because they're depending on the doctors and nurses telling them how sick she is.

A. I appreciate that, absolutely. What I'm saying is that I may not have appreciated it either from whatever information I was given. That's my point.

THE CHAIRMAN: Sorry to be blunt, doctor, is that because of your comparative level of experience at the time?

A. Absolutely. It's hard for me, looking back now. With the experience that I have now, you can clearly see that this is a very sick child, but it's very hard for me to look back at how I would have been, as a first-year SHO, looking at this as a child who has a Glasgow Coma Scale of 6, she had a Glasgow Coma Scale of 6 earlier in the evening when she was seen by a more senior doctor and she was on treatment for that. So it's very hard for me to put myself in my shoes in 1996 and see -- it would be very hard to challenge or to question more senior input.

THE CHAIRMAN: But then sort of begs of question of who we are challenging or who you would be challenging. Looking back on it, as you have done obviously to prepare to give your evidence, from Claire's history that day, particularly from the Tuesday morning, at what

point now would you become worried about her condition?
A. Now with my level of experience?
THE CHAIRMAN: Yes.
A. In the early afternoon. Well, I would have been concerned about her from the start, but I would have been more concerned in the early afternoon when her Glasgow Coma Scale first fell first of all.
THE CHAIRMAN: She doesn't appear to be responding positively to the treatment she's getting from --
A. Multiple anti-epileptic drugs.
THE CHAIRMAN: Yes. So that should certainly be apparent at 5 o'clock.
A. Yes.
THE CHAIRMAN: Thank you.
MR REID: Can I sum up then your actions with regard to Claire? It seems you administered cefotaxime at 5.30 pm, and it seems then that you returned at 9.30 pm, and, at that point, you rewrote the drugs prescription chart, you discontinued the sodium valproate -- if it was ever started -- and you increased the midazolam dose.
A. Mm-hm.
Q. Would I be correct in that so far?
A. Yes.
Q. You also then took for the phenytoin level and, at the

same time, you were taking bloods for U&E.

A. Yes.

Q. Is that then a fair summary of everything that you did in Claire's case?

A. I think I inserted a line as well, an intravenous line at that point.

Q. I do apologise. You also inserted an IV line in order to start the acyclovir at 9.30.

A. Yes.

Q. At 9.30, you were there doing a full assessment. You say you probably would have been made aware of the episode of screaming and drawing up of arms.

A. Yes.

Q. You would have been aware that her GCS had dropped from 8 to 6, at least in the last hour. And you would also have been aware that the last time she had been seen and assessed by a doctor had been four-and-a-half hours previously by Dr Webb.

A. Yes.

Q. And it would be safe to assume that her condition certainly hadn't got any better in that time.

A. Yes.

Q. I mean, in fact, I think we've already debated about whether it had deteriorated over that period. If you had known about that attack at 9 pm, would you have

accepted on the basis of that that it had deteriorated?
A. Well, it's hard to say on the basis of that one attack that it had deteriorated. I don't think that -- I think you have to take the whole thing into consideration rather than just that one episode.
Q. Well, with your knowledge of the episode, your knowledge of her GCS, the knowledge of the medication she would have had and also the knowledge that a doctor hadn't seen her in four-and-a-half hours, do you think with that knowledge that that was an opportune moment to contact a senior doctor, say Dr Bartholome, in order to ask them to see what was obviously a sick child?
A. And I may have contacted Dr Bartholome at the time. I just have no recollection of it. I may have discussed with her all of this at the time, but there's no record of it, so I can't say whether it did or didn't happen.
Q. If we can bring up beside each other 090-022-055 and 056, please. We can see on the screen the note by Dr Webb at 5 o'clock and then the note by Dr Stewart at 11.30 pm. I have just gone through with you the summary of the things that you did in Claire's case --
A. Yes.
Q. -- but there isn't a medical note of any of that.
A. Yes.
Q. You'd accept that?

A. Yes.
Q. Would you accept that in the context of all of the things I've just said, including the fact that you probably did a reassessment of her and the fact that you had been made aware of this 9 o'clock episode, that making a clinical note would have been at least one of the minimum things that should have been done at that stage?
A. I think, in retrospect, making a clinical note would have been very helpful, yes.
Q. If I can then turn just to your handover to Dr Stewart in and around 10 o'clock. Dr Stewart says he arrived into the hospital around 9.30 to receive the handover from you. We've just gone through what you might have known at that stage. What do you think you would have relayed on to Dr Stewart at the handover at 10 pm?
A. Again, this is hypothetical because I don't remember what happened that night. But I would have expected me to hand over to him the fact that Claire was on hourly obs, that she had a very low Glasgow Coma Scale, that she was on a number of anti-epileptic drugs as well as antivirals and antibiotics, and that she had some blood tests checked, the results of which would be outstanding and should be checked.
Q. Dr Stewart's first attendance is at 11.30, when the

sodium and phenytoin results come in. If you had been concerned about Claire, maybe to the extent that you would want the senior doctor involved, do you think you would have told him that at 10 o'clock?

A. I think I would have, but I think from reading his deposition that the senior doctor was aware of Claire and how she was at the time as well. So I think that was -- that may have been something that I handed over to him, but I think we were aware at the time. But I can't ...

THE CHAIRMAN: Let's set aside hindsight. Is it not your position, doctor, that because of your level of experience in 1996, you really didn't quite appreciate how significant Claire's problems were?

A. I think that's probably reasonable, yes.

THE CHAIRMAN: So that when you handed over to Dr Stewart, assuming there was a handover, then that may not necessarily have flagged major concerns on his part because, if it had, he might well have seen Claire some time before 11.30?

A. I may not have handed over the significance of it, but I certainly would have handed over the fact that she was on medication and that she needed some results checked. But I agree that I may not have appreciated the severity of it.

MR REID: We have a few minutes just before we break. You're currently on the clinical governance committee at the Children's Hospital in Temple Street in Dublin; isn't that right?

A. That's correct.

Q. And you have been part of that for the last year; isn't that right, doctor?

A. Yes.

Q. Okay. What experience do you have as part of that clinical governance committee in audits or in discussions or investigations after the death of a child?

A. The clinical governance committee in Temple Street is quite a new thing. It has only just been set up in the past year. We don't -- part of our remit is not to carry out audits. That would be done as part of the morbidity and mortality meetings. And they do occur regularly in the intensive care and, more recently, in our unit as well.

Q. Let me ask you: in October 1996, when was the first time that you learned that Claire Roberts had, unfortunately, died?

A. I can't recall the first time. When I was asked to give a statement to the inquiry is the first recollection that I have now of it.

Q. So you hadn't heard it from any other doctors or anybody else who was on at the time?
A. I'm sure at the time I did hear of it, but I can't -- I don't have any recollection of it now.
Q. I understand the distinction.
Were you ever involved in any audits or investigations or discussions following Claire Roberts' death?
A. Claire's? No.
Q. And you're sure about that, it's not just that you can't recall?
A. No, I'm quite sure. I would remember if I'd been involved in any.
Q. You're now a consultant paediatrician.
A. Mm-hm.
Q. Looking at October 1996 standards, would you have expected to have been involved in any audit or investigation following Claire's death?
A. I'm not sure it would have been standard at the time to investigate every death in the Children's Hospital, particularly if it was felt that there was a reasonable explanation for the death.
Q. Well, would you have expected her death to have been discussed at a morbidity and mortality meeting, for example?

A. Yes. I mean -- well, it's hard to remember what exactly happened in 1996. Certainly from about 2000 onwards, my last period in Children's Hospital, there were regular morbidity and mortality meetings. I can't quite remember if they were quite so regular in 1996, but they were from 2000 onwards, certainly.

MR REID: Mr Chairman, perhaps we can take a short break and I can see if there are any questions from the floor. Otherwise, I have nothing further.

THE CHAIRMAN: We might take about 15 minutes. I think there are some issues about tomorrow's witnesses, which we have to resolve. We'll try and do that in one go. I'll come back at 3.25.

(3.10 pm)

(A short break)

(3.45 pm)

THE CHAIRMAN: Some more points?

MR REID: Just a small number of points.

First of all, if I could bring up Dr Hughes' witness statement at WS140/1, page 13, please. At (d)(i), I've been asked to check with you your answer to that question. You were asked whether Dr Sands was a senior registrar grade, and your answer was that:

"Dr Sands was a paediatric registrar and, so far as [you] can recall, it was one of his first registrar

posts and he would not have taken on consultant-level responsibilities and would have consulted more senior members of staff if he had concerns."

Just to confirm with you, is that correct?

A. Yes, that's correct.

Q. Thank you. The second point is --

THE CHAIRMAN: Sorry, at that time was there a senior registrar grade as opposed to a registrar?

A. There were still some of the older registrars who would have not been on the new contract. The Calman project had just started, so Dr Sands would have been one of the first few registrars on the Calman project. But some of the older registrars would still be known as "senior registrar".

THE CHAIRMAN: Thank you.

MR REID: If I just ask you about U&E results. You took bloods at half nine for the phenytoin and took U&E results [sic] at the same time.

A. Yes.

Q. I presume that was because you were taking blood, it was routine to take the U&E at that time as well; would that be correct?

A. It may have been handed over in the handover at 5 o'clock. I don't have any direct recollection. In a child who's on IV fluids, they should definitely have

at least one, if not more than one, U&E in a day. And Claire obviously hadn't had any from the night before, so she was definitely due a U&E.

Q. That was the question I was going to ask you. How often you would expect -- you say you would expect twice a days; is that what you're saying?

A. I think if you have any discrepancy, if they're outside of the normal range, you would expect more than once a day.

Q. The discrepancy you're talking about is the 132 level from the previous evening?

A. It was a slightly low sodium, yes.

Q. And do you think that on coming on at 5 o'clock through either the handover or through your contact with Claire over that time, you would have been aware that her U&Es hadn't been taken since the previous evening?

A. I can't answer that because I have no recollection of the day, so I can't answer --

Q. Would it have been your normal practice to check in the notes to see when the last U&E had been done?

A. No, it would be normal practice to be told that certain U&E levels needed to be checked. In the handover that occurs now, you would know of all the patients that are on IV fluids and in that case you might, but in 1996 I don't think you would be aware of every patient that

was on IV fluids, so you would need to be told specifically that a U&E needed to be checked.

THE CHAIRMAN: If there was confusion about the reading of 132, the height of the confusion was whether it was the result from Monday night or the result from Tuesday morning.

A. Yes.

THE CHAIRMAN: At 5 o'clock, it would have been realised, at worst, that there had been no test since Tuesday morning --

A. Yes.

THE CHAIRMAN: -- at either 9 o'clock, when the ward round might have normally have been expected to start, or at 11 o'clock, when the ward round appears roughly to have been done.

A. Yes.

THE CHAIRMAN: At 5 o'clock that would have been time for a repeat U&E, wouldn't it, in light of the fact that the reading which was available at that time was a bit lower than normal, but also taking into account the lack of progress in Claire's condition during the day?

A. Yes, and I think given that she's due to have a blood test taken at 9 o'clock for phenytoin level, it has to be done at 9. It would be reasonable in children to bunch up tests.

THE CHAIRMAN: Okay.
MR REID: And that's just so they're not --
A. [OVERSPEAKING].
Q. If I can bring you just to the original prescription chart at 090-026-075, please, and 076 alongside it. Your evidence earlier was that the regular prescriptions on the left-hand side were parenteral drugs, so they're the IV drugs, and the ones on the right-hand side would be those oral drugs, drugs of that nature.
A. Yes.
Q. I've been asked to ask you: the diazepam was done rectally rather than by IV.
A. It's in a separate part, though, it's in the "drugs once only prescription" part, it's not in the parenteral drugs part. It's "parenteral drugs regular prescriptions" on the top on the left, and "drugs once only", which can be either way -- IV, PR or oral -- and then the other page, which has the greater number of spaces, would be for your regular oral or NG or rectal prescriptions.
Q. So the top half of 75 is "IV drugs --
A. Yes.
Q. -- regular prescriptions" and the bottom half is "drugs once only prescriptions" of any nature?
A. Yes.

Q. And the right-hand side is regular prescriptions of a non-IV nature?
A. Yes.
Q. If I can just ask you about the acyclovir on the left-hand side at D. We can see there it's to be administered at 8.30 am, 12.30 pm and 9.30 pm. And you administered it as per Dr Stevenson's prescription at 9.30 pm.
A. Yes.
Q. Dr Webb directed that acyclovir be prescribed at his note at 090-022-055, if that can be brought up. You can see there, plan number 1:

"Cover with cefotaxime and acyclovir, 48 hours. I don't think meningoencephalitis very likely."

Is there anything that you can glean from the fact that the acyclovir wasn't to be administered from Dr Stevenson's note of the prescription until half nine?
A. I can't explain Dr Stevenson's thinking, although acyclovir wasn't always necessarily available on the ward. But I don't -- I can't explain why he has prescribed it for those times. Often you would prescribe drugs for particular times to make it easier for administration, but I don't know why he chose those times.
Q. Would there be any level of urgency in ensuring the

administration of the acyclovir in those circumstances?
A. Again, it depends on whether or not it was available on the ward at the time. I can't explain his actions.
Q. It's Dr Stevenson's actions, I accept that.
And just if we bring back the rewritten prescription sheet, 090-026-073. Just out of interest, how often would senior house officers have to rewrite drugs kardexes; is that a common occurrence?
A. Very common. That would one of the things you would do regularly, that would be one of your duties.
Q. It would be a very regular occurrence?
A. Yes.
Q. Just as a final point is Staff Nurse Pollock's evidence, which I tried to bring you to earlier. 30 October, page 167, please. I asked her at line 6:
"Question: When you say you would double-check --
"Answer: There would be two people checking it.
"Question: What things would you be checking?
"Answer: You would be second-checking in those days. As is the case now, IV medications would always be second-checked by either two registrants or a doctor and a nurse, and that's always been the case. But in the case of an IV drug, it has to be second-checked by someone."
I think you said earlier that doctors would just

sign off the IV drugs themselves. Can you explain in any way the inconsistency there seems to be there between what you're saying about the doctors signing once and the fact that she says that IV drugs need to be double-checked?

A. My recollection is that doctors signed for IV medications and it wasn't double-checked with a nurse. If you were signing on a fluid prescription sheet, you might double-sign it, but on the drug kardex, my recollection is that doctors signed for giving the IV drugs.

Q. Has that changed in any way since 1996?

A. It may have, I'm not certain, to be honest. I know that certainly, in 1996, my recollection is that you would sign it just yourself.

Q. You're currently a consultant paediatrician with an interest in inherited metabolic disorders.

A. Yes.

Q. Do you have to prescribe intravenous drugs on a regular basis?

A. Yes.

Q. In your job currently, is it a common occurrence in your hospital that they are double-signed or do doctors sign by themselves?

A. No, it is not a common occurrence that they are

double-signed; they are usually only single-signed. It is common that you would double-check with someone if you're making complicated calculations, and I think that's good practice at any point, but it doesn't necessarily need to be double-signed when you administer the drug.

Q. And would that particularly be with drugs you would be unfamiliar with?

A. That's with any IV drugs.

Q. Or drugs that would be potent or drugs?

A. Again, it's with any IV drugs. It's good practice to check your calculations at all times, but it's not practice in our hospital to have them double-signed on the prescription sheet.

MR REID: Mr Chairman, unless my friends have anything further. I have no further questions.

THE CHAIRMAN: Okay. Doctor, thank you very much for coming up again for us. Your evidence is now complete.

(The witness withdrew)

TIMETABLING DISCUSSION

THE CHAIRMAN: Tomorrow's evidence: Dr Stewart is giving evidence by video link from, I think, Texas.

MR McALINDEN: Savannah, Georgia.

THE CHAIRMAN: I think the connection with him is due to be made from any point after 12.30. We have a two-hour

time period to run that in. So that's the easy part of tomorrow. Perhaps even 12 noon.

In relation to Dr Herron and Dr Mirakhur, you'll remember the point that Dr Herron gave evidence on the inquest on the basis that he wrote the autopsy report, but then subsequently advised the inquiry that it was actually primarily the work of Dr Mirakhur.

We have a number of statements from doctors Herron and Mirakhur, who we want to do in clinical and governance terms. The idea was to do them tomorrow. We received Dr Herron's governance statement in July and then, on 23 October, we received some further documents from him, which are attached to his third witness statement at pages 74 to 77. There's a chart which may look familiar to you, and then there are some slides or copies of slides.

We've asked Dr Squier for a further note on this issue and on governance, and I understand it's going to be available this afternoon, which is good in the sense that we're going to have it, but it gives Dr Herron and Dr Mirakhur limited time to look at it. I'm wondering how best we can get through the next couple of days.

MR REID: Mr Chairman, just to correct one point, I think you said that Dr Herron's governance statement was received in July; it was received in September.

THE CHAIRMAN: Sorry, September. And the additional piece of information at the clinical end came through on 23 October. I presume Dr Herron and Dr Mirakhur will want to see this latest statement from Dr Squier before they give their evidence.

MR McALINDEN: I'd say they'd be very anxious to see that information.

THE CHAIRMAN: If we can get that out this afternoon, Mr McAlinden, and start their evidence -- this would run it late -- but start their evidence after Dr Stewart tomorrow, you could have tomorrow morning. They could see it tonight and you could have tomorrow morning with them.

MR McALINDEN: Yes.

THE CHAIRMAN: That's going to knock on a bit on the timetable. It was probably a bit optimistic that we would get through both doctors Herron and Mirakhur tomorrow in any event. If Dr Stewart can be available from noon, shall we take him at noon and then start after he's finished with whichever of Dr Herron and Dr Mirakhur might be discussed between you and Ms Anyadike-Danes?

MR McALINDEN: Yes. Just one issue in relation to Dr Stewart's timing. I take it that is our time as opposed to his time.

THE CHAIRMAN: It's our time. Noon our time, which is 7 am for him. He's willing to do it, so let's not cut across him.

Look, let's do it on this basis, ladies and gentlemen: we'll start later than planned tomorrow. We'll start with Dr Stewart. If you could be ready from midday for Dr Stewart. We will try to get Dr Squier's report out this evening to you. That will give DLS and the other parties, for that matter, an opportunity to see what she is saying in her latest statement.

I think we've copied to the parties some correspondence and DLS have been raising a concern since September about Dr Squier. There is a further DLS letter, which I think was sent in to us perhaps last Monday or Tuesday about some other criticism in the same line of cases, shaken baby cases. That will be circulated as well so that you can see what the position is, what the DLS position is about that; okay?

Mr Sephton?

MR SEPHTON: Sir, I wonder if we could address other timetabling matters. One sees that at the moment we have Dr Scott-Jupp and Dr MacFaul for 12th and 13th. I came in this morning and saw a voluminous report from Dr Young. We have further evidence possibly from Professor Neville. We have the two mystery witnesses,

Mr Shields and Miss Chambers. I am raising with the inquiry whether the clinical part of it will finish on the 13th.

THE CHAIRMAN: I think, Mr Sephton, in light of what we've just been discussing about Dr Squier's report, I think we can now take it that it won't finish on the 13th. What we'll do over the next 48 hours is to work out how and when we will finish it. Professor Cartwright and the other three witnesses are on Wednesday and Thursday. They are all coming over from England and I'm exceptionally reluctant to cancel them. Ramsay and Aronson are not affected to any significant degree at all -- I think Ramsay not at all -- about any of the pathologists issues. So we should be able to go ahead with Cartwright, Ramsay and Aronson as scheduled. The question is how we then manage Mirakhur, Herron and Squier.

MR SEPHTON: Might I just suggest, while I'm on my feet, that the examination of Scott-Jupp and MacFaul might take longer than a day at the rate we've been going.

THE CHAIRMAN: Thank you very much. Yes, we're going to lose a day or so on this and we'll have to work out how best we can accommodate that.

The other two witnesses who you refer to from the Trust, I anticipate, even though we don't have witness

statements from them, that they're likely to be short. Either they have an explanation for where Dr Steen was or they don't. I didn't understand the information we got as giving a definitive explanation about where she was. I think it flagged up another possibility rather than anything definite. Is that fair?

MR McALINDEN: Basically, to give some explanation in case some explanation is sought at this stage, it's clearly a case that Dr Shields has a diary, and in that diary there is a reference to a meeting taking place on Musgrave Ward with Dr Steen on the morning of 21 October. It's in relation to the King's Fund audit, and it may well be that on 22 October part of that audit process, a mock audit, would have been taking place in the Children's Hospital involving Dr Steen. That is the issue that's being explored at present.

THE CHAIRMAN: Okay. Since we have that diary note, is there much more exploration to do on that, do you know?

MR McALINDEN: Unless the diary note can be backed up with personal recollection of those witnesses, I think there's very little else that can be done.

THE CHAIRMAN: In that event, can we get the witness statements in and let's get this little bit -- this is actually quite a tight bit of evidence. Can we get it in as soon as possible? It might not even be necessary

for the witnesses to give evidence if all they can say is: this is a diary note, we did it, she was there at a meeting on the Monday, and then we did part of the mock audit on Tuesday.

MR McALINDEN: It's hoped that statements should be available within the very near future.

THE CHAIRMAN: Thank you very much indeed. Ladies and gentlemen, tomorrow at midday for Dr Stewart from Savannah, Georgia. Thank you.

(4.05 pm)

(The hearing adjourned until 12.00 pm the following day)

I N D E X