Tuesday, 8 May 2012

(10.00 am)

(Delay in proceedings)

(10.05 am)

DR MALCOLM COULTHARD (called)

Questions from MS ANYADIKE-DANES

THE CHAIRMAN: Doctor, you can take it that you know -- I think you have been following -- we've had three weeks of evidence so far.

A. Indeed, yes.

THE CHAIRMAN: Some parts of that have been particularly helpful and significant in clarifying some factual issues we were unclear from the statements and people -- particularly Dr Taylor -- have changed their position and we've also had quite a bit of expert evidence last week.

So your reports are taken as read. Ms Anyadike-Danes will not take you through your reports. Your evidence today and, if necessary tomorrow, will focus on the more important areas which are still perhaps in dispute; okay?

A. Yes, I understand, thank you.

MS ANYADIKE-DANES: Dr Coulthard, good morning. There are a number of your reports. I'm not going to read them all out now. I will perhaps clarify with my learned

friends that they have received them all. But in any event, the first of them is dated 9 August 2010 and they continue up to -- the last substantive report being 17 March 2012. Then there is one latter one that's just come in, in April of this year, dealing with a particular point in relation to dialysis, peritoneal dialysis.

So there they are. I take it that you are standing over those, save any comments that you have to make in your oral testimony?

A. Yes.

Q. Thank you. Do you have a copy of your CV there?

A. Not with me, no. (Handed).

Thank you.

Q. I hope everybody has a copy of it. It would have come rather late in the day, but anyway there it is now. I wonder if we could start with discussing some elements of that CV. Firstly, if we go to your -- you started off, I understand, at the Royal Victoria Infirmary, is that correct, before you then went to London?

A. Yes, that's right.

Q. Pausing there, are there two hospitals in Newcastle?

A. There are two that are involved in transplantation.

Q. So it's the Royal Victoria and what's the other one? Is it the Freeman?

A. The Freeman Hospital.
Q. Does one specialise in paediatrics rather than the other?
A. Nearly all of the paediatrics, but not all of it, that goes on in Newcastle goes on in the Royal Victoria Infirmary. Paediatric cardiology goes on in the Freeman, but all the rest of paediatrics including nephrology goes on at the RVI. Transplantation is almost entirely centred at the Freeman Hospital, so there's cardiac, liver and kidney transplantation in a transplantation centre at the Freeman Hospital. The only transplantation that went on at the RVI when I started in 1984 was paediatric transplantation and a small number of adult kidney transplants. And subsequently, all transplantation occurs at the Freeman apart from children's kidney transplants; they still occur at the RVI.
Q. When you started, if I can put it that way, were those two hospitals in different trusts so far as you're aware?
A. When I started, trusts were not a phenomenon that existed. They were two separate hospitals with two different managements --
Q. Managed separately, sorry, is the point that I'm getting at.

A. Yes, they were.
Q. Then if we go to your period in Guy's, I think you were -- actually, before that you were in Great Ormond Street.
A. That's right.
Q. What took you there?
A. By 1981, in Newcastle, there were no paediatric nephrologists in Newcastle. Children's kidney disease was looked after by general paediatricians and there was very little transplantation at all of children and it was identified in Newcastle that there was a need to start a department of paediatric nephrology, and I was -- as a result of that decision, I spent two years in London training to become a paediatric nephrologist and came back to a post so that, in 1984, I returned back to Newcastle and then became a consultant in 1985. So that was two years of training, the first year at Great Ormond Street.

The configuration of services in London has changed in that time. When I was at Great Ormond Street, no kidney transplantation went on at Great Ormond Street. London effectively worked as a unit where Great Ormond Street was the hospital that did the majority of acute kidney management.

So they dealt with children with all sorts of kidney

diseases. But those children that got to the point that they would be considered for transplantation were then transferred to Guy's Hospital. So I spent a year at Great Ormond Street training in paediatric nephrology in general and I then went to Guy's Hospital. At Guy's Hospital, at that time, there was obviously some general paediatric nephrology going on, but the main emphasis at Guy's Hospital was dialysis for chronic cases, ie children who have got permanent long-term kidney disease and transplantation.

Q. Can I just ask you, was Professor Koffman there when you were at Guy's?

A. No.

Q. So you spent your time in Guy's and then you come back. And when you come back, is the idea then that you will develop the paediatric renal transplant service in Newcastle?

A. Yes.

Q. How were you able to do that? Where did you get your resources from in terms of surgeons, anaesthetists and so forth?

A. It has obviously evolved considerably between 1984 and 2012, but in 1984 paediatric nephrology was really practised by general paediatricians and I then came in to lead on the medical side. I then became the

paediatric nephrologist and looked after all the children, and as has happened elsewhere -- and I know happened in Belfast for the first few years -- for the first 7 or 8 years, I was single-handed so I was the only paediatric nephrologist in Newcastle. It subsequently built up. That's from the medical perspective. From the surgical perspective, transplantation surgery has always been done in Newcastle by transplant surgeons as opposed to paediatric surgeons.

When I went back there and they -- when I started there they'd done one or two transplants in older children, teenagers. They hadn't really done any transplantation in young children. Immediately when I started there, I liaised very closely with the transplant surgical team -- some of them were at the RVI and mostly at the Freeman and increasingly moved across to the Freeman. But I liaised with them directly and they were direct colleagues rather than paediatric surgeons.

In terms of the anaesthetist arrangements, they were very different in 2004 from what -- again, from what they are now. In 2004 --

Q. Do you mean 2004?

A. Sorry. In 1984. From 1984 to 2012, I beg your pardon.

In 1984, when I was required to do an anaesthetist -- required an anaesthetist to do a transplant, I would ask for the anaesthetist on call, who was the anaesthetist that would cover children's surgery, but was not very often -- very often was not a paediatric anaesthetist, it would be an anaesthetist covering a general rotation. And my relationship with the anaesthetist in relation to transplant surgery -- I don't know if you want me to expand on that now.

It was very different from how it is now. Over the years, we've increasingly become -- to sub-specialise and now I would only deal with the consultant paediatric anaesthetist, but in those days you had a paediatric -- sorry, a general anaesthetist, consultant anaesthetist.

Q. We are going to come back to that relationship, which will cover the sorts of discussions you would have when you were actually faced with the offer of a kidney for transplant. What I'm really asking you to help us with at this stage is actually your experience in developing a paediatric renal transplant service.

You'll probably appreciate from the evidence that Professor Savage has given that he also had a task facing him, roughly like that, when he was the only consultant paediatric nephrologist, and he was also trying to develop a paediatric renal transplant service

coming out of the Belfast City Hospital, which was a separate hospital, and in those days from a separate trust.

So it would be helpful for you to explain how you developed that, initially where you obtained your protocols from and what stage you had reached by 1995 in the evolution of that service, if I can put it that way.

A. Okay. I'd got my kidney transplant training in Guy's Hospital. I went directly from there to Newcastle and I took with me, as well as the general training that I had, I took with me protocols from my training from Guy's Hospital. So when I arrived in Newcastle, I set up a service in which I produced local protocols, but they were very, very much based on the protocols I'd come across in my training. And I then -- in terms of the purpose of those protocols, essentially in terms of managing my team -- that is to say paediatricians, my junior doctors and the nurses that I was working with -- was that I would use the protocol with them as an educational tool to bring them on board.

My relationship with the surgeons in terms of developing the service was to develop very close relationships with the surgeons to agree and discuss with them the protocol that I was aiming to use and to

agree that we were all happy with that. And then to continue --

Q. Sorry, can I just ask you: when you say "agree we were all happy with that", did they have any input into the protocol itself?

A. There are different elements of the protocol. In terms of elements such as fluid management, they accepted that I was -- that was my area of speciality and I -- they obviously, when we first met, wanted to know that I was a plausible guy and that I would bring along appropriate skills and that they realised that that was an area that I would cover. And they were happy for me to just deal with that. When it came to more shared areas such as immunosuppression, in which transplant surgeons will have very great interest, in those areas we debated the details, although in fact what I set out was more or less fully accepted, but they had a strong input into a discussion on to how we would immunosuppress children.

And in terms of things like our relationship with the surgeons meeting the families, liaising with the families, how we would interact in terms of when children were brought in for surgery, when they were consented for surgery, when they were put on the list, those sorts of arrangements were also discussed. Some of that went into the protocol and other parts of that

were just an unwritten agreement.

Q. How did that work?

A. How did the relationship with the surgeons --

Q. Yes, the involvement with the surgeons at the stage when you're thinking that you'll put a child on to the transplant register right up until the time when an offer is being made. How did that relationship work?

A. Okay. The primary carer for a child in chronic renal failure, in my view as a paediatric nephrologist, is the paediatric nephrologist. Our role as paediatric nephrologists would be to identify children that were progressing into kidney failure or had developed kidney failure which we decided was irreversible and needed dialysis or transplantation. At that point when we first considered the possibility of transplantation, we would discuss it in great depth with the family so that they fully understood the issues and the direction that we were moving in, the sort of events that they'd be facing in the future. Then at that point, we would introduce them to the transplant surgeon.

Now, that took place as a joint clinical meeting, usually on our territory, but sometimes on the surgeon's territory. So in practice, what nearly always happens would be that we would talk to the transplant surgeon privately about -- ask them if they would attend

a clinic with us, give the outline of the case and all the background of the case so that the surgeon would then actually come to the clinic where the parents and other supportive relatives and the child, the paediatric nephrologist, the children's kidney nurse and the transplant surgeon would literally have a combined clinic where we would all discuss the issues. And then the surgeon would examine the child, discuss issues with us and with the parents and with the child, if they're older children, examine the child and then come to a plan at that point with us about timing, whether or not we'd need to use dialysis, what sort of dialysis, what sort of particular issues the surgery might carry with it and so on.

So at that point, we would forge a joint plan.

Q. Sorry, just before we get into the joint plan, when you were having your earlier discussion with the surgeon, when you came back and you were seeing how this paediatric transplant service might be delivered and you were discussing with them the protocols that you were developing, your local protocols, and I think you said part of your discussion is about how they would become involved in this --

A. Sure.

Q. Is that part of what you agree with them, that there

will be meetings -- they've been called multidisciplinary meetings; they don't have to be called that -- that you would wish them to come to and wish them to be involved in --

A. Absolutely. I mean, it's a two-way process. I wanted the system to work like that, but equally, the surgeons -- and obviously there was a lead surgeon then who I had a particular close relationship with. We built the service up together. That lead surgeon also made it very clear to me -- if I had needed it making clear to me -- that he would not be prepared to run a service any other way. He was not a technician, he was a major player in the decision-making about which children would go on call, that he had met the families, he had met the child. His phrase was, "There's no way I am going to operate on a child unless I've put my hand on their belly", but which he meant he had met them, examined them and talked to the family.

THE CHAIRMAN: Doctor, can I assume that this didn't happen overnight when you went back to Newcastle from London in 1985; this is what developed over the following years?

A. Not really, no. It more or less happened overnight to be absolutely honest, in the sense that actually the precise thing that happened was that when I came back, there was a teenage boy who I felt was needing fairly

urgent transplantation and my first approach to the transplant surgeon about that was an interaction in which we forged this relationship.

THE CHAIRMAN: Okay.

A. He made it very clear to me what he would want from me. I had a protocol, he looked at the protocol, he said how he would want to work, and we just -- it happened that we had a very common approach, so we just agreed there and then that's how it would work. And since then it has obviously evolved in a whole number of ways in the sense that, in 1984, he was the surgeon that did all the children's transplants; there is now a bigger team. But the whole system developed and continued to develop along those lines. Initially, it would be a relationship between myself and a surgeon and we would sit down and discuss it -- we wouldn't call it a multidisciplinary meeting, we'd call it a chat -- but as more people became involved, it became formalised.

THE CHAIRMAN: Are you talking about a single surgeon?

A. Initially, I worked directly with a single surgeon, but he was the head of a team and all the surgeons that worked with him and under him worked in that way. And as he -- other people came up and became more senior, that became the established norm and we effectively institutionalised our initial arrangements.

THE CHAIRMAN: Because they followed his lead?
A. Because they followed his lead and because, I suspect, that's what they wanted to do anyway. But that's how it worked, yes.
MR FORTUNE: Sir, while we certainly encourage this line of questioning, can we establish from a Dr Coulthard what he means by "a protocol"? Because we've had reference to guidelines, we've had reference also to an unwritten agreement mentioned just a few moments ago by Dr Coulthard. Could we establish what is what?
MS ANYADIKE-DANES: Yes, we will certainly do that. You're quite right. There has been some discussion about what those terms mean.

When you came back to Newcastle and you knew that's what you were coming to do, did you have any thoughts about how that would work with the other disciplines, primarily the surgeons, or was it simply fortuitous that you ended up forging a relationship with the surgeons?
A. I had in mind that it would work in that way.

I couldn't see any other way that it could work and certainly where I trained, in Guy's Hospital and a Great Ormond Street, that's exactly how the relationship was then. Although in Great Ormond Street, there was no transplantation when I worked there, children in Great Ormond Street were transferred as they reached a point

where they required it to Guy's Hospital and, while I was at Great Ormond Street, I met the transplant surgeon from Guy's coming to Great Ormond Street having exactly that kind of relationship with the paediatric nephrologists at Great Ormond Street. Then as I moved across to Guy's, there they were in that setting.

That was a model that seemed to be an obvious model and it's the one I wanted to follow. So I came back to Newcastle thinking that that was the model I wanted to forge. And the transplant surgeon had the same view.

Q. Were you aware of whether that sort of model existed in other centres where they were carrying out or starting to carry out paediatric renal transplants?

A. I think it -- I'm almost certain that it did so. It's interesting to note that nearly all of the paediatric nephrologists in the UK at that time went through Guy's or Great Ormond Street -- virtually all of them did so -- and it was the model that was taken to be the sort of standard model.

Q. Then just one more question before I do address this issue with you as to guidelines and protocols and so forth. That is the fact that your surgeons, at least initially, were coming from another hospital and on a different site. Did that introduce any difficulty into establishing this arrangement?

A. No. No. In actual fact, right at the beginning in 1984 there was some transplant surgery in the RVI and some at the Freeman and it was being moved across to the Freeman, so I kind of got the tail end of them actually being on site. But in a sense it was irrelevant because the hospitals are only a mile-and-a-half apart and we meet in other academic settings. It was just expected that you would have to have that relationship. The fact there's a mile-and-a-half between you is really irrelevant. That couldn't be allowed to be a barrier to this sort of working --

Q. Well --

A. -- and it never has acted as such.

Q. Sorry. The geographic distance is one thing, but you said those hospitals were under separate management. So did that affect matters, that two management systems had to have a relationship to allow the resources of one to be applied for the service of another?

A. That was never anything that impinged on me at all. The two hospitals and clinicians between the two hospitals have always worked -- you know, that has never been a barrier, as far as I've ever seen, to working. The fact that we then became a single trust, to me, was completely irrelevant because the working relationship was forged between clinicians and the fact that the

management was this or that was not really relevant to us.

Q. Let me take you to the point that my learned friend Mr Fortune has mentioned. You will know that the document that was drawn up by Professor Savage and dated September 1990 has been variously referred -- I think it is referred to as a protocol, but it has been described in other ways. You also have referred to bringing the protocols that you were used to in London and making them applicable to your local situation. And you have referred to that as a protocol.

When Dr Haynes was giving his evidence, and I think maybe Professor Forsythe and Mr Rigg, they talked about guidelines, guidance and so forth and said that there was a very clear difference between guidelines and protocols. From your point of view, when you refer to having developed a protocol, which had some input from the surgeons and this developed over time, what are you talking about? Are you talking about a protocol, a guidance, an aide-memoire for you and your team? What are you talking about?

A. I'm talking about a document which outlines the requirements of the exercise. It would include information about the aims of each part of the -- it's difficult to say this without using protocol and

guidelines in a specific way. It would, for example, give the reason why we would want the fluid management to be as was laid out. It would give the prescription of the formulation that we would use so it would produce that fluid management. It would give the doses of which medications that we would want to give. In that sense it's prescriptive for -- let me start again.

For me as a consultant who wrote the document, for me personally, it was a sort of aide-memoire and it was more a teaching tool so that I would be able to give that document to a junior doctor and I would expect them to follow it. So for them, I suppose it's a protocol, I want them to follow this, I want them to take the bloods I ask, to send them at the appropriate time to the appropriate place and so forth --

Q. Let's --

A. It doesn't mean, however -- and this is my problem with terms like "protocol" and "guideline" -- it doesn't mean that everything in it has to be slavishly followed because there's always an element of judgment in any medical situation. So for example, the antibiotics to give as per the protocol. However, part of your medical judgment will be to discover whether that child had an allergy and then to choose a different antibiotic so that it's -- to me, the terms "protocol" and "guideline"

are often used interchangeably and I'm using them sort of interchangeably.

In terms of its use for the surgeons or the anaesthetist, it would have yet a different role.

Q. What did you foresee as its use for the surgeons and anaesthetists?

A. For the surgeons, when we developed the protocol and adjusted the protocol, it was a formal forum about which we could debate changes. So when I arrived, I wanted to -- I brought with me an immunosuppressive scheme, the surgeons discussed that and maybe we would tweak it a bit and then we would come to a final decision of what we would done. Then a bit later, a new drug would come on the scene and we would change it. So the protocol or guideline is changed according to development and times and having it as a written formal protocol is a way that, in a sense, prevents me, on the one hand, as a paediatric nephrologist, from just making changes without informing people.

So in a sense, it was a way of -- it was a formalised way of ensuring, almost like minutes, that we're in agreement on some of these details. That's how it was used with respect to the surgeons. The surgeons, having agreed it, wouldn't ever look at it on a day-to-day basis.

Q. But they would know about it?
A. They would know about it and we would discuss it at ongoing meetings, "We would like to change the protocol because this drug has come in and we want to introduce this drug, what do you feel?", and we would, you know -- the paediatric nephrology transplant surgeons are a team in terms of those changes and nobody would take a unilateral decision.
Q. In fact, a change like that actually happened here when Dr O'Connor came from Bristol. She brought with her the Bristol protocol -- if we carry on using the word "protocol" because that's what's on the front of all these documents she brought with her. She started on 1 November and, as a result of that and a discussion she had with Professor Savage, they did actually change the immunosuppressant drugs: they introduced or substituted methylprednisolone, for example, which hadn't previously been in the protocol that Professor Savage had devised. Is that the sort of thing that you're talking about?
A. That's exactly right.
Q. That was for the surgeons. For the anaesthetists, what role did you think your protocol had for them?
A. The protocol included in it the principles of fluid management during surgery and some details about how that would be achieved, including the use of the CVP and

so on. Those were embedded in it. I have to say, latterly, after 1995, but just to round this, we subsequently rewrote and updated a protocol with paediatric anaesthetists so that we would have one that they had contributed to in the same way the surgeons did initially with the original protocol. And in 1995, that wasn't the case. We had embedded in it the principles of how we wanted the children to be managed in terms of fluids during surgery, but I never used that protocol as an actual paper document in that manner. I would actually always have a discussion with the anaesthetist about what I required of him or her.

Q. Was that discussion along the lines of the fluid management or the fluids that you had included in your protocol?

A. Yes. The information was in the protocol and the principles and how we would go about making those fluid prescriptions would be in the protocol, but I didn't expect that document to be used by any particular anaesthetist because, to me, that would not be a sufficient form of communication. In those days, protocols were paper, they would be in the ward somewhere, and although they were important to us and we used them very proactively, from the perspective of an anaesthetist who was doing an anaesthetic for us for

a transplant, I would not rely on them reading that as being sufficient communication. I would talk to them about what was in there.

And obviously, it would be available if there was dispute or discussion and they wanted to see the background to is, it would have been available. As it happens, until we actually sat down with paediatric anaesthetists and wrote it in a bit more detail, no anaesthetist ever actually asked me for the document because it was a discussion that we were having. The discussion would have gone much deeper than the document would have provided information on.

Q. So the protocol, so far as you're concerned, would have been no substitute for the discussion you wanted to have --

A. Absolutely not.

Q. -- about the individual needs of the particular patient?

A. Yes. Because -- whereas we had a personal relationship with the transplant surgeons, the lead one and then subsequent surgeons, there would only would be a small number and they would do transplant surgery, they would have views and opinions about, for example, immunosuppression. They were part of what I would regard as a core team.

The anaesthetists -- I'm not diminishing their role

at all, but the anaesthetists, our relationship with them was very different because on any particular -- by their very nature, cadaveric transplants are emergencies, they're unplanned. And by their very nature, you have no idea, when you're writing protocols or planning a child's surgery, who the anaesthetist will be, what his background is, what his skill base is. And so it was beholden on, in my view, the paediatric nephrologist that when a transplant was actually happening, to seek out and discuss the plan for it, the transplant, from an anaesthetic fluid perspective and I wouldn't have relied on either handing them a bit of paper or expecting them to know that such a bit of paper existed.

THE CHAIRMAN: When you said that the discussions which you'd had with the anaesthetists went beyond what would be setting out in writing in the protocol, would that be to the extent that you would have discussed with an anaesthetist what type of fluid might be used?

A. That was also in the protocol, but when I say it would go beyond that, what I'm saying is in terms of detail. I would have a much more extensive exchange with them than -- they would have learned more from a discussion with me than they would from reading my protocol because I would have been more expansive.

MS ANYADIKE-DANES: And what sort of thing are they learning from you, just so we're clear?

A. Okay. From the point of view of the anaesthetic, the paediatric nephrologist is not in any way setting out to talk to the anaesthetist about issues to do with pain relief or sedation or muscle relaxation. Those are areas that are entirely within the expertise of the anaesthetist and not in my expertise. So those areas I wouldn't be interested in discussing with him.

I wouldn't have anything to bring to that. What I would be bringing to that discussion would be how we were going to manage the child's fluids. Do you want me to outline how I'd do that in practice?

Q. Yes, that would, I think, be helpful. Before you do that, are we talking about events prior to and including 1995 and not more recent?

A. Yes. This is up to and including 1995, yes.

There are broadly two components to the fluid management of a child having a transplant. One element is that you have to replace fluid that the child is losing from their native kidneys, from their own kidneys -- so when they go to theatre, they have their own kidneys and they may or may not be losing urine, and that needs replacing. So that's one section. The other section is that you need, at the time of transplant

surgery, to have a child very fluid replete. You want the child to have more fluid on board than an average healthy child would have just running around. You want to make sure they're really well filled. Not excessively filled, but very well filled. So there are two components.

Now, the first component -- I mean it's very simple, really. What we would do is to measure the concentration of salt in the -- sodium in the urine on the child on admission and use that to inform the anaesthetist of what fluid would be the appropriate fluid for that section, for replacing the urine.

Now, there's a -- the minority of children that have a transplant -- the minority of children, the majority of adults, but the minority of children that have transplants -- don't pass urine at all. So that bit for those children is very simple. They don't need any fluid replacement. Most children going to transplant surgery have their own native original kidneys produce large, typically -- moderate or large volumes of urine, which is of fixed concentration. Their kidneys are able to produce urine, but they're not able to flexibly regulate it in the way that healthy kidneys are.

Q. Does that mean that most of them are more like Adam or not?

A. Yes, he would be typical. I have to say that, as it happens in Belfast, there is a condition called congenital nephrotic syndrome which is a genetic condition which happens to be a bit commoner [sic] in Belfast than in the mainland and those children actually come to end-stage renal failure without any urine. So they're an anuric group. So they would be a bit more represented here. It might be even numbers here. In the rest of the UK, the majority -- a clear majority of children coming to transplantation -- will have an urine output which is an inflexible or a fixed type. And I don't know the figures here exactly, though I have actually been involved with studies involving Belfast, and I think it's about equal numbers that come.

So essentially, you measure the concentration of salt in the urine, then you know what concentration it's going to be coming out at because it's kind of fixed, and then you can replace it with the nearest convenient intravenous fluid or make up a particular fluid. In practice, as it happens, the vast majority of children who have end-stage kidneys, ie kidneys that still work but aren't doing enough work and have to be transplanted, the majority of those children have a urine concentration of about sort of 70 to 90 millimoles per litre. That's the concentration of salt.

And that happens to be approximately half the concentration in your blood. There is a solution called half normal saline which contains a sodium of 77 millimoles per litre, which is approximately half that in the blood, and so the majority of times, if you had a child like Adam, what I'd be saying to the anaesthetist is, "This child passes about 60 ml of urine an hour and it's equivalent to half normal saline, so that's what I would like you to use; okay?" So that's one element.

The other element is to talk about the CVP and fluid management for that. Now, that's kind of -- from my perspective, it's kind of quite interesting historically because, in 1984, when I first came back to Newcastle, I came back understanding that what you needed to do was to regulate the amount of fluid that you gave according to the child's CVP. That was what I was taught. I had actually assumed that that's how all kidney transplantation was done, but I discovered when I first started doing it in Newcastle that the anaesthetists were not aware of that because the adult transplant team in 1984 in Newcastle didn't use CVP in that way. They managed the fluid balance of their adult patients by other clinical judgments. And I have to say that's considerably easier in adults than it is in children

because of the -- because the precise nature that you ... You need to be much more pedantic and pernickety about fluid management in small children because it's very easy --

Q. There's not a lot of latitude?

A. Yes, there's not much flexibility on that. So in 1984/85, up to about 1990, when I asked an anaesthetist to anaesthetise a child for a transplant, I would be saying, "Right, we need this much fluid". I wouldn't say "we need", I would say," This child produces 65 ml an hour [say]of the equivalent of half normal saline, so that's what I'd suggest you use for that. We want this child's CVP up to 9 or 10 at the end of the procedure", and they would say, "What? You want a CVP?", and you would then have to go through and explain the rationale. It's all very simple, it is very straightforward why you would do that, it makes complete sense, but it was a new thing then for transplantation in terms of adults. So for -- most anaesthetists wouldn't have come across using it in that particular format. So in those days I had to explain it in great detail. That's why I was saying much more detail than would just appear in the protocol.

By about 1990, the adult physicians had also adopted the same approach and so, much more frequently by the

time you were getting to 1990, if I spoke to an anaesthetist, I would say, "I want the CVP to be whatever", and they would say, "Sure, in adults we tend to get it to 7 or 8", or whatever it was, and we would have a discussion about the detail but there'd be no discussion about the principle of it that you would want their CVP up and you would get it there by fluid expanding them, by giving them volume. And then -- and certainly by 1995, that would be what would be expected.

Q. But in this case, Dr Coulthard, Professor Savage had the benefit of a consultant paediatric anaesthetist, Dr Taylor. That's what Dr Taylor's discipline was.

A. Sure.

Q. So in 1995, he would have understood about the need for measurement using CVP?

A. Yes.

Q. So if you fast forward a little bit from where you were. You were at 1990, when the anaesthetists were just beginning to embrace that both in their adult practice and presumably in their paediatric practice.

A. Yes.

Q. If you fast forward to 1995 then, what is the level of detail of the discussion that you're having with the anaesthetist about the fluid management whilst a child is in the operating theatre?

A. In a sense, the discussion is exactly the same. Certainly the bit about the urine replacement because that would be something that the anaesthetist maybe wouldn't be especially familiar with, that concept of, "This is how we work it out". But it's very straightforward. The second part, I would then start saying: we want a CVP -- in actual fact, there is an element here, without being too sort of touchy-feely about it, there's an element here of respecting other professionals' knowledge and information. And I wouldn't want to go to an anaesthetist and suggest he was starting from a different position. What I would do is say: we want, obviously, a CVP line, we will provide you with a CVP line. So we would send a child to theatre with the central line that we wanted because we had different sized ones for different children and it would save the anaesthetist scrabbling around finding the particular one. And we would then say, "We want you to run a CVP", and if they said, "Yes, that's fine. What pressure are you aiming at?" That would be one conversation. If I met somebody who raised their eyebrows and said, "You want a CVP line?", I'd go back to my 1984 situation.

That is why a conversation is much better than protocol. By a conversation, you can gauge whether

somebody has a full understanding of your requirement and, at the end of it, you would know that the anaesthetist would know you want a CVP, why you want a CVP, and what you want the pressure to be by the time the surgeons have reached the point that they're ready to connect the kidney to the blood flow.

Q. And release the clamps?

A. Yes.

Q. And would you know also the approach that the anaesthetist is going to take to manage those fluids?

A. We would ask them to "fill them up," meaning give enough volume to the child -- fluid volume to the child -- in order to achieve that CVP. I wouldn't -- going beyond that would not be necessary with an anaesthetist. An anaesthetist would know what that meant. They wouldn't be fit to be an anaesthetist if they didn't know what that meant, that essentially what one is saying is: give plasma or saline in order to expand the child's volume in order to achieve a particular CVP. I wouldn't actually expect to tell them which fluid to use for that because there's no choice.

Q. Except you have indicated that you would be suggesting Hartmann's in relation to the replacement of urine.

A. That's very different because that is a particular estimation that is something that we're very used to

making. If you are dealing with a patient, child or adult, who's got normal kidneys, then the degree of precision as to whether you give exactly this fluid or that fluid is nowhere near as important because if an anaesthetist chose to give half normal saline or normal saline or fifth normal saline in particular circumstances, what a child with a healthy or normal kidney would do would be to excrete urine in a particular way so as to compensate for that.

For example, if a child got a normal saline instead of half normal saline to replace the urine, that would tend to accumulate more salt in the body. If they had normal kidneys, they would excrete that salt, no difficulty whatsoever in the same way that you and I excrete salt after we eat a bag of crisps. So you don't then have to be so prescriptive. The thing about anybody with kidney failure -- but in my speciality, the thing about children with kidney failure, by definition, is that by the time is kidney's at end stage, it's not able to perform as it should do, and that includes that it is not able to perform flexibly and make adjustments to the urine volume and the amount of salt in it, so you have to take over that regulatory role. Although that's kind of obvious and fairly simple and straightforward, perhaps if you're an anaesthetist doing

95 per cent of your anaesthetics on patients who have normal kidneys, it's kind of helpful to remind them about that at the time.

So that's why I did that. I would say, you know -- I wouldn't be taking the view that I was teaching them: that's how you do it. I'd be saying: I've saved you the trouble of working that out and, in this child's case, it's half normal saline that you want. Maybe it was jogging them a bit, but that would be its purpose. When it comes to giving volume to expand a child's vascular compartment, there will be no need to debate that.

Q. Thank you.

MR FORTUNE: Sir, before we leave this aspect, could we clarify with Dr Coulthard something he said a moment ago:

"When we [the nephrologists] send a child to the anaesthetist with a CVP line."

Does that mean that the child has the line already inserted? If so, is that done by the nephrologist? Or is it physically the case that the line goes with the child for the anaesthetist to place rather than having the anaesthetist looking round the theatre and getting the runner to find the line?

A. It's the latter. We would have a favoured particular

line of a particular diameter and length that we would like them to use and we would send that with the child so that when they put a central line in, they not only didn't have to scrabble around to find the right one, but we would know that they would have the one that we wanted.

MS ANYADIKE-DANES: Can I one question in that sort of area? If you, as a nephrologist, knew that the child had had a number of central lines -- which I think from your reports you said is quite often the case when children reach this stage, that they've had a number of procedures that have involved a number of central lines and sometimes, maybe, the patency of their vessels is a little difficult to manage with a central line -- is that likely to be part of a discussion that you'd have with the anaesthetist?

A. Yes. We would say that they'd had a number of central lines, yes. To be honest, that's almost the norm. There will be very few children that would reach end-stage renal failure and require a transplant that didn't -- hadn't previously had several central lines.

Q. Yes, normal for them, but when you were discussing, for example, the way in which you would address the fluid to deal with the particular sodium concentration in the urine passed by this particular child, you said that may

be something that the anaesthetist might not appreciate because they may be more familiar dealing with children with normal kidney who wouldn't have that particular problem. So if you have anaesthetists who are not doing that many paediatric renal transplants, they may be not as familiar as you could be with children who have that particular difficulty. Is that part of what you'd be discussing?

A. Yes, it would be.

Q. Maybe we will deal separately with multidisciplinary meetings, but since we're here anyway let me ask you it. When you're having those meetings -- and I think, at one stage, you said you'd formulate a plan -- we might come back to that -- is that sort of thing about how you're actually going to deal with the transplant of that child, is that a part of that plan and would it go down to the detail of what condition their cardiovascular system was in and how easy or not it might be to manage matters?

A. Yes.

Q. Is that part of what you discuss?

A. It would be, but I have to say the position of the central line would not be a major part of that discussion because the majority of children that go to transplant already have had multiple lines. And

1 although it does make it more difficult, the fact
2 is that that's how it is. In the years that I have
3 practised, I can only remember one or two children where
4 it actually created a major difficulty and we've had to
5 use a femoral line. So although this is the case and it
6 does make it more difficult, it's usually not
7 insurmountable.
8 The only children where you really anticipate
9 a major problem is where children have had a special
10 event -- for example, if they've had a major thrombosis
11 as part of a previous illness or something like that --
12 and then one would know about that because of their
13 clinical history. If their clinical history is simply
14 that they've had four or five central lines, that would
15 be part of the anaesthetist's package and you would warn
16 them they've had four or five central lines and the last
17 one was on the left or whatever it was. And you'd
18 expect them to cope, despite that.
19 Q. Thank you very much. I am going to come back to these
20 multidisciplinary meetings and things that you would
21 discuss, but since we were in that territory I thought
22 I'd ask you that question.
23 If we come back to the actual protocol, in fact the
24 actual protocol is to be found at 002/2, page 52. At
25 least the first page of it is. That's the actual

protocol which I'm sure you've seen in the course of preparing your reports.

A. Yes.

Q. The Bristol protocol, just so that we have it -- maybe we can put it alongside -- is 002/2, page 64.

If we keep then turning in parallel, the immunosuppressant can be found on the left protocol, which is the Belfast one, at page 53. If we turn to that one. That's the immunosuppressant.

In terms of the Bristol one, the immunosuppressant there, I think, can be found at 002/2, page 65. Maybe we can enlarge paragraph 7 there.

The evidence has been that when Adam went into surgery, Dr O'Connor and Professor Savage had discussed the immunosuppressant and what they were going to use is methylprednisolone, which you see at paragraph 7 from the Bristol, as opposed to the immunosuppressant that you see at paragraphs 2 and 3 in the Belfast one.

A. Mm-hm.

Q. What Dr O'Connor said was she went in initially to the theatre -- she was going to go in from time to time anyway -- but she went in initially, partly to clarify matters. I'm not going to bring it up now, but the reference for it is her evidence on 25 April, and you can find it starts at page 58, lines 15 and 16.

She was concerned that the anaesthetist should know exactly what immunosuppressant is to be used. Do you have any comment about having to go into theatre for that purpose? Did it cause an element of confusion or not? Not her going in; the fact that they were using a part out of one protocol.

A. Right. I'm not sure quite which of the questions -- I've got a couple of questions. I'm not sure which bit of it you're asking me. Are you asking me am I surprised or confused about the fact that they made a relatively last minute change or are you talking about the fact that she went into theatre to --

Q. You can answer the first one.

A. The first one I think is fine. I think that represents a discussion between two professionals where hydrocortisone intravenously is a form of steroid, methylprednisolone is a very parallel steroid. There would be a debate between them. They are, in many ways, almost interchangeable. There are reasons for choosing one over the other. I can imagine that that is the sort of thing that would occur as a result of a discussion between two professionals and I think the fact that that was discussed just prior to the transplant seems entirely appropriate. I've no problem with that at all. I think that's fine.

Q. Okay.
A. It's changed -- the fact that what they're doing is different from what's written in their protocol is entirely acceptable. That's why I was kind of referring back in the earlier question about protocols and guidelines. The information is there, you have to give an intravenous steroid and they -- but you are not hidebound by following the precision of it. You can then use that as guidance and you can discuss which is the right one.
Q. Can I ask you this though: who actually administers it?
A. I can tell you exactly what happens in Newcastle, and I'm sure the same arrangements will apply. Having made the decision of what drug you're going to use and the dosage, that would be written up, but the -- our protocol would actually state this, that the doctor looking after the -- the paediatric nephrologist or his representative, ie me or my registrar, would write up on the drug sheet going to theatre the dose of the drug, the name of the drug and the route of administration. So you would write up, for example: intravenous methylprednisolone -- if it's 10 per kilo they're using -- 200 milligrams and the time of administration, which would be at release of clamps. So the prescription would be written by a doctor and if it was

written by a junior doctor, I would anticipate always in this situation that it would be double-checked by a consultant before the child went off. So the child would go to theatre with a drug sheet which would have that already prescribed, including the time. There would be no debate from the perspective of the people in theatre as to what they're meant to be giving because it would be what's written on the sheet.

Not only that -- in practical terms, again really just to make sure things run ultra smoothly because you get one shot at a kidney transplant. To make sure things run really smoothly parallel to our sending along a line, we would also, in fact -- and it would be in our protocol that you'd ask the ward nurses to obtain that. In practice, we very often got them to mix the solution -- it comes as a dry powder -- so what is delivered to theatre is the child, the drug sheet and the drug, and the timing of it is written on the drug sheet. So it then becomes the anaesthetist's job to ensure that that prescription is carried out.

So the anaesthetist would want to know from the -- he would be knowing anyway because it's a crucial part of their interaction -- but he would want to know from the surgeon when the clamps are coming off because he would actually deliver that at the time.

Q. So we're clear: there'd no need for a nephrologist to come in and check that? In your hospital, the prescription is there, in fact more than that, the actual drug is there --

A. Yes.

Q. -- which is to be administered in accordance with the prescription. So the fact that some other immunosuppressant drug might have been on the protocol is neither here nor there because they will be adhering to the actual prescription that is made for that child on that day?

A. Exactly.

MR FORTUNE: Can we assist Dr Coulthard by referring either to 058-035-133 or the same document at 059-006-011? Because it's Professor Savage's management plan that is set out. There it is.

THE CHAIRMAN: 133.

MR FORTUNE: If Dr Coulthard casts his eye down a third of the page:

"In theatre to have."

And you'll recall that the evidence is that the methylprednisolone had to be obtained specially, to be brought into theatre, for it to be infused by the consultant anaesthetist.

MS ANYADIKE-DANES: Yes, absolutely. I think that what

Dr Coulthard is saying is that that prescription would be written up and the drug would accompany the child to theatre. My understanding -- it may have been a slight refinement on the way Dr O'Connor put it -- was that she was going to have to go and get it and she was concerned to make sure that there was no misunderstanding on the part of the anaesthetist because they had slightly changed the immunosuppressant regime. I think Dr Coulthard's evidence is that there shouldn't be any misunderstanding because there's a prescription and, better yet, there's the drug in his hospital.

MR FORTUNE: And also at the time that the drug is administered, in other words before clamps are released.

MS ANYADIKE-DANES: Exactly.

A. In terms of the relationship between the anaesthetist and the use of the protocol, I would not be expecting an anaesthetist to be confused by that at all, even if ... You know, it is not their role. Their role is not to decide which immunosuppressive drug to give. In that case, they're doing almost a nursing job of administering something that has already been written up by another doctor.

Q. Yes.

THE CHAIRMAN: Is there evidence that Dr Taylor was confused by this?

MS ANYADIKE-DANES: There was no evidence from Dr Taylor. It was Dr O'Connor's evidence.

THE CHAIRMAN: Yes, but --

MR UBEROI: [Inaudible: no microphone].

THE CHAIRMAN: I'm not sure where we're going with this because there's no evidence. Professor Savage has described it, he has said when it should be given and there's no suggestion that Dr Taylor somehow became confused. And you wouldn't expect him to be confused because --

A. No.

THE CHAIRMAN: -- he has the note and if Dr O'Connor comes in to confirm everything's fine, that's not what went wrong.

A. I agree.

MS ANYADIKE-DANES: Although in some of the statements it has not been entirely clear as to who administered it. There seemed to be some suggestion that the nephrologist has to be there for it to be administered. But in fact, in the way that Dr Coulthard has clearly put it, there's a prescription, the drug is there, and all that the anaesthetist has to do is follow the prescription, effectively.

I wonder if I could ask you just one final thing in relation to your protocol, and that is, I think, when

you were talking about it, you said that it was something very much for your team as well as it being of benefit to others, and in the team you included the nurses?

A. Yes.

Q. How do the nurses get to know about it, about your protocol?

A. The nurses -- there are two different sorts of nurses that I'm referring to. First of all, there are paediatric renal nurses. That is to say, nurses who are part of the core members of the children's kidney management team. Those nurses are party to all of these discussions. They would have been party to writing the protocol and they would have been party to all the practical arrangements that we would make about the protocol. They would be an integral part of writing the protocol. So they would know about it by being part of the core team.

The second group of nurses would be the nurses on the ward where the child is admitted. The protocol itself would be -- copies of the protocol in those days would have been lodged on the ward in a file and as part of the nurse education system, the renal nurses, the children's kidney nurse specialists, would also attend the ward, attend ward rounds and would teach the key

nurses on the ward about it. So there'd be a general awareness that there was a transplant protocol and I would then ring the ward and say, "I've just had a phone call, and we're thinking about a kidney for somebody or other", the nurses would get that child's notes, get the information and get a protocol sheet and they would read it. But we would always -- I mean, kidney transplants are not happening every day in children and the protocol would be read and discussed by the junior doctors and the nurses as part of a team. They would sit there and say," What do we have to do here?" They have to admit the child, they have to do this with the dialysis, take these bloods and so on. So it would be a guide to what was in front of them and they would be very actively reading it. In practice, they would actively read it.

Q. In those early days -- up to, say, 1995 -- when you were developing your service, did you have team meetings when you'd actually discuss these things?

A. Yes. Yes, we did. The system that we ran for paediatric nephrology is that we had a meeting, a weekly meeting. There are umpteen sorts of multidisciplinary type meetings, but this multidisciplinary meeting that we had, we've always had ever since I started there, again becoming more formalised in its approach.

We would have a meeting every week in which we'd go through the details, pertinent details, about children that had been seen in the clinic, children that had had transplants, children that were awaiting a transplant, any child that had been brought to our attention through some clinical activity that week. And that team meeting would consist of the paediatric nephrologist, paediatric renal nurses -- or nurse, at the beginning -- dietician, social worker and a ward nurse.

Q. I think Professor Savage referred to meetings composed very much like that.

A. So in those meetings, for example, if you had done a transplant on a child and the following meeting you'd be discussing how it had gone and the details and any difficulties with the way the protocol was running would be brought up there. For example, if there was an issue for the ward nurses that we hadn't anticipated that they didn't have enough methylpred on the ward and had to go and get some from somewhere, we would -- you know, the minor details. You would iron out future plans. That meeting was in order to share the details of protocols, if you like, and make sure they ran smoothly in future.

Q. And would you be surprised if any of those nurses or junior doctors would say, in your time, if I can put it that way, that they actually weren't aware of the

protocol?
A. They would all have been aware of it. I would have been very surprised. That would have been an unacceptable remark if they were working on the team and didn't know about the protocol --
Q. That would have been unacceptable?
A. -- where were they? Yes. It's a key document in relation to the child's actual clinical management. I mean, just to say what physically happened with the protocol is that when a child came in, their actual -- one of the copies of the protocol -- it wasn't a protocol you kept and you got one out and put their name on it and where it says, for example -- we didn't use this particular dose -- but if it said "methylpred 10 milligrams per kilo", then you would write next to it the child's dose. This is why I can see why Professor Savage uses the term "aide-memoire". It kind of summarises all your management issues on one -- in one document and you actually put in the child's weight, the child's -- even if it's somewhere else in the notes, as a convenience, you'd have weight, height, surface area, drug doses and so on.
Q. So it'd be personalised for that child?
A. It would be personalised and it would go with the child's notes and stay there.

Q. Thank you. You, I think, have discussed one way or another, much of what I wanted to ask you in relation to the multidisciplinary meetings. There's just one issue that I don't think you have covered, but you dealt with it in one of our reports. 200-007 and you address it at pages 113 to 114. There you say:

"The final decision to plan to undertake a transplant should not be made by the paediatric nephrologist alone, but jointly by the paediatric renal team and the transplant surgeons."

What I wanted to ask you about is the multidisciplinary meetings that you have talked about and talked about how they evolved and gradually became more formalised and so forth, that's you in Newcastle. In your knowledge of your colleagues elsewhere, were such meetings common practice in the rest of the UK in 1995?

A. Which meetings are you talking about?

Q. Multidisciplinary meetings.

A. The multidisciplinary meetings of the type I've described?

Q. The ones that would involve the surgeon.

A. Okay. I would assume that they would be commonplace because it seems to me mandatory if you're going to put a child on call for a transplant to involve the surgeons

at that point. We actually have -- there's actually -- it may be better if I just outline three types of meetings. The multidisciplinary meetings that we talked about weekly is one sort. A second meeting is the actual clinical meeting, that's a clinical -- a clinic visit that I described earlier. I would consider that as a clinical meeting, if you like, where you're actually meeting the family and the surgeon together. That, I would be sure, would happen everywhere. I'd hope so.

Q. In 1995?

A. Oh yes. I went from my -- that's how I was trained in 1984. So I took that to Newcastle and I think -- I can't see how you could run a team like this safely and effectively without doing that.

The third sort of meeting -- I don't know if it's relevant to mention it now -- is that, in addition to the meetings with the surgeons, by the fact that the child is needing a decision making is we'd have regular much less frequent meetings -- now they're about every two months, so perhaps every three or four months at some stages -- where you'd have a meeting which involved paediatric nephrology, doctors and nurses, transplant coordinator, transplant surgeon and immunologists -- that is to say the team from the

laboratory that does the cross-matches; okay? And you'd have regular meetings with them and you would go through a list of all the potentially -- potentially, all the children on the waiting list and all the children who have had a transplant.

Q. In 1995?

A. Oh yes, yes. What you would then do would be -- the children that are just stable with transplants, of which there are dozens at any point in time, you wouldn't really -- you'd only raise issues about ones where there's a problem. Any child that had had a transplant that was having a problem you'd discuss, every child on the waiting list you'd discuss. Because you might put a child on the waiting list at a point in time where his dialysis is going fine, the parents are coping, everything is satisfactory and maybe there's an issue down the line that the dialysis is becoming problematic. That will alter the relative urgency with which you have to transplant the child. So those meetings would be to review changes that had occurred that might affect the surgery, changes that occurred that might affect the cross-match decisions, changes that occurred that might affect their medical management. So we would share those and mostly you'd tick them through, but there would always be one or two children where there would be

a review of the plan because, for example, the dialysis was not working or the family were getting too stressed and couldn't handle the dialysis any longer and you just say, "We've got to get this child transplanted".

Q. What's in the plan?

A. What you'd do is you'd consider factors like how well the dialysis is going, what their biochemistry is doing.

Q. Sorry, those are factors you'd consider. What is in the plan, what's in the plan?

A. What we then decide is, number 1, is there going to be any change in the way you undertake the surgery? For example, if we've brought to that meeting that we've had to do another urological procedures, the transplant surgeons might say, "Hang on, we're going to have to think about which side we plumb the kidney into", that sort of technical thing. Much more commonly it was about what sort of kidney you would accept. So you would say if you had a child who was doing really, really well on dialysis, the family were coping, you would then say: we will hold out to get an extremely well-matched kidney. It may be we accept the fact that it may mean this child would then wait a year or two or three, but that would be, on balance, worth it because we'd get a really good kidney.

On the other hand, if the same child then lost their

peritoneal dialysis for various reasons and it was a big struggle to dialyse them at all, you might say we will no longer go for that, we will accept a poorly matched kidney because if we don't accept a poorly matched kidney, we're not going to get a kidney in time. Those are the decisions -- it's essentially the degree of urgency and the laboratory, the role of the laboratory people in that, is to interpret for us in any particular child whose particular tissue type they would know. They would interpret for us the frequency of that tissue type and how relaxed we had to be in that particular case.

Q. Can I just ask you a question now that you have mentioned the laboratory and resources and facilities? In this case, there were two laboratories. At one point, the Children's Hospital had its own biochemistry laboratory service, and that operated, so far as we understood, office hours, 9 to 5. Outside those office hours, the biochemistry lab work was done in the main laboratory. But the evidence that Professor Savage gave -- and he gave that on 17 April and I think the reference for it is page 18, starting at line 14 and going on to page 19 at line 20. The evidence that he gave was that he thought that the biochemistry laboratory service for the Children's Hospital was

withdrawn before Adam's surgery and provided from the Kelvin site. And that is where the biochemistry tests went. We see that from page 18, lines 16 to 22.

Then he went on to say, at page 19, lines 17 to 20, that:

"Certainly around that time the Children's Hospital biochemistry facility was withdrawn. There was still a haematology facility because of the oncology service."

And Dr Taylor said much the same sort of thing. His evidence was on 20 April. And at page 43, starting at line 2 and going on, he said, effectively, that the children's biochemistry lab had stopped due to quality control reasons. Then he went on to say:

"There was really no point in doing a blood sample if you couldn't rely on the result."

In fairness to all of that, the DLS has presented a slightly different view in a letter that they sent to the inquiry when we were asking about the laboratory facilities. Their letter is dated 3 November 2010. It starts at 301-018-330. Then the particular part is actually 332. If you look at the paragraph starting at 12 it says:

"In 1995, all out of hours blood tests in clinical biochemistry were available and done by an on call MLSO. In 1995, the paediatric clinical biochemistry lab was

still open 9 to 5 at the Children's Hospital, but after 5, the requests would have been analysed in the main laboratory in the Kelvin building."

Then it goes on to say how the requests were received and responded to and turnaround times and so forth. But the point that I wanted to ask you is: it doesn't, in terms, say that at the time of Adam's surgery the biochemistry lab for the Children's Hospital was in operation. It simply says "in 1995". If Professor Savage and Dr Taylor are correct that, in fact, by the time of Adam's surgery all biochemistry tests were being sent off down to the main lab, the point I want to ask you is whether you think that in delivering a paediatric renal transplant service they should have had a conveniently located lab for the operating theatre for the Children's Hospital that could accurately provide results for biochemical tests.

A. Okay. The first point -- there are a number of points in that. One point is that there is no point at all in having a laboratory that produced results that you can't rely on.

Q. Yes.

A. You included that as part of your question. You have to have something that you can rely on and that is accurate. The second thing is that the local

arrangements -- I don't know where the particular site is in relation to the other site -- are not really what matters. What matters is the turnaround time.

Q. Yes. It has an effect on that. That's what I'm putting to you.

A. Yes, sure. But how they actually deliver it is -- what matters is: is there an adequate turnaround time?

I mean, the --

Q. I can help with that.

A. The letter here says that it would certainly be less than 90 minutes and probably less than 60 minutes and they talk about it being no more than 40 minutes for routine tests and so on. You have to -- there is no ... It's not appropriate to undertake procedures such as kidney transplantation in children unless you can have relatively urgent, accurate biochemistry results. You would certainly have to have them back within an hour and it would be preferable to be quicker than that.

Q. Yes. Actually, Dr Taylor dealt with that in his evidence. I think his evidence was on 20 April and I think it starts at page 41. But in any event, his evidence was that if you are talking about an out-of-hours request, which when Adam's surgery started would have been out of hours as he went to theatre at 7 --

A. Yes.
Q. -- and it seems that knife to skin was at or about 8 am -- that would have been out of hours as far as we have been told -- that if that happened, you were dependent on, if not one, certainly very few porters who serviced the entire site and whether or not you had your porter come quickly rather depended on what else he was doing and where he was in relation to your operating theatre, I think was his evidence. So he said, I think at page 41, line 4:

"It could be 30 minutes to two hours."

Depending on, I think, where your porter was. So what I'm -- in fact, we have an example -- also for Adam -- of how long such a test took. Blood was taken in the theatre round about 11.30 --

A. Mm.
Q. -- for a laboratory test. And that was returned round about 1.20. That's the result of 119 millimoles. And we have the -- if we look at 058-035-138. There we are. Oh. For some reason that highlighter has acted as a redacting. If we look above there, do you see "1.20"?
A. Yes.
Q. And then just below there by "27 November 1995", what is actually blacked out, regrettably, is the 119 millimoles. We have the originals here and we'll be

able it to see that. I don't think there's any dispute that that's what that is. So that is coming in after that note was written up. So if one takes it at roughly 1.20, that's what I'm asking you, for your observation on a situation where Adam has blood taken from him at roughly 11.30. He's in theatre, obviously someone wants to know what his biochemistry is, the anaesthetist, and it takes that along. Of course, by that time he's in paediatric intensive care. Your comment on the length of time.

A. I would consider that unacceptable. I would consider that degree of service unacceptable.

THE CHAIRMAN: You have said that you need the results within an hour, if not less.

A. If not less. What I would want is to expect them all to come back within an hour. But in reality what happens if you're really worried about a child, if you've got some indication that you've got a seriously abnormal result or the possibility of so, you would expect to phone the laboratory and make sure to get it back within a quarter of an hour. That's the kind of times I would expect: half an hour at the outside and an hour to be the maximum ever if you're sending it from theatre. Two hours is not acceptable because things change so quickly as we've seen in Adam's case. But it's not untypical of

managing small children. Things happen quickly and you need services better than that.

MS ANYADIKE-DANES: In terms of the location, everybody has seen the site plans. I'm not proposing to take people to that now. You'll see when you look at them -- they're on the website -- that the actual location of the laboratory which previously was able to provide biochemical results was literally round the corner from the operating theatre, whereas it is some distance to go for the main lab. That probably has or possibly has some effect on turnaround times. But in any event, as you say, the important point is not where the thing is located, but actually what your turnaround time is and you have expressed your view as to what you think would be acceptable and unacceptable.

THE CHAIRMAN: I've got the point.

MR FORTUNE: Sir, before we move away from this topic, can I just deal with two matters and seek clarification for your benefit? My learned friend asked Dr Coulthard in relation to the second type of meeting, the clinical visit. Dr Coulthard said:

> "I assume that such meetings were taking place at other centres."

THE CHAIRMAN: I've got that, yes.

MR FORTUNE: Could we find out from Dr Coulthard whether he

visited any other centres and specifically asked if such a meeting was held on a regular basis?

The other matter --

THE CHAIRMAN: You're looking for the basis of his assumption?

MR FORTUNE: I am, sir. The other matter raised by Dr Coulthard, which I'm having checked, is he referred in his hospital to dozens of patients on the transplant list at the time with which we are concerned, 1995. I have been looking at the transcript and, as far as I can find, for Professor Savage -- 17 April, page 21 at line 17 -- there's a reference to ten patients. I also have a recollection that there were, at most, about 20 patients within the unit awaiting transplant. So how big was Dr Coulthard's transplant number by comparison to Professor Savage?

THE CHAIRMAN: Okay. Let's take the two points.

Your assumption, doctor, that the multidisciplinary team meetings that you'd referred to, the second sort of meetings involving surgeons, that they were commonplace in 1995, effectively in Great Britain, beyond Newcastle. What's the basis for that assumption?

A. The basis for it is that in my training in London, they happened. They happened at Great Ormond Street even though there's no transplantation there, but that

liaison went on at that point --

THE CHAIRMAN: That was ten years earlier.

A. Yes. And at Guy's Hospital, they were a regular feature. They're based on that. They're based on the fact -- my assumptions are based on the fact that most of the paediatric nephrologists in the UK were trained through those centres and they're also based on my discussions with paediatric nephrologists at meetings over the years. I think it's perhaps useful to recall that there are -- that when I was a paediatric nephrologist, there were about 25 or 30 paediatric nephrologists in the UK who met regularly at meetings and the way that we ran our services was regularly discussed.

THE CHAIRMAN: Was Professor Savage one of that group?

A. Oh yes, yes.

THE CHAIRMAN: But --

A. I haven't specifically -- I couldn't specifically tell you that I know that any particular hospital or a majority of hospitals did it like that.

Finally, my assumption is made on the basis that I cannot imagine how you could run an effective transplant service if you didn't have that sort of relationship. That's very much a supposition.

THE CHAIRMAN: I think the point perhaps which is being made

is whether that is the sort of meeting and the frequency of meeting to which you would aspire if -- if you all train in London and then scatter back to Newcastle or Belfast or wherever else from London, you know what you're aspiring to, how quickly you can get that up and running and get things in place, depending on what local pressures and local resources are.

A. Well, that's true if you're envisaging the meeting as a formalised set of arrangements. But paring it down, the clinical meeting involving the individual child and making a plan for an individual child is a meeting actually between two colleagues and a family. I cannot think that you could proceed and put a child on the transplant list without doing that and not slip up and make mistakes. So that's -- I cannot see ... And that would not require formal organisation.

THE CHAIRMAN: Well, I think the evidence seems to me, over the last few weeks, is that it's accepted by Professor Savage that the surgeons weren't involved. No surgeon was involved at the time when Adam went on to the transplant list. There's an agreement from him that it would have been better if that had been the case and things have moved on since then. So the service in Northern Ireland which was developing -- perhaps a little bit behind your service in Newcastle -- hadn't

yet got to the stage when the multidisciplinary meetings -- some of which were taking place -- involved surgeons. You think that it clearly would have been better had they involved surgeons at that stage.

A. Very much so.

THE CHAIRMAN: Okay. The second question you were being asked was in terms of the comparative size or the comparative numbers of transplants being done. I think the difference here is between the number of children on the transplant list and the number of children who actually had transplants.

A. Two things. One is that actually the numbers of children -- Newcastle serves a population of 3 million. I know that Northern Ireland is smaller than that. That's the first thing. The second is that when the question arose about me using the terms "dozens" -- it'll obviously be in the transcript and I may have used it incorrectly -- what I was trying to convey is that when you look at the entire transplant population which include all the children who have had transplants and now have a stable transplant, all the children who are waiting to have a transplant and all the children who have had a recent transplant, that comes to dozens, okay? It certainly came to dozens in 1995.

Amongst those, there would be a few that were on the

waiting list, a few that had just had recent transplants. I wasn't trying to imply that there were dozens on the waiting list. Our waiting list was probably about the same size as Professor Savage's. I don't think we ever went much higher than that. The size of your waiting list, like the length of a queue to get into a car park, depends a bit on throughput and all the rest of it. So you can't necessarily equate population size and waiting list size.

But the "dozens" that I was referring to was intended to -- if I said it wrongly, I apologise. It was intended to convey the whole transplant population that both the surgeons and the physicians were looking after.

THE CHAIRMAN: Thank you. Let's give the stenographer a break and we'll return at 11.55.

(11.41 am)

(A short break)

(11.59 am)

MS ANYADIKE-DANES: Dr Coulthard, just before we broke for that break, you were being asked about numbers and you were explaining what you meant by that. I'd like to ask you another question in relation to numbers, and it really arises out of an observation that the chairman made in the course of Professor Savage's evidence on

17 April. It starts at page 66, line 22. Then it goes on to the next page, up to about line 6.

The issue was the comparatively small number of under-fives being transplanted in Belfast. 17 April, page 66, line 22. If we start there, you need to go perhaps a little bit above that to see the answer that Professor Savage gave to get the context. He says at line 6:

"The small children that we transplant tend to fall into two clinical groups. One is a group [that you have identified] with a condition known as congenital nephrotic syndrome and they tend to go into kidney failure around the age of two and that's why I'm saying I can't remember exactly, but certainly at least three of the four would have had congenital nephrotic syndrome and they have virtually no urine output by the time they're transplanted. The other major cause -- and I think you'll remember Coulthard has said that some 60 per cent of children requiring a transplant have dysplastic kidneys and they are likely to be polyuric. But the reason that there are so few is just that there are so few. Any child that needs dialysis or transplant in Northern Ireland receives it. It is just a feature of the population base."

The chairman goes on to say:

"Question: What I was getting at was, accepting 31 is a comparatively small number of children, only four of those were over six. So most of them are obviously between six and -- what would be your cut-off point, 17?

"Answer: Yes."

The chairman then wonders:

"Is that just the way it is?"

And Professor Savage says:

"Yes, it is."

I wonder if we could get your view as to why there might be a comparatively small number of under-fives being transplanted. Was that common throughout the UK in 1995?

A. The numbers of small children requiring transplantation --

Q. Under-fives.

A. -- was small then and remains small, although the numbers have increased over the years. I think the reasons for them increasing are to do with the introduction of relatively aggressive treatment of kidney failure in small babies. In the mid and early 80s, children under a year of age were not treated in many centres if they developed renal failure and children under a month of age were not treated in most centres if they developed renal failure. That's on the

basis of published evidence.

One of the activities that I was particularly involved in when I first started in Newcastle in about 1986 -- 1985/86 was to start dialysing babies born with kidney failure and to introduce that as a technique. That initially was greeted with a degree of scepticism as to whether that was sensible or wise because of the potential suffering that you put children through and the anticipation then that this would not be successful.

I'm glad to say that that has proved not to be the case and I've actually published a paper that I've referred to somewhere in my submissions to you in which I reviewed all the children treated in the UK and Northern Ireland and Southern Ireland over, I think it was a two-year -- no, it was a longer period than that -- over a 10-year period, I think. I would have to check the details.

In any case, it was a period that actually encompassed 1995, and at that point --

Q. Sorry, I wonder if I could help. Is it Coulthard and Crosier, "Outcome of children who reach end-stage renal failure under two years of age"?

A. Yes.

Q. That's the Archives of Disease in Childhood 2002 and then there's a reference. I think the actual paper is

an appendix to your report 200-007-137.

A. Right. So what that study -- yes, that's right. What we did in that study was to do an audit of every paediatric renal centre in the UK and Ireland, of what they were actually doing in terms of management of children who reached the point that they required transplantation or dialysis before the age of two. And when we did that, we discovered that, in fact, universally throughout that population, all centres at that stage were taking on the management of small children.

Q. How does that help with why, out of a number of 31, say, there would be four under six? Sorry, Dr Coulthard, you weren't sure of it, your period over which you were considering for that research was 1988 to 1997, which obviously spanned 1995.

A. Yes. What was absolutely clear was that by 1997, all centres were actively treating children born under the age of -- sorry, who reached renal failure by the age of two and most of them were taking on and treating children before the age of one or even before the age of a month and we were looking at those specifically. My point is: in Newcastle, we started doing that the minute that I arrived really, so we had a population of children rising to the age of -- so we did more small

children transplants than were done here because in the preceding few years we had started treating children from birth.

Q. What would have happened to those children otherwise?

A. They would have died.

Q. So you were enabling children who might otherwise have died to come to be assisted towards transplant?

A. Yes.

Q. Thank you.

A. And it was clear from that publication that that was being done throughout the UK by the end of that study.

Q. I wonder if we might now look at the planning for the transplant in terms of getting together the necessary information, medical notes and records and so forth.

Professor Forsythe and Mr Rigg, and also Dr Haynes, have all said that one of the things that one does when a child goes on to the transplant register -- and you start to have these meetings geared towards the day, hopefully, when they receive an offer -- is that you start to put together the documents in a way that will be of most use for whomsoever would happen to be part of the transplant team and the time when the offer is received, and I think you've said a similar thing yourself because you simply don't know, if it's a cadaveric transplant, who will be there to be part of

the team.

Professor Savage, I think, referred to the fact that there were investigation summary sheets, which would compile some of that information in summary form, although I think he conceded that they weren't putting the information in the way that you were discussing it, but nonetheless there was assistance. We can look at one. 058-011-034.

Maybe if we blow that up just a little bit to make it clear. Right. Now, there are a series of these and this is the one for 1995, starting with 2 March and going up until 9 November, which I think is the clinic that Dr O'Connor thought that she might attend, but in any event was preparing for. If you look down the left-hand side one can see the kind of detail or the information, I should say, that's being recorded there. What I want to ask you is whether this would be an adequate substitute for the kind of gathering together of information that you had in mind when you talked about that process during the course of your multidisciplinary meetings.

A. This form of --

Q. Yes.

A. -- of sheet which puts, for example, the haematology and biochemistry results together in series is extremely

useful and it is exactly -- that element of it is exactly the same as we do. We also graph it, but --

Q. You also graph it, did you say?

A. As a routine, yes.

Q. Is there anything else that would be involved, any other information that you would be gathering together?

A. Yes. I mean, what you've got here at the top is the haematology results, some of them anyway, and --

Q. Sorry, some of them? Which are the ones which you don't have which you might wish to have?

A. You might wish to have the platelet count.

Q. The platelet count?

A. Mm. Sorry, let me just scan the ... I mean, essentially, I don't want to divert to trivial things. At the top you've got the main haematology result, which is the haemoglobin.

Q. Yes.

A. In the next block you have the important biochemistry results -- including sodium, potassium, the electrolytes, calcium and phosphate -- all of which are biochemical elements which, (a), the kidney normally regulates, so you have to regulate for the child and, (b), will affect the child's health such as the calcium and the phosphate, which impact on growth. The next section which is obviously a list of drugs on the

left-hand side. Beneath there, you have "Keflex" -- I can't read the next one -- but "1-alpha --

Q. Before that you have "dialysis".

A. Yes, but that doesn't seem to refer to anything. There's no dialysis information there.

Q. That's the point I was going to ask you. What I'm seeking to find out from you is what you would have --

A. What would we want?

Q. Other than what is reflected on this form.

A. The biochemistry information is obviously vital. You need to have a growth chart, which would mean height and weight, and they've got a space for height and weight, but it's not been used for height and weight so far as I can see.

Q. Sorry, just so that we can see, if you look right down at the bottom you see under 16 October 1995, his height is 102 centimetres and his weight is 20.9 kilograms.

A. Yes, but that's once over a very long period. The height and weight would be recorded at every -- should be -- the weight should be recorded at every clinic visit. And in my view, the height should be recorded at least once a month.

Q. So you want to see it over a time series?

A. I want to see it over a time series. In our notes, we wouldn't put it on here and if we had height and weight

printed on here we wouldn't use it, we would put that, (a), in the notes at the time -- written by hand at the time that you saw the child and, (b), on a weight chart --

Q. Okay.

A. -- or a growth chart, a height and weight chart. So that would be plotted. Each time you saw the child, you would add another point on the graph. That would be routine and that's kind of routine for an awful lot of paediatrics, not just to do with kidney disease.

Q. But just to be sure we are talking about the same thing, what I am asking you is: the information that, in your view, is being collated once a child goes on the register so that whenever that offer comes, the appropriate information is in a convenient place, that's what I'm asking. I'm asking you, in addition to this, what else is in that category, and are you saying a growth chart is in that category?

A. It would be in the category in the sense that you'd want to know what the child's recent weight was and where they were progressing.

Q. And so is it part of these conveniently collated documents?

A. I would expect it to be in -- a growth chart to be in those documents. More pertinently, perhaps, you would

want a dialysis chart. That is to say, you would want to have a chart laid out in a similar manner in the sense that there would be columns to make adjustments with each clinic visit. You would want a dialysis chart -- if there was a child on peritoneal dialysis, you would want a dialysis chart in which you had the child's prescription, current prescription for dialysis, and it to be dated when that was changed. For example, you would want to know -- with peritoneal dialysis, you would want to know the strength of dialysis fluid in relation to the glucose concentration, you'd want to know the strength in relation to its calcium concentration, you'd want to know what the cycles were that the child was having, you'd want to know how many cycles they were being prescribed and over what period. So you'd want to have that and you wouldn't necessarily fill it in every clinic visit, but you'd fill it in every time it was changed. So if a child was on a particular prescription for six months, that would be fine you'd just leave it as it was. But if you changed the strength of the fluid or the number of cycles, that would be entered. So you'd then have it all on one sheet so that with one cast of your eye, you can look at the whole dialysis history: he started on this amount, he went up to that, he changed to this and now he's on

this prescription. That would be a component you'd definitely want.

Q. Can I pause you there before you go into any other information you might be collating because there has been some evidence about the dialysis records and I would like to have your view on it.

Professor Savage in his evidence on the 17th -- I think he started it at page 102. If one goes down to line 19 he's being asked about -- in fact if one ... You have to start a little bit earlier for you to get the drift of it. Line 13. Well, actually line 9 where the question is:

"What exactly do you mean by the dialysis records? What are the records that you would expect to be there, if I can put it that way?"

Professor Savage starts to answer:

"There's a lot of dialysis records have been made available --

THE CHAIRMAN: The witness doesn't have this. It is page 97 you want him to go to?

MS ANYADIKE-DANES: Sorry, here it comes.

A. Line?

Q. The question starts at line 9 with:

"What exactly do you mean?"

And then you see the answer starting at line 13:

"There are a lot of dialysis records that have been made available and they're the parent-held records. The parent-held record for the last month, which I had hoped included the last evening, had not been found, as I understand it."

Then if one goes over the page -- this covers a number of pages, so forgive me if I don't read every bit of it, but I'm just trying to give you the sense of it to get your comment. Over the page at line 4:

"There appears to be no other record of Adam's regular dialysis regime filled in in his charts. This would suggest to me that the only dialysis records are those held in the family-held daily dialysis record, although the cycle-by-cycle record stored in the dialysis machine could be consulted by medical staff if required."

And the answer to that question is:

"Yes, I think that's correct."

And then if we go down to line 19, he's answering that:

"The dialysis records that Adam's mother kept are extremely well kept, but apparently the book for the last month hasn't been found."

Then the query is:

"So when you say 'for the last month', you mean

Adam's mother's book for the last month and not any of the records that may have been retained at the hospital over the period because the hospital did not, in fact, retain any. All that the hospital had was what was in the machine."

And then there's a question asked about how long the records would be consulted from the machine and there's an answer that you could look through the computer. And the question is then:

"Question: Was Adam's mother asked to bring his dialysis books with her?

"Answer: I don't know."

Then if one goes further down to line 20:

"There's no record in his medical notes and records of having received them [that's the books] and having consulted them or assessed them or anything of that sort."

And the answer to that is "no".

And then, over the page at 100, there is reference to the fact that the books have been looked at by you and the answer to the question at line 18 is:

"We would have looked at the machine or looked at -- and it would have been recorded in a diary."

And the question is:

"Question: You say you would have looked at the

machine. Was that available for Dr Taylor it see?"

"Answer: Well, if you remember, what I said to Dr Taylor was looking at his normal daily regime and [over the page] looking at what happened on the day prior to his transplant, I estimated that he might have been 500 ml behind and that was based on those sort of calculations."

Then he goes on to explain how he reached that. Then the question is:

"Question: I'm thinking of Dr Taylor himself coming in in the early hours of the morning to look at Adam's medical notes and records as part of his preparation for establishing Adam's fluid regime and what I'm trying to find out is what would be available for him to consult in relation to Adam's dialysis records?

"Answer: I don't know because we don't have the dialysis book.

"Question: What you're saying, so far as I understand you to be saying, is: what would have been available is the records that his mother kept in the book, if she had brought her books with her to the hospital to have the details in the machine recorded in the book."

"Answer: Yes."

And then over the page to 102, which is sort of

where I had started, but I think it was helpful for you to hear the question and answer before happened. At line 19:

"Question: In terms of what was actually happening that evening of his dialysis, is there any reason why any of that wasn't recorded in his medical notes and records so that anybody looking at his medical notes and records would have that information?

"Answer: I presume because it was available in the diary."

Then there is some evidence from Staff Nurse Murphy and she commented on the system in her evidence. Her evidence is on 27 April and I believe it starts at page 34. The question, if we go down to line 13:

"Question: Would you agree it would be a good idea for the dialysis details to be recorded somewhere?

"Answer: Oh absolutely, yes."

The question then is:

"Question: Is that the problem with having and relying upon a parent-held diary, that if it is not there for some reason, then there may not be a record made at all?

"Answer: That may vary.

"Question: Would you accept that it might be important in this situation where Adam is going in for

major transplant surgery for the dialysis details to be known because that's part of the piece of the jigsaw of fluid management?

"Answer: Yes."

Over the page, it's put to her a witness statement from Staff Nurse Sharratt and that starts really at line 3 and the quote is actually at line 4:

"I would have expected the accurate record keeping in regard to fluid removal during dialysis and Adam's weight that would be taken pre and post dialysis to have continued on the ward when Adam was admitted."

A. Okay.

Q. And then if one goes to page 37, this is still in Staff Nurse Murphy's evidence, at line 9:

"Question: This would suggest to me that the only dialysis records are those held in the family-held daily dialysis record, although the cycle-by-cycle record stored in the dialysis machine could be consulted by medical staff if required?

"Answer: Yes.

"Question: Do you recall any medical staff coming to look at the dialysis machine on 26 or 27 November?

"Answer: I don't recall, no."

Then if one goes over the page to page 38, going down to line 16:

"Question: And would it be a matter of practice that clinicians would come and look at the dialysis machines at the end of the dialysis?

"Answer: No. I really can't remember that ever being ..."

And then:

"Question: You don't recall that ever happening before?

"Answer: No, I don't really, no."

And then just finally on this point because Staff Nurse Sharratt, who I think is the renal nurse, and her evidence is on 27 April at page 160. Then line 19:

"Question: Were you aware of any records being kept in the hospital in relation to the dialysis details in 1995 for Adam?

"Answer: On that day?

"Question: No, as a matter of routine. Or was the practice that it was the parent-held booklet that was the only record?

"Answer: Generally speaking, you know, especially when I had a parent who was so competent and they liked to continue the care and they liked to keep the record and I would have thought -- I accept we have been told that Debbie might not have had that booklet. So she was very good at keeping it, I suppose in hindsight.

Although, to be fair it's a very tricky situation because Staff Nurse Murphy was also a very excellent nurse and she would have recorded that and the only thing I can come up with is that something has been mislaid or lost."

And the question is:

"What happens if the parent doesn't bring the booklet when the child is coming in for dialysis in hospital?"

Then at line 17 she says:

"I can't remember. We had another sheet, dialysis sheet, but I don't know if that was after this event or before the event, if I'm being honest."

Then she refers at line 22 to having brought over some precedents or specimens from the Belfast City Hospital.

So that is how the dialysis appeared to have been recorded. It seems, although something may emerge, but it seems that it was recorded in the parents' booklet and my question to you is: having said what you have said about the significance and what you want to record, what is your comment on that as a system of recording dialysis records?

A. Okay. The first thing to say is that dialysis -- a dialysis programme and fluid choice -- volumes and so

on -- is a prescription in the same way -- and it should be regarded in the same way that any other intravenous fluid or drug is prescribed. Therefore, just to put it -- I think it's helpful to put in context how you manage children on peritoneal dialysis. The parents are trained to a very high level to manage the process and they do it at home. When they're discharged home, they would have a prescription written for them or they would have a clear prescription of how many cycles over what period of time, using which fluid.

A child on -- and that would be in the medical records. In my view, best on a separate sheet for the reasons I've said because then you can look back at a whole period of time with one glance, but if it was just written in the records, it could still be worked out. That should be there in the same way that prescription of an antibiotic, say, would be there.

Children on peritoneal dialysis are -- I don't know whether this is absolutely universal, but we review them, as a minimum, once a month. And I suspect that they had -- looking at the times when the bloods were done, that's probably what was being done here as well.

At every clinic visit of a child on peritoneal dialysis, you would hope that the parent would bring the record. Obviously Debra Slavin did so -- some parents

don't, but most do, and -- I've seen her records, she kept them meticulously and she obviously brought them to clinics. What you would expect either the doctor or the renal nurse running that clinic to do would be to record a summary of what was going on. You'd say: saw a child today, over the last month, the ultrafiltrations have been between this and that. There have been no alarms or there have been some alarms because the machine is designed to alarm at night if there are difficulties -- the dialysis is run overnight. Those sorts of details would all appear every month in the written clinical record.

In addition to that, the mother -- it's usually the mother -- but the parent would keep a diary. We actually provided -- for convenience, we would actually provide a sheet with tick boxes and volumes so that rather than a page per day. That is the property of the family. But it's recorded and prescribed in the notes and the family are just demonstrating what they're doing and sharing that information with you by use of the diary.

The use of the chip in the machine, the child's own machine is at home. In those days, we were using PAC-X machines, and I know that he was on -- which was a great big machine and it's not something that ... They're now

portable machines, but then they used PAC-X machines. That wouldn't ever come to the clinic, although it is theoretically possible that you might be able to download information from it. That, in practice, wouldn't be done. What you would be doing, in practice, would be sharing the information in their diary, making a summary of it.

When a child came in to be admitted who was on peritoneal dialysis, you would expect the doctor to write a prescription for the hospital. If you take the parallel with drugs, a child might be on 1-alpha -- which is a drug used in kidney failure -- at home and the mother gives it to them. When they come into hospital, the doctor writes it on a drug chart and the nurse gives it from there. It may be in practice that the nurse will give it to the mother to give, but the nurse records the fact it is given and supervises it. Okay?

In terms of peritoneal dialysis, there's a very clear parallel. When a child comes in, you would want the drug chart written and their dialysis prescription written and signed by the doctor, and then for it to be carried out. In practice, probably the best person, the most skilled and quick person to carry it out on that particular child is very often the parent. And very

commonly -- I've never met Debra Slavin, but you'd say to a mum like that: there you go, set up your usual thing, you say you're on this, let's check what it is in the notes. It is written as a prescription and it's signed and then the processes of checking it are done, the bag numbers are written down and so on, exactly like an intravenous fluid. It's checked by nurses, although it's done by the parent.

Q. Yes. Let me just interrupt you a little bit there. It's not that there wasn't dialysis information, if I can put it that way, in Adam's medical notes and records. If I just take one example, 058-035-143, as an example. There we are. You see, that's 9 November. That's the last of the series that I just showed you in the previous document.

A. Okay.

Q. And then just a bit after halfway down you can see:

"Dialysis. Dry weight 20 kilograms. 15 cycles. Half hour intervals, 13 hours. Passed urine ++ query how much."

And so on. That's a note there. And there is a file, I believe it's 016, a file that has in it, apart from any other thing, a series of letters that Professor Savage would send to Dr Scott, who was Adam's GP. I have not seen whether they went every time, but

certainly there is some correlation between them and the dialysis clinics, and he would summarise in them what was happening. In those letters, if not anywhere else, if there was change -- I'll find one after the lunch break when I have looked one up to show you. But if there was a change to his prescription -- maybe they were going to change the cycles or even the dialysate -- that was in there.

A. That's right.

Q. So it's not that I'm suggesting to you that there were no records kept of Adam. The issue is -- you have talked about how one of the benefits of having these meetings is that you gather together the useful information that somebody who doesn't know this child can look at fairly quickly and appraise themselves of circumstances as they go in to the transplant surgery. So what I was trying to ask you is, if one deals with dialysis now, what is that and, in the way that it's been described to you, how the dialysis records were being kept, does that satisfy you as to what you were doing and what you thought was appropriate?

A. Yes. I mean, that -- the example you've highlighted there, apart from the fact it doesn't say what strength the bags are, but I'm sure that that would be available somewhere else in the notes. That's absolutely fine.

What is needed in addition, however, when the child's admitted is for that to be written as a prescription, even though it's what you normally do and what mum does at home and so on, it should be written as a prescription in order for it to be carried out in hospitals so people know what's actually happened in hospital when Debra is not there, for example.

Q. Would you expect all those references to be extracted and kept on some sort of sheet so that whoever was looking at it didn't have to leaf their way through however many volumes it is for that particular child, but could see these records that you are identifying as important records relatively quickly?

A. Yes. It's a matter of organising the notes. You'd have a current set of notes in which all of those records were easily available.

THE CHAIRMAN: Are you saying, doctor, that that was typically done in 1995 or, in 1995, it was maybe best practice, but it wasn't necessarily done across the board?

A. I don't know what precisely was done in other hospitals. Since I became a consultant in 1984 -- 85, we have always organised our records so that the pertinent information is available with a series of front sheets. There's a front sheet which summarises the surgery the

child's had, there's a front sheet which summarises the dialysis and a front sheet that summarises the biochemistry and a graph.

THE CHAIRMAN: So that when you get the short notice that a kidney is available for transplant, you don't have to go through the notes page by page?

A. That's right.

THE CHAIRMAN: There's a summary there and that may lead you to go through some of the notes in more detail, but not necessarily.

A. That's right. There's also a summary -- just to not ... Not necessarily posted in the notes, but available to the key people in the team -- the meetings where we would decide to update a child's status in terms of their urgency, those were minuted and kept by the transplant coordinator and were available so that actually when a kidney was offered, that information was always available to transplant coordinators and whichever surgeon was on. For example, if there was a specific note that you had to avoid this side of the abdomen or something like that, some surgical note or medical note about central lines or something, that would always be available to the transplant coordinator and the surgeon and the paediatric nephrologist.

THE CHAIRMAN: Thank you.

MR FORTUNE: Sir, before we leave the page that is presently on the screen, two matters arise. Firstly, the letter that follows that attendance in clinic on 9 November is 016-015-024. I will stand corrected, but we have not seen any prescription sheet for dialysis.

MS ANYADIKE-DANES: You mean dialysis on 26th and 27th or dialysis at all?

MR FORTUNE: Dr Coulthard is talking about how there should be a prescription sheet in much the same way as there is a prescription sheet for any other medication. I'm not aware of having been either served or had made available any such prescription sheet.

MS ANYADIKE-DANES: We'll have a look. I have something in my mind, but I don't want to say that in case I'm incorrect about it.

MR FORTUNE: We've both seen a lot of documents.

MS ANYADIKE-DANES: We have. I will have a look over lunchtime for you. That letter, I don't think, came up.

MR FORTUNE: 016-015-034.

MS ANYADIKE-DANES: Thank you very much indeed, Mr Fortune. This is the sort of letter I was going to try and find for you over the lunch break to show you the sort of thing that's written. I haven't correlated them all, but they pretty much follow his dialysis clinics.

A. That's absolutely appropriate. I'm sure that the first

letter referring to this would have given the concentration of the fluids. So what he's doing here is just updating the current situation.

Q. It is a very helpful summary. If you wanted to find that, you're looking at a different file for the correspondence between the nephrologist and the GP.

A. Well, you say "a different file", I mean we ... Our way of organising it is that all the historic information is kept in a series of files that are kind of there for reference. And the current set of notes for a child having a transplant is not a great pile of things but is one fairly slim volume with those front sheets and recent letters. It would have front sheets and the last year's worth of clinics and all the recent blood results and all the recent letters because the letters are a huge source of information. So if you then have a huge set of notes that were unmanageable, you would have to reconstitute a new set which would contain those core documents.

Q. Exactly. I think that's what you had been saying before. Now that the issue of prescription has been raised, irrespective of whether one calls it a formal prescription or not, as a matter of fact Adam had a shorter period of dialysis over the evening of the 26th and into the early morning up until 6 am of the

27th. I think he had eight cycles instead of his usual 15 cycles.

A. Yes.

Q. Is that something that you would have expected to have been recorded anywhere?

A. Yes.

Q. Thank you. If we now go back to 058-011-034. What I was asking you to do was to assist us with the other information that you thought should have been being collated. You had just addressed dialysis and I took you down to what actually was done in terms of dialysis. Can you help us with anything else other than that which is on --

A. Two other things that I would expect to be in the notes in a flow sheet form or whatever available. One would be a drug or medicines flow sheet.

Q. What does that mean?

A. So that means to say -- and it's probable that the block below the word "dialysis" is their equivalent of that, that block. You would expect to have a sheet in which -- so if you read across, for example, there's 1-alpha is the name -- a shorthand for a drug. The dose there, 0.6 micrograms daily, and the fact that there's an arrow presumably means that that's continued. Halfway across, there is an upward arrow and a star.

That would suggest to me that what they're using that for is an indication that at that point in time, they increase the dose and I guess that it would be a simple matter to go to the date that that was written, which would be something like July, or August or something, 1995, and you could find that in the notes.

So this is a method of recording the drugs and the changes to the drugs over a sequence, and that's important and that's obviously appropriate. So for the -- further down, for example, two from the bottom. Cisapride is a medication used for problems with digestion and so forth. Further along, it's got the dose, then there's an arrow indicating that it was being used and then there's a slash across, which suggests to me at that date, at that clinic, they decided to stop it.

THE CHAIRMAN: That's what you would be looking for and that's what there?

A. Yes.

THE CHAIRMAN: You were looking for dialysis details to be collated. You were looking for the drug flow, which is there --

A. Which is there.

THE CHAIRMAN: And you were going to say there was one more thing.

A. The final thing is that you'd want to have a -- some sort of surgical summary. That may well be best recorded in a letter, and I think that if there was a -- there was a letter in the correspondence which summarised it. I think that would be appropriate. Adam, in particular, had a number of operations on his -- the tubes draining his kidneys and that one was joined to the other and so on. These are procedures that quite commonly happen, but they're very individual and they're quite relevant to the surgeon and you would want there to be a place where that's easily accessible. I'm not prescribing how it has to be done. We happen to have a flow sheet for major procedures like that so you would actually list them one after the other. But equally, you could have an occasional letter that would summarise the whole of the urology.

For example, when we put a child on call and he goes through the process with a transplant surgeons, which I've described a number of times today, the end result of that would almost certainly -- well, it would be that the transplant surgeon would write back to me or to the nephrologist saying, "Thank you very much for arranging this clinic where we jointly met", and they would summarise their discussions, summarise the urology and its implications, so they would say, "I note this child

has had several procedures resulting in his ureters draining in this fashion and that means we will have approach the bladder from the left", or whatever, some conclusion. So that would be a good source.

MS ANYADIKE-DANES: Okay.

MR FORTUNE: Before we leave the document that's presently on screen, we've highlighted one line. Could the highlighter go down two lines to the change of the dialysis prescription, please?

MS ANYADIKE-DANES: It's just above "volume".

MR FORTUNE: Could we ask Dr Coulthard what he makes of that change, please? Because clearly there is a change, sir, from 600 to 750 ml. 15 cycles.

A. Thank you for pointing that out. My guess is that what's actually going on here is that this is a shorthand to point people to a date -- I mean, the information contained in that particular line is inadequate. But I suspect that this is being used as a pointer to direct somebody quickly and easily to the notes so that you would go to the date where that "750" was written. I would imagine in the notes there, you would find a full prescription. So that would be an entirely adequate way of managing this. If going to the records indicated by that column date told what you change had been made to the cycles, that would be fine.

MR FORTUNE: Sir, this seems to be some time in July 1995.
A. Yes.
MS ANYADIKE-DANES: There is nothing under "urea" or "creatinine clearance"; is that significant?
A. No.
Q. Can we have the thing back again? So apart from what you have already said about the growth chart and dialysis, better dialysis records and so on, is there anything else that is not on this sheet that you, in your system in Newcastle, would have been putting together on the summary sheet apart from the surgical information? I think that was another thing that you said.
A. The only other information which -- I'm not saying it's there or not there, but what you would hope to ... What you would need to have in there -- in a letter or somewhere -- would be your decision about matching criteria. In other words, probably in that surgeon's letter or an update after a review, you would say that, "We have decided to go for a live donor", or, "We have decided to go for a cadaveric transplant", and, "We are seeking a 1-1-0 mismatch", or some coded form for the precision of the match that we've chosen to opt for.
Q. Yes. And as to the actual plan, you at some stage said that an outcome of these meetings is a formulated plan

for the child's surgery, even if that was updated following a review for changes, but nonetheless a definite plan. Where does the plan fit in these documents that you're talking about?

A. The plan somehow is a combination of those. You would have the letter from the transplant surgeon, which would outline the surgical plans. That would be followed, if it changed, by letters either from the nephrologist or the surgeon to the GP, but as a way of informing the whole team that a change had been made, for example, that we had increased the urgency or something of that nature. Those would be documented by hand, but those would appear in letters. It would also be changed in the document held by the transplant coordinator, which was available for the team.

Q. I understand. In fairness, Dr O'Connor, who had come on 1 November from Bristol, said in her evidence on 25 April what her practice was. So that we can see if she was starting to or actually instituting the sort of process that you talked about. If one goes to page 32 and starts with line 4 she says:

"So what I did was to write a summary from day 1 -- you know, when the child was admitted -- what was wrong, what surgical procedures they'd had, what their drugs were, what their usual daily urine output was."

And she describes that as information useful to herself, to remind her of things. And then she goes on at line 10:

"Information such as bladder studies, urodynamics, any particular unusual thing about their tissue type, the viral infections they might have had or been tested for and all the vaccines they had had because it is important to know all this information before you immunosuppress a child."

Then over the page at page 33, continuing on, if I pick it up at line 9:

"But the practice now and since I've come is always that, at the time the child goes on call for a transplant, I make a typed summary of everything. That goes to the transplant surgeon, the transplant coordinators and, currently, to consultant who is responsible for live donor assessment."

I don't think they were doing live donation at that time, but she's I think indicating the sort of thing she was doing. Then at line 21 she says:

"That has always been my practice from 1995 when I was appointed."

And then if one just goes over the page to page 34, picking it up at line 4:

"I would have recorded in that note my plan for all

the drugs and I would made a plan for the post-operative parameters that I was prepared to accept in terms of blood pressure, CVP, urine output. I usually record what investigations I want done post transplant. I write maybe six, seven pages minimum."

And she's, I believe, talking about two different things. One is the documents that she would be recording and maintaining in this summary form for assistance and also what she would have done just going into the surgery itself, so pulling together exactly what she wants to have done and prepared.

Is that something that you recognise in terms of your practice?

A. We actually have a -- we, in fact, have a printed sheet which is filled in by the paediatric renal nurse specialist, ie the nursing kind of member of the paediatric nephrology team, which summarises all of that, and there's one of those in the front page of every child's notes that's on call. So every child, it will be when they went on call, what the matching criteria were and all those things. What we wouldn't do is put in, for example, the blood pressures we'd accept and the CVP and the urine output because those would come within a formula for our protocol. So we wouldn't, for example, have a different CVP from one child to

1 another or ... Those things would be part of the
2 protocol. But every child that is put on call has all
3 that information put on a front sheet as a routine.
4 Q. Then just finally on this information gathering phase
5 and how you compile it, there has been quite a bit of
6 evidence given as to whether Adam presented as
7 a complex, or not, surgical case, if I can put it that
8 way. Assuming that you're involved in these meetings,
9 is that one of the issues that would be discussed, how
10 complex a surgical case is likely to prove?
11 A. Yes.
12 Q. If it's out of your territory do say, but are you able
13 to express a view as to whether, if you were Adam's
14 nephrologist, you would have regarded him as complex
15 surgically --
16 A. I understand what you're asking and --
17 Q. -- in 1995?
18 A. I understand when it's for. The answer is that there is
19 always a spectrum. There's no child who's going to have
20 a transplant that isn't in some way going to have some
21 complexity or component. And there are some children
22 where the complexities are vast. I would consider Adam
23 to be kind of average. He is complex, he's had previous
24 surgery. Most of the children with polyuria have had
25 previous surgery to their ureters, certainly then.

That's done less now. They've mostly had central vein access. Someone who had had no urological surgery and no central vein access would be unusual and they would obviously be straightforward. There would be children that would be much more complex than him because their blood vessels were congenitally abnormal or something like that.

So within that, there's always a degree of complexity. Someone can always find a child who is more or less complex; he is kind of run-of-the-mill -- that is an awful term, it suggests like a factory process -- but he's kind of a degree of average complexity for a child of that age coming for a transplant.

Q. Thank you. I want to move on now to talk about live donation. I presume from what you have said in your reports that that is another issue that would be being discussed at these meetings.

A. Yes.

Q. Professor Savage in his evidence of 17 April has addressed the question of live donation. I think it starts at 69, line 4 I have it as.

MR FORTUNE: Would you go back to the bottom of page 68, line 25?

MS ANYADIKE-DANES: Yes. Quite right:

"So I am aware that Debra Strain offered to become a live donor for Adam and, of course, Adam was her entire life and I accept that. As his nephrologist, I don't recollect exactly what I said to her."

And in this section from 14 down to 23 he's really expressing his view:

"My feeling would have been that Adam was totally dependent on Debbie Strain. He was very close to her. He was very dependent on her. She looked after all his dialysis, all his tube feeds, all his medicines. She lived and breathed for that little boy. He was a lovely little boy."

Then he goes on to his thought processes:

"My feeling probably was that to do one of our first live donor transplants in that situation where there's a risk to the mother and a risk of failure because he's so small -- putting an adult kidney into a small child -- and also the idea that she would be ill in a different hospital and not be there for him during the transplant and because she was single parent -- although I accept, of course, that his grandparents were enormously involved in his care as well -- I thought, on balance, that that was something we should not pursue, and I believe I advised her, 'Let's put him on call and see if we can get a cadaver transplant, then you will be

there to look after and to support Adam through that transplant'. I think that was probably the discussion that we had."

And then he goes over the page. I wasn't necessarily going to read absolutely everything, but he goes over the page to talk about the risks. He said she could be quite unwell for six months afterwards. Then at line 8:

"They probably would have been better, but you'd still be putting an adult kidney into a small child. If you remember, the kidney was selected from a 16 year-old, which is not quite an adult."

When asked about risks later on at line 23, we pick it up:

"However, the risks of this happening are so small [this is quoting from your report] -- that is the parent dying as a result of the surgery -- are so small as to make this an unreasonable blanket policy decision either in 1995 or now. The risk of a donor dying is extremely small. It was of the order of 3,000 to 1 against in 2001 and this has not changed in 15 years. In my experience, this risk is considered so low by relatives considering donation that it hardly enters into the decision makes compared to the other issues."

And Professor Savage accepts that and he responds to

the chairman:

"It wasn't that that was part of his reason."

No quotes.

Then he goes on:

"In 1995 [line 15], there was a marked difference between the chance of success of a live donor and one from a cadaver. Would you accept that?"

And he goes on to say -- talking about the cold ischaemic time and the difference of that. If we pick it up at line 23:

"As I say, I was trying to discuss with Debbie a balanced approach to the care of Adam and I thought there's no risk to Debbie with a cadaver kidney; she would be there to support him through the trauma of the surgery. And remember, he had had 20 operations; it was very traumatic for him to have an operation and those were the sort of things I put to her. We're better to go for a cadaveric kidney."

At line 9:

"It wasn't a blanket decision; it was looking at Adam and his mum and the family and trying to work out what was the best for them. Sadly, it didn't work out that day, of course."

So that is -- I hope I've captured in reading those Professor Savage's actual thought process. What

actually Adam's mother had to say about it is in her second witness statement, which is to be found at 001/2, page 5. It's the answers to question 25 right down at the bottom. The first is to do with carrying out the transplant in a hospital other than the Children's Hospital and then at (b) in particular:

"Did anyone discuss the possibility with you of using a live donor?"

And she says:

"I asked if I could donate, but as a single parent this was not allowed. Apart from that, there was no other discussion on a living donor."

Then Mr Keane, he gave evidence on 23 April and I think it starts at 137. But the upshot is that he wouldn't dream of a live donor procedure on Adam Strain. That's to be found at lines 17 to 19. And he said:

"His mother was a single mother and might die or suffer a complication [I think that's page 138, lines 1 to 4]. Also her kidney was larger than the adolescent one."

And I think he deals with that at 138 and 139:

"And he would need an aortic graft."

That's, I think, page 139, lines 7 to 12. And Mr Keane expressed the view that he would not do an aortic graft, so if that's what was required then Adam

would have to go to London.

Finally, Professor Forsythe and Mr Rigg deal with it. That's to be found -- I think it's 3 May -- in their evidence. It really starts at page 171, line 22. There are some other references about how much discussion there would be, but I'm trying not to read out extensive tracts of their evidence. This, I think, captures it:

"In 1995, I think the possibility of live donation would at least have been raised. If any family member showed an interest in live donation, we would then want to give more information."

And then he goes on, over the page at line 11, to talk about.

"... live donation being the best and probably most successful form of transplantation of kidney transplantation."

Then he goes on to talk about the fact that it happens in an almost elective way. He says that at lines 22 and 23. Then, at page 173, it is -- the very passage from Professor Savage's evidence that I read out to you at the start of this is read to him, starting at line 24 on page 173. That goes on and if we go to page 176, picking it up at line 11, Professor Forsythe says:

"So I'm not sure how much of that had been shared with Adam's mother. But that seems to be an entirely appropriate thought process."

Because that is what the chairman had put to him:

"Was there anything wrong with the way in which Professor Savage was viewing it, the considerations he was taking?"

And Professor Forsythe's view is there's nothing wrong with the thought process; it's a matter of how much of it had been shared with Adam's mother.

And the chairman goes on at line 17:

"That was his thought process, but it hadn't been shared with Adam's mother. And I get the feeling from you that you're point is that you are not necessarily critical of that thought process, but that is something which should be discussed with her."

And he answers at line 22:

"Spot on."

And over the page, Adam's mother's evidence that I just read out is put to him. And if we go over again to page 178, line 18:

"I agreed with what the chairman said, that I felt that Professor Savage has obviously thought that through very carefully and I would have thought that would have been discussed fully with Adam's mother."

So I hope that I have captured what people were saying about it. The upshot from Professor Forsythe and Mr Rigg is that however sensitive the area is, and that was nonetheless an issue, that they felt should have been discussed with Adam's mother. I wonder if you could offer your views as to what sort of discussion there should have been or, in your view, there should have been between -- well, it really doesn't matter between whom, with Adam's mother about live donation.

A. Thank you, I'll do that. Would it be helpful for me to -- there are a number of issues within all that that was said that I feel it might be useful to draw your attention to in relation to this. Just to put this in context, we're trying to look at what happened in 1995.

Q. Yes.

A. In 1984, when I -- or 1985 when I was consultant, it was done very differently from how it was done in 2005.

Q. Yes.

A. Okay? And there has been a gradual process through that time. The reasons for those changes are important, I think, in understanding where we were in 1995. Okay? If I can just take you through some of those things.

Q. Of course.

A. In 1985, everywhere there was quite a big problem with children, small children, receiving kidneys which then

clotted. Quite a lot of transplanted kidneys clotted within the first day or days of transplantation, and the failure rate -- we're not talking about death rates here, we're talking about failure rate of a kidney. The failure rate of a kidney was considerably higher in 1985 than it is now.

That change of improvement in survival of kidneys because of loss of -- because of them not clotting happened in about 1990 and, by 1995, it was very different. So that change occurred there. And this is a major factor in people's thinking about live donor transplantation.

The factors that -- some of the factors which were changed then are not particularly important for you to hear about, but one of the factors is that the even more aggressive use of fluid volume and running a high CVP to make sure there was plenty of blood in the system. The second one was that a -- and a major one was that children's transplantation, small children since then have had the anastomosis from the arterial -- from the kidney artery to their artery moved to a larger diameter of vessel. When I started looking after these people in the 1980s, most children had their kidneys attached to the external iliac -- sorry, the internal iliac artery, which is big enough in adults to supply a kidney

but is not big enough in children to supply a kidney. And there was a move to move up the blood vessels.

By 1995, all the children that we were transplanting all had their transplants put on to the aorta or the common iliac, which is the first branch -- the aorta is the major artery coming down and that divides into two very large arteries and that divides subsequently after that. And in adults -- before that, it was on sort of the third branch and subsequently it was put on to the aorta. So the observation about not being prepared to put a graft on the aorta comes kind of out of context there because I think that was how it was being done. These are all relevant to the issues about what's the chance of kidney survival and therefore would you risk a live donor kidney. Okay?

By 1995, the survival rate for kidneys for them not clotting was very, very much better than it was five years earlier, and it seems to me that's the major stumbling block with live donor transplantation. In 1985, we did not routinely suggest live donor transplantation to parents. If they suggested it, we would discuss it.

By 1990 and subsequently, once things were improved, we would routinely ask. Now, just taking this right through, it's kind of up there as an absolutely major

issue.

Q. Sorry, could I just be clear about it. What are you saying about the discussion that would happen by 1995 and who would initiate it?

A. Okay, yes, thank you. By 1995, I'm not sure that we would always initiate it, but we would always -- I think there would be personal variations about that. But I think that by 1995, anybody requesting information about it would have that discussed very deeply because by then it would be considered a very reasonable approach.

The things that would stop you, would make you reticent to consider live donor transplantation, are not really what may appear to be obvious issues like the risk of the survival of the mother because the risk of actual transplantation for the mother -- of giving a kidney -- is very, very small. The major problem is that you are going to put a kidney from a living person where it's useful and doing an important job into a child where, prior to that time in the 1980s, where there was still quite a high chance it would clot. And that would be a major problem that you would that feel you would put the child through that, put the mother through that, the child wouldn't be supported by the mother, and at the end of the day, there's not a high

chance the kidney is going to work --

Q. Yes, but could you please deal with 1995 because you said that quite a lot had changed.

A. Sorry. Following that, by 1995, because the survival of kidneys has changed, it is then in my view a very positive and useful thing to move towards live donor transplantation and, absolutely definitely, we would respond to a parent requesting it. I think the reason why people didn't actively go out and discuss it was because there was an anxiety that you would induce a feeling of guilt if you suggested it to a parent who then felt pressured morally if they didn't really want to.

THE CHAIRMAN: Which was part of Professor Savage's thinking.

A. I think that was a common view at the time and one still feels a little bit of anxiety about that, but actually now it's a routine that we would offer always it.

THE CHAIRMAN: I have your point, doctor, that I think what you're saying is that: by 1995, I'm not sure that we would always initiate a discussion about live donation, but if any parent did raise it, then that would lead to a very deep discussion with that parent.

A. Absolutely right. Absolutely right. Yes.

MS ANYADIKE-DANES: Thank you.

A. Could I also just in terms -- in case it is not raised later, but it has been mentioned several times and it grates with me. The size of a kidney from a 16-year-old female is adult. I mean, females, if you look at growth charts, girls reach adult weight and height by about 13 and their kidneys certainly will be adult size. So the different between a 16-year-old -- a kidney from a 16-year-old and an older woman, a mother, in size is not different. A 16-year-old kidney may be preferable because it's younger and potentially fitter and maybe has a longer lifetime, but in terms of size there's no difference.

Q. In fairness, Mr Keane gave evidence and he said it was a small kidney.

A. It may have been a small kidney, but the argument as to whether it is from a 16-year-old or a 30-year-old doesn't influence that. The fact is that by the time -- if you look at growth charts and kidney growth charts, they reach their adult size before 16 in females. Obviously, boys grow longer than that, but girls don't.

MS ANYADIKE-DANES: Mr Chairman, I was going to go on to something slightly different. I wonder --

THE CHAIRMAN: This is a good time. I don't want to rush Dr Coulthard's evidence or anyone else's evidence, but I'm a bit concerned about the rate at which we're making

process. It was highlighted to me when, in order to be as fair as you could to all the people who have given evidence, you went through all the extracts for about 10 minutes -- I think from 12.55 to 1.05 -- about what Professor Savage said about live donation and what everyone else had said and then Mr Fortune asked you to take a bit longer than that -- an extra few pages. The problem about that is that I'm not finding that terribly helpful to go back over all of this evidence as an introduction to a question to Dr Coulthard: what do you think about live donation? Particularly when it ends up with him saying in terms: I'm not sure I would have done much different in 1995 to Professor Savage.

A. Sorry, that is not what I was going to say, sorry.

MS ANYADIKE-DANES: Sorry, Mr Chairman. I thought that he had said that he would. I think he said he would have discussed it in detail with her.

THE CHAIRMAN: No --

MS ANYADIKE-DANES: -- if she had raised it.

THE CHAIRMAN: "I'm not sure we would always have initiated it if it was a live donor, but any person who asked about that would lead to a deep discussion."

My point is this: because we have more and more experts giving evidence, if we introduce every topic with an expert by going back over what everybody else

has said, the questioning of each witness will potentially become progressively longer and I don't find that a very helpful way through things. I think it needs to be shortened a little, otherwise these witnesses will get longer and longer.

MS ANYADIKE-DANES: I'm very grateful for that indication because quite often is the issue is others want certain witnesses' positions put in a slightly fuller way. If you, sir, are not finding that helpful, then I am very grateful to be able to short-circuit that. Everybody has the transcripts, the experts themselves have read the transcripts and I am more than happy to cut through some of that preambular work and get straight to the question.

So that we're clear, though, and maybe Dr Coulthard does need to revisit it, I thought the way that you had summarised what Dr Coulthard had last said about live donation is that if it had been raised, it would have been discussed in detail. And I thought your summing-up of the position was that that left Dr Coulthard in much the same situation as Professor Savage. I don't think that Dr Coulthard considers that he was in much the same position as Professor Savage because, apart from anything else, the mother's clear recollection is that it wasn't discussed. But I saw Dr Coulthard shaking his

head there, when you, sir, summarised it in that way. I don't know, if for clarity, whether we can have your view.

A. If a parent asked me in 1995 what the possibilities were about live donor transplantation, we would have dealt with it very differently from how it was dealt with. What we would have done would be to discuss the advantages and disadvantages with the parent of live donor versus cadaveric transplantation, number 1. Number 2, automatically, if they had raised it, we would take their blood and tissue type them. It's obvious that because they are the parent, they are at least -- because they are at least a 50 per cent match, but it's very often you will find that because of similarities between the parents, they may be much better than that. And that would massively influence your decision. So you certainly wouldn't -- you wouldn't go to a full deep discussion with the parent until you knew that because the discussion, if they were a full match, which we've seen a number of parents like that, would be very different from if they were a half match.

THE CHAIRMAN: Okay, thank you very much. 2.05.

(1.17 pm)

(The Short Adjournment)

(2.07 pm)

MS ANYADIKE-DANES: Just a small amount of housekeeping before we get started. There was an issue when Mr Brown was giving his evidence as to whether or not his statement was signed. I think the statement that was pulled up was 093-011A-034. We'll just see that now.

You can see Mr Chairman, there's a space for the signature. It wasn't there. And in fact, as one went to the end of the document, there was no signature at all. As a result of that evidence, the PSNI, in the form of Detective Chief Inspector Ian Harrison, wrote to the inquiry. One can see that letter at 093-040-001. I think this is the document that people may not have had an opportunity to look at and, certainly, we've only just received it ourselves. But in any event, the first and second paragraphs are summarising the --

THE CHAIRMAN: Just before you go any further, is Mr Brown's solicitor here? Good, that's fine.

MS ANYADIKE-DANES: Sorry, I should have said that. His counsel's not here, but his solicitor is. There's paragraph 1 and then there is another unnumbered paragraph under beneath that. That really is setting out the procedure whereby the statements were taken and involves the involvement of the solicitor.

Paragraph 2, at the bottom of the page, is where the detective chief inspector is setting out his response to

the statements made by Mr Brown in his evidence on 1 May. He says that Mr Brown was interviewed by DS Cross and DC Monaghan on 9 August. If one goes over the page to 002, one can see, at (b), he was saying it wasn't possible to prepare in advance by transcribing the statement, so the complete interview is recorded in handwriting, and Mr Chairman, you saw that.

Then Mr Brown declined to sign it at that time. He left with a photocopy of it. And then, by arrangement, on 4 September 2006, it was signed and there were no requests to make any amendments. So he had it for just about a month before signing it.

Then Mr Chairman, at 093-039-001, that is the signed copy of the statement of Mr Brown, which he provided to the police in September. In fact, it is dated 4 September. So although he was interviewed in August, he took the photocopy away, considered it, didn't make any request for changes and ultimately signed it on 4 September.

THE CHAIRMAN: Just by way of example, could we keep that page on screen and put back up 093-011A-034?

MS ANYADIKE-DANES: There, I think, you can see, Mr Chairman, that ...

THE CHAIRMAN: Well, I think Ms Wylie should see this. This signed copy has just been received, has it?

MS ANYADIKE-DANES: Yes, that's correct.
THE CHAIRMAN: And the letter from DCI Harrison has just been received?
MS ANYADIKE-DANES: That's correct.
THE CHAIRMAN: I presume you want a little time to look at that and speak to Mr Brown about it.
MS WYLIE: Yes, please.
THE CHAIRMAN: If Mr Brown doesn't accept what is in the police letter, then I will invite him to return to give evidence.
MS ANYADIKE-DANES: Thank you very much indeed, Mr Chairman.

Mr Chairman, I want to move on to an issue which has been touched on in part, but it's of assistance, I think, to have Dr Coulthard just say his position. That is the urgency of Adam's case.

Professor Savage gave evidence on, I think it was 17 April, and one sees it at 105. Dealing with that issue. He goes on over the page to 106 -- I think, at 105, it starts at line 2 -- and on 106 it goes on to line 17. For obvious reasons, I'm not going to go through all of that. But in any event, that is what he said about it.

Then in your report, Dr Coulthard, the reference is 200-007-114, you said in relation to urgency, effectively, that a child who was thriving happily on

dialysis would be listed to have an especially well-matched, in other ways, extremely suitable kidney.

At the stage when Adam had the offer of a kidney, would you describe Adam as "thriving happily on dialysis"?

A. From what I've read, yes.

Q. So in terms of the options that his mother had at that time as to whether or not to accept that particular kidney at that particular time, Professor Forsythe and Mr Rigg have expressed their view about it and also expressed their view as to the quality of the match, if I can put it that way, leaving aside issues to do with the anatomical features of the kidney and its cold ischaemic time and so forth. But from your point of view, as a consultant paediatric nephrologist, how urgent was it that Adam had accepted that kidney for a transplant then?

A. Do we have the information -- the mismatch data easily available?

Q. Yes, we do. It is in his medical notes and records and it is a note that Dr O'Connor made.

MR FORTUNE: It's 059-006-012.

MS ANYADIKE-DANES: Thank you. There.

A. Right, so it's 1-1-1. Okay.

Q. Well, in fact it's not so much that -- the mismatch has

been highlighted, but so far as Professor Forsythe and Mr Rigg were concerned, it's not so much that, it's, they said, within those categories of A, B and DR, some of those are more important to have matched than others, from their perspective.

But in any event, what I am asking you is how urgent was Adam's case that made it necessary or appropriate for him to accept or his mother on his behalf to accept that kidney at that time?

A. In 1995, I would have accepted that kidney for him. I would have considered that suitable. I mean, the problem is that every kidney has some advantages and some disadvantages. Taken as a whole, it's a 16-year-old kidney from a female -- so it's not huge -- young, um ... 1-1-1 mismatch is not ideal, but it's not bad and it's what we were accepting in those days --

Q. It's a slightly different question that I've put to you, although it's helpful --

MR FORTUNE: I think I heard Dr Coulthard say -- and I've seen it on screen -- that the kidney was from a female. My understanding is that it was a 16-year-old male.

MS ANYADIKE-DANES: No.

A. It's referred to --

Q. No, it's a female. If you look at 058-009-025,your

options are: "1, male; 2, female". Do you see that, right down at the bottom left-hand side? "1, male; 2, female." And "2" is in the box. It's a female.

I think I understand where the confusion might have arisen. The other kidney was transplanted into a male, you're right, but this kidney, the donor was female.

Sorry, it wasn't so much whether you would accept it, although that's a helpful piece of information to know; it's how urgent it was that it be accepted for Adam given his physical state at the time is the question.

A. With respect, these things are very closely interrelated.

THE CHAIRMAN: They must go together to some degree at least.

A. They are obviously interrelated. In 1995, I would have accepted a 16-year-old female 1-1-1 mismatch kidney for a child who was stable and doing all right. Now, we would demand a slightly closer matching than that, but in those days with the arguments that were prevalent at the time, that would have been considered acceptable for a child who was stable.

MS ANYADIKE-DANES: We're going to go on to it, but now we're at this stage, Professor Savage's view was, although, ultimately, I think he deferred to the views

of the transplant team to have a rest, but if it had been down to him, if I can put it that way, he had his concerns about the cold ischaemic time by the time the operation would happen, going over 24 hours. And Professor Forsythe and Mr Rigg had said that they wouldn't have accepted it, for a number of reasons, and that's one of them. Sorry, that's part of the reasons that they wouldn't have. Would you have had any concerns about the cold ischaemic time in 1995?

A. Obviously, one would always have a concern about a relatively prolonged cold ischaemic time. It's one of a number of factors that you would throw into the mix. I think that a cold ischaemic time of 24 or 36 hours is definitely not ideal. But being a young female kidney with a mismatch of that level, I would have accepted that.

Q. Thank you.

A. If I can just -- there are some features of a satisfactory or unsatisfactory nature of kidneys which have a permanent and long-term impact. Mismatching, for example. There are some features which have, in my view, a relatively short-term impact, and the risk of a prolonged ischaemic time is that the kidney may well not start -- it has a lower chance of starting, working straightaway, but in the long-term there's -- certainly

then, we believed there was little difference in long-term outcome. So with a long-term view, I would have been less influenced by that than perhaps they would have been.

Q. Just as you're at that point, it might be helpful to have your views on it in this way. In fact, if we call Professor Savage and Mr Keane part of the transplant team, if we call them that, they both had different views as to accepting the kidney, and ultimately, although it is a joint decision, when it came down to surgical elements, if I can put it that way, I think it's fair to say that Professor Savage said -- I'm not sure he quite used the word defer -- but he has expressed his view and if the surgeon is content to proceed, then he would agree.

In fact, we have -- if you were in the position of Professor Savage and Professor Forsythe and Mr Rigg were in the position of Mr Rigg [sic], there's also a difference, but round the other way in the sense that you have -- you're prepared to accept something that, if they held to their view, they would not be willing to accept. I wonder if you can express a view as to how that's resolved.

A. Certainly. I think the elements of choice in this kidney -- the age of the donor and the likely size of

the kidney and it's from a female and the mismatch -- would be ... All of these would be up for discussion, but those would be elements to which the --

Q. Sorry, just in there --

A. -- paediatric nephrologists would have the major ... Those would be the elements that the paediatric nephrologists would have the major say in, I think. Whereas the anatomical details of the kidney, I would defer entirely to the surgeons. This kidney was also -- had two arteries on a patch and, possibly, a third one tied off. Those anatomical elements I would hand entirely to the surgeon and, if the surgeon was happy to proceed anatomically with that kidney in that child, then the issues about the age and size and whether you were likely to get a short time of non-function because of longer ischaemic time would be issues that I would have a strong view on. We would debate it and, at the end of the day, it would not be in my interests or anybody's interests for me to push a surgeon into doing a transplant he didn't want to do. I think, ultimately, the surgeon's doing the transplant and it is his decision.

Q. One element that maybe didn't come out quite in how you were discussing it, one of the things that was of concern to them is -- I don't think any of them felt, in

particular -- any more than any other particular surgery is -- was some sort of life-threatening thing, if it failed, to the child. But what they were concerned about was a potential failure of the graft and they'd rather that didn't happen. Not only that, they would want to have the transplanted kidney there for as long as possible in the child given that Adam wasn't yet five and they're looking to have the longest possible use that he would have of any transplant kidney. And that, if I'm not misrepresenting them, was being factored into their considerations and their view was that, quite apart from the anatomical features, which might affect the level, quality, flow of blood into the kidney, their view was that that a long ischaemic time for them was just one of those things that they were concerned might lead to delayed graft failure and that was of concern to them.

So what I am trying to tease out with you is, if you have the surgeons having that concern as to the likely success of the transplant and, therefore -- or if not failing, literally then, but failing some time slightly later on, if that's their concern, how do you and the surgeons resolve that between the two of you?

A. Well, obviously you would do it by debate on each issue, but, in fact, I would take issue with the argument as

you're presenting to me if that's how it was being presented. I think the issue about the artery, the arteries and the anatomical thing is an entirely surgical decision. The issue with that is the biggest risk with that is that it will thrombose, ie clot, pretty well straightaway, in which case, you know, that's an issue: will it work or won't it work?

The issues about the age of the kidney and the size of the kidney are to do with how long you expect the kidney to last. The issue about the closeness of match is to do with how long you think it's likely to last because a slightly mismatched kidney is likely to be not lost immediately, but to be lost years earlier than otherwise.

The issue about cold ischaemic time, in my view -- and I realise there's an academic view about it -- but it's still my view and it was certainly my view in 1995 that the major disadvantage of having a kidney which has a longer ischaemic time is that the kidney, in the short-term -- short-term -- is reversibly damaged, not in the long-term. So in other words, if we were to accept a kidney with a long ischaemic time, but other factors that were quite good, the particular risk we would be taking would be that the child would wake up with a kidney that was perfused and that had the

potential to work but wasn't working for the first week or two or three weeks which would mean we would have to carry on dialysing him, but with the anticipation that it would then improve. Because my belief is that the evidence shows that the cold ischaemic time causes a short-term reversible problem, whereas the issues about putting in a very old kidney or a kidney that's very small, too small or whatever, or a kidney that's badly matched is that that's not likely to last years.

So that would be -- and as I'm talking to you about that, that would be how I would discuss it with the surgeons and we would come to a conclusion. But at the bottom line, I have to say that, for those issues, how we resolve it is I've always felt that the paediatric nephrologist has to defer to the surgeon because it's the surgeon who's actually going to do the procedure. So if --

Q. That's what Professor Savage said.

A. Well, I think that's right. He has the deciding vote.

Q. Thank you. I wonder now if I can ask you about the recording of urinary sodium results.

Professor Savage deals with that at page 120 of his evidence on 17 April. At line 19, he accepts that although it wasn't recorded after 1993, he accepts that it would have been beneficial to do, which I think was

your view, that it would have been. He says it would have been beneficial to have had it done six-monthly. What I wanted to ask you is how often do you think Adam's urinary sodium should have been measured?

A. I think it's critical that it is measured at the time of transplant.

Q. Yes.

A. Okay? And beyond that, its use before then is interesting and informative, but not essential. I would not have any problem with a transplant unit which didn't measure urinary sodiums except at the time of transplant. That would be -- that would satisfy most of the requirements because most of the management of a child's plasma sodium and their handling sodium prior to transplantation can be managed in other ways without using that measurement. I personally use it because I find it useful, but I can't argue strongly that other people should do that. I would argue very strongly that measuring it at the time of transplant is essential, in my view. Beyond that, it's helpful, but there are other ways of dealing with the issues.

Q. So if I just summarise it in this way: your concern was not that they had been measuring it periodically since 1993, your concern was having stopped measuring it in 1993, they were using 1993 figures --

A. Absolutely.
Q. -- and extrapolating from that what his urinary sodium might have been on 26 November?
A. Exactly.
Q. Thank you. Is it necessary or appropriate to measure his blood creatinine or urinary creatinine?
A. They're very different. The blood creatinine measures how well your blood is being cleaned of impurities. Before the time that a child has dialysis, it reflects their kidney function and, as their kidney function is declining, once they're on dialysis, it reflects a combination of the kidney function and the dialysis function. And it's a measure of how well you're achieving the clearing of his blood. So that is useful at that point. And obviously, once you've had the transplant, it's the main indicator of how well the transplant is working. So the plasma creatinine is something that is absolutely essential for different reasons at all times.
Q. Yes.
A. The urinary creatinine is a very different situation because it informs of different factors. I personally have argued strongly in academic circles and in papers that the urinary creatinine is an extremely useful clinical tool to understand the way that children's

kidneys are working under a variety of conditions, not just in transplantation. But I have to say that many paediatric nephrologists don't share my commitment to the importance of that. I think that in this situation what is vital is a urinary sodium -- urinary creatinine I find helpful and I could explain why, but it's not really relevant, I think.

THE CHAIRMAN: It is the urinary sodium which is critical for you?

A. The urinary sodium is critical because -- yeah, it tells you how much salt is being lost every time you pass urine, how much salt is being lost and how much water is being lost. The urinary creatinine informs you about details of how the kidney is, of itself, functioning and I find it useful for a variety of reasons. I don't think it's critical to management.

MS ANYADIKE-DANES: I understand that. Can I just put the point in this way? Professor Savage was asked about whether Adam's urinary creatinine should also be measured in his evidence on 17 April, page 122, line 2 to 6. Ultimately, his answer is he would have no reason to do that. Is there a reason to measure it?

A. Well, there is, but it's not critical. The reason to measure it is that it allows you to precisely calculate -- may I explain? Creatinine is a waste

product in your blood. When it's cleared from your blood, if you've got a kidney that's working as opposed to dialysis, when it's cleared from your blood, it appears in your urine. If you know the concentration of the creatinine in your urine, it can actually give you precise information about how hard the kidney is working.

I personally find that information informative in management. Many paediatric nephrologists merely choose to look at the plasma creatinine and make assumptions from that. I think you could be more precise if you use urinary and plasma creatinine. I would perhaps be described as being obsessive in saying that, but that is my view that it is a more precise way of managing it, but I wouldn't criticise somebody for not doing so.

Q. It's not an issue of criticising anyone, it's just understanding. In 1995, were you alone in that view or were there others who were measuring that, so far as you know?

A. Where I was trained, it was a routine measurement and it was --

Q. You mean Great Ormond Street and Guy's?

A. Yes, it was used there, yes.

Q. Thank you. Can I go now to the issue of fractional excretion? Professor Savage was asked about that as

well. He referred to a paper that you wrote in 2008, proposing that fractional excretion of sodium and water was a help in deciding which intravenous fluids to give. But he indicated that that was 2008 and it wasn't common practice to measure it in children in 1995. Would you accept that?

A. Um ... Could I say that that paper is taken a little bit out of context in this inquiry. The reason being that I have argued that the fractional excretion of sodium is very useful in understanding what is happening in a child who has an electrolyte disorder, whose kidneys are working, because the fractional excretion of sodium allows you to deduce how the kidneys are working: whether they're avidly retaining sodium, whether they're avidly retaining water and so on. In a child with end-stage kidney failure, we know that kidneys are not capable of that flexibility. This is a measure of kidney function flexibility. We know in a child with end-stage kidney failure that he hasn't got any, so my argument there was: this is what I think people should use in children who have normal kidneys. That paper was written for children with normal kidneys.

Q. Yes, but can I take you back? Are you accepting his position that, in 1995, that wasn't something that was common practice to measure?

A. I used it -- I've used it since I was trained in the 1980s.
Q. I appreciate you have.
A. I don't know the answer. I know that for -- in our service it's something that I teach my -- I've always taught my juniors to use and I have always found it useful. The fact that I wrote that paper was probably stimulated by the fact that it's not used terribly widely and I think it would be better if it were. I haven't done an audit then, but I suspect it isn't used as widely as --
Q. Can I --
A. -- it could be.
Q. When you were being trained at Guy's and Great Ormond Street, were they measuring fractional excretion rates then?
A. Yes.
THE CHAIRMAN: Your point, as I understand it -- and please correct me if I'm wrong -- you're not clear that it's relevant to this inquiry because it's about children who have normal kidneys, whereas clearly Adam did not have normal kidneys? That's why he was in end-stage renal failure.
A. That's correct.
MS ANYADIKE-DANES: So the measuring of Adam's fractional

excretion rights wouldn't have assisted?

A. Not in managing him, no.

MR FORTUNE: Could we establish from Dr Coulthard whether his particular interest in measuring the fractional rate stems from his degree in physiology?

A. It doesn't, no. It stems from my clinical practice and the fact that, in clinical practice with children with normal kidneys, it is immensely clinically useful and important, and I believe -- this is outside the realms of this particular thing -- but I believe it's a measurement which, if it were used more widely, would improve the management of children more widely, but not, as it happens, of children like Adam because his kidneys were not able to flexibly change.

MS ANYADIKE-DANES: Thank you.

I wonder if we can go back to the issue of dialysis records and prescription sheets because we've now looked at the original documents which are actually here. Firstly, if I can put up 057-015-021. That is a paediatric peritoneal dialysis prescription, but it is a sheet from paediatric intensive care.

A. Mm-hm.

Q. There is no comparable sheet for anything other than paediatric intensive care. Leaving aside that it is for paediatric intensive care, is that the sort of thing

that you anticipated would be kept and filled in for Adam?

A. Yes.

Q. Generally speaking?

A. Yes.

Q. Can I now call up 056-028-058? That would appear to be the only thing in the records other than the prescription sheet that I've just shown you from paediatric intensive care. Is that an adequate dialysis record?

A. Can we see the left-hand --

Q. It's the only one --

A. Can you see the left-hand side of the page, sorry? The pages I have on the screen, I can't see the most left-hand side columns.

Q. It starts at cycle number and strength.

THE CHAIRMAN: Can we make out the word that's cut off in what would be the top left-hand corner if the sheet was in the right direction?

MS ANYADIKE-DANES: Yes. I think we'll have to go and perhaps bring the original up to see what is in there. Maybe I will put that to one side until we do because it's not fair to ask you to express a view until you see it.

In terms of actual prescribing for it, treating it

as a drug, if I can put it that way -- the prescription sheets -- and I just have one and then the one that shows it's administered or recorded as an example. So if one looks at 057-051-108, that's a prescription sheet, and you can see the date, the drug, the dose and the time of administration --

A. Mm-hm.

Q. -- and other instructions.

A. Yes.

Q. But we have found no instance where that includes anything to do with dialysis.

A. Okay. The prescription sheet that you've put up here as an example of a drug prescription sheet looks as if it's a standard sheet.

Q. Exactly.

A. Right. It's very likely -- and certainly in our hospital -- that there wouldn't be a standard printed sheet for peritoneal dialysis that was arranged through the printers in the hospital. But what you would expect would be that the department would create its own A4 page which would have the same kind of information. So it would be a printed sheet headed, a bit like the previous --

Q. The paediatric one?

A. Yes. A bit like the intensive care one. The fact that

it's kind of home-made would be neither here nor there. It could even just be handwritten, but it would be a sheet on which it would say that they were prescribing a size bag, a concentration, and so on, those details.

Q. Yes. But if we put it up just once more, 057-015-021, that information down the left-hand side, is that the information that you want to see? Or is there other information?

A. It's slightly complicated because this dialysis prescription sheet is for manual dialysis, PD. Okay?

Q. Mm-hm.

A. Adam and most children who are chronically dialysed or dialysed with a machine, an automated machine, and the information that -- the specific information that you require would be different. Also, I've realised what that last sheet was ... The top box, which has "1.36", that stands for a dialysis fluid containing 1.36 per cent glucose. That's a standard bag. So that's the type of bag.

You would expect them to, on the sheet, say what the volume cycle was -- which actually appears further down -- but the next box you've got "duration cycle", those are instructions to a nurse to perform dialysis manually. I mean, peritoneal dialysis is very simply running fluid into the belly, leaving it for a while and

running it out again. So those are instructions to a nurse on how long to allow it to run and how long to let it dwell for and how long to let it drain for. The automatic machine would have sets of instructions, but you would tell the machine how many cycles over what period of time.

So it's a similar sheet, but actually requires slightly different information because this is information required to hand dialyse. The second sheet that you showed me, where we were looking for the left-hand side, I've realised is the recording sheet for manual peritoneal dialysis. In manual peritoneal dialysis, the volume of fluid that you run in is recorded, the volume of fluid that runs out is recorded by hand, by a nurse, after the duration of the cycle. And then the balance is calculated. That's what we were seeing and there was actually a note saying that the first cycle was bloody. This would have been the first peritoneal dialysis cycle done after the operation.

Q. Yes. Sorry, it's 056-028-058.

A. Yes. This is a sheet where a nurse is recording the progress of the dialysis. So you have the first cycle was 250 ml and they put in 250 ml. The machine withdrew 350 ml so that the child had lost 100 ml cycle balance. The appearance of it was blood-stained because the child

had just had surgery. "Overall cycle balance, minus 100 ml", so that first line tells you that the first cycle removed 100 ml, fluid. The second cycle removed another --

Q. So what I am trying to get at is this is not the prescription that you're talking about?

A. No, the prescription I'm talking about would be equivalent to the last one we were looking at, but asking for slightly different data.

Q. The reason for showing you that is that those are the only documents that we have.

A. These are documents that relate to manual peritoneal dialysis. And manual peritoneal dialysis would -- a child like Adam at home would be dialysed on a machine where it's a kind of standard cycle and, after surgery, would almost certainly be dialysed initially manually, ie a nurse running fluid in and out so they can make frequent adjustments for nursing convenience.

Q. Thank you. Your point is you would still have expected to see the prescription sheet?

A. Yes.

Q. Thank you. I wonder now if we can deal with consent, reasonably briefly, I hope, because you've --

MR FORTUNE: Sir, forgive me. Dr Coulthard has referred on more than one occasion to a prescription. Where would

the drug come from, sir? How would it be obtained, from the pharmacy? And if so, what would the pharmacy require to release the drug, whether to a junior doctor or to a nurse? Because presumably, a junior doctor or nurse cannot just go to the pharmacy and say, "Can I have such-and-such?"

THE CHAIRMAN: Please, can you take that?

A. Yes. You're right that it would be -- originally, it would be sourced from a pharmacy, but a renal ward that was used to dialysing children would have a stock or a supply on the ward of those bags of fluid in the same way that if you prescribed a common antibiotic for a child going onto a ward, you wouldn't have to go to a pharmacy to get it. The ward would have supplies of commonly-used medicines on the ward. But in a sense, it is a drug and it does come through pharmacy and it is prescribed through the same way. You have to write the size of the bag, the concentrations of the constituents.

MS ANYADIKE-DANES: Thank you. That's what we don't seem to have at the moment. We're looking for it, but it's not in his medical notes and records that we've received.

If I can go to consent. You, along with the other experts, the anaesthetist, Dr Haynes, and the surgeons, Professor Forsythe and Mr Rigg, have all expressed your views on consent in two ways. One, the actual process,

right from the moment when it is decided that the child will go on the register and, ultimately, hopefully, be the recipient of an offer for a kidney. And then also on the night -- well, when the offer is actually made and culminating in the formal signing of the document.

A. Mm-hm.

Q. That has been discussed from the point of view of the information that needs to be provided to the parents, discussed, so that they can make a proper and informed consent. If you've read the transcripts --

A. I have, yes.

Q. -- you'll see that we have introduced a document that was providing guidance -- I think it was dated 7 October 1995 -- and Professor Savage will say that that document and the guidance hadn't reached him at that stage. So leaving aside that, although the chairman has observed that clearly they were moving in that direction in more formal and fully-informed consent, in terms of the actual process and who should be involved in furnishing the information, if I can put it that way, I think that your view was -- and I think it's at 200-022-264.

Your view was that it was acceptable and appropriate that consent was taken by Dr Savage and not a surgeon, where there had been some prior surgical input. And

I think you had said that that's exactly what would happen in a case you wouldn't have a situation where there hadn't been any surgical input for all the reasons that you were explaining this morning.

A. Mm-hm.

Q. And Dr Haynes' view at 204-002-037 -- there's no need to pull it up -- was that he felt it was inappropriate that written consent was taken by the nephrologist and his pretty firm view in his evidence was that it ought to have been taken by the surgeon. Professor Forsythe and Mr Rigg were also of the view in their evidence that the surgeon should definitely have had an input and either have taken the consent or, less desirable, confirmed it afterwards, but in any event satisfied themselves.

Professor Koffman thinks that it is acceptable for the nephrologist in the mid-1990s -- and I think his view is that that is what was happening -- to take consent, although he said he would wish to view the consent form and the topics discussed with Adam's mother. And that is his report of 094-007-031.

So I don't propose to go through all of that because I think, apart from anything else, Dr Taylor said in his view that it was his usual practice to meet with patient, family, give them information, and Mr Keane, I think, also, I think, was of the view that he would

have ultimately, I think, met the family and doesn't move away from the fact that it would have been a good idea for the surgeon to have provided some information, although I think I started off by saying that he thought Professor Savage was more than capable of doing that.

The point that Mr Keane made was that Adam's mother didn't request to see him and what I wanted to ask you about that is: in your view, how significant is that or -- and you may not be able to answer this because it may be a surgeon's issue. How significant is it that she hadn't asked to see him or is that something that you, as a nephrologist, would be offering her or requiring the surgeon to be there, even?

A. Okay. In 1995, as happened here with Professor Savage, then Dr Savage, I personally took consent, very often on the night or on the occasion that the transplant was going to go ahead, without the surgeon being present, though fairly often the surgeon would come by, but not particularly with the intent of getting -- of being part of that process, but just in order to see the child and make a kind of social discussion about the parents and reassurance to the parents. The reason that I feel that is acceptable is because, as we've emphasised, these patient -- two things. One is that the patients have all seen the surgeons and had a discussion with

them. Secondly, because the paediatric nephrologist has a huge experience -- should have, in their training, have a huge experience of all the complications that could occur as part of transplantation and would be, in that sense, as well-informed.

That's what I've basically said in here.

Q. Yes.

A. The specific --

Q. Well, what's your view -- well, the specific question I asked you was: is it something that you think that the mother initiates, that she would like to see the surgeon, or do you, if you like, make that available to her?

A. I think that in the situation which I work in, I've not -- I would have said to the parents "I've come to take consent, you've seen the surgeon, you've had all that discussion, we'll go through it again, are you happy with that?" And I might say," Do you want to see the surgeon?" I might not, but that would kind of be implied. I think if I was facing getting consent from a mother for a transplant operation and the mother hadn't seen the surgeon at all, I would be very concerned about that and I would certainly offer that to the mother. I don't think the onus of responsibility for requiring that step to happen should fall with the

mother. The mother -- you would expect the mother is in a stressed state, her child's going to transplant surgery and, in a sense, it's unfair to expect a parent to demand a level of service. That level of service should be offered.

So if I was in the situation of talking about a transplant to a mother where they hadn't seen the surgeon, I would certainly want to offer it at that stage. Having said that, having said that, it is obvious that Dr Savage, as he was then, has known this mother for a very long time, has known her very well and dealt with all these things very thoroughly in the past. And it may well be that he has dealt with all the surgical issues, but I'd still feel uncomfortable, if she had never met the surgeon, to take consent without him being in any way involved.

Q. Thank you.

A. And yes, it would be up to the doctors to offer that.

THE CHAIRMAN: Both the surgeon and the anaesthetist have expressed regret that they did not follow the normal practice in seeing the mother before the operation.

A. I accept that.

THE CHAIRMAN: It's really a bit unreasonable to suggest that she should have been asking to see Dr Keane, isn't it?

A. Absolutely. It's the medical responsibility.

MS ANYADIKE-DANES: I wonder if I can move on to another point. So far as you can tell from the statements that you've read from Dr Taylor and from actually what happened in terms of what's recorded as having happened, how important do you think it would have been for the nephrologist to have satisfied himself that Dr Taylor actually understood Adam's condition? Earlier this morning, I think, you were talking about the discussion that you would have and the sort of things that you'd be saying: this is what I'm trying to achieve.

A. Yes.

Q. But that having been said, is there any onus on the nephrologist to satisfy himself that this information about this particular child in these circumstances, that this anaesthetist understands the implications of that?

A. Absolutely, yes.

MR FORTUNE: Could we tighten the question? Because we've got "circumstances", "the implications". What exactly is my learned friend asking Dr Coulthard to ensure?

MS ANYADIKE-DANES: I understand that.

Your view this morning, I think, was that there were two sorts of things that you needed to get over. You needed to get over the concentration of sodium or not in his urine and how much he passed and that would inform

you of, not only how you replace that, but also what sort of fluid you use to replace it. That was one, I think, discussion you wanted to have. The other discussion you wanted to have was, if you like, how much fluid you wanted him to have to keep him full, I think was your expression, and that that would be related to his CVP readings, particularly at the point in time when the clamps were going to be released and that was another discussion you would have.

So what I am asking you now is: in the course of that discussion, how important was it for the nephrologist to satisfy himself that the anaesthetist had understood the implications of what you had described as Adam's condition?

A. That is vital. That is absolutely vital. In a way, this is going to sound very pompous, but it's the way it actually is. The paediatric nephrologist regards themselves as the primary doctor looking after children with kidney problems and, in a sense, they remain in control of that at all times, except when it's wrested from them, as it were. And yes, if your child -- if the child that you've been looking after is then going to be out of your hands in terms of management for the period of a transplant, that's the only time that they're actually not going to be looked after by you directly or

indirectly, then you want to be absolutely certain that the people who look after them for that vital three or four hours knows exactly what I want of them.

And I tried to explain this morning that you would do that by having a clear conversation with the anaesthetist about, say, for the second component, which is keeping the child's vascular compartment full of fluid. You would make it very clear what you wanted and how you wanted that to be achieved and how you wanted it to be monitored, which is essentially that you use fluid in order to maintain the CVP at a prescribed level, and how long that conversation would go on and how deep and complex it would be would depend on the interaction with the anaesthetist. If it was an anaesthetist who made it very clear that that was his previous practice and he'd done this many times in adult transplants and he just wanted to know the details of what number you were aiming at in terms of pressure, then it would be a relatively short conversation because you could convince yourself with great certainty that you had got your point across. If it was somebody who seemed unsure about it, then that would become quite a long discussion, but you'd keep discussing it until you were quite clear that they had it fully understood.

Q. I suppose it's obvious, but from what you have said you

would not leave to chance, I presume, from what you said, the idea that the anaesthetist might not appreciate what Adam's urine output was?

A. No. You're right, I wouldn't leave it to chance.

Q. Dr Taylor has not at all criticised the information that he received from Professor Savage. He said that he received information, the problem was that he didn't apply it appropriately. What I'm trying to understand from you is: is the nature of your discussion with him such that the likelihood of that error, to fail to apply appropriately, is one that is reduced so far as you're concerned?

A. Almost to the point of eliminating -- I mean, as I say, there are two elements here. The element that we've just been talking about, which is keeping the child's vascular compartment full and monitoring that with CVP. It would be dealt with in the way I've just described. In terms of ensuring they get the urine component right, I would actually talk to them in terms of urine output in millilitres per hour. You could say that this child's daily urine output is about 1.5 litres, but then that involves a simple calculation of converting that to an hourly rate and, at the end of the day, you're asking an anaesthetist to look after a child for three or four hours and to prescribe an hourly rate.

The drip flow rates are not calibrated in millilitres per day, they're calibrated in millilitres per hour, and that's what you're going to replace it with. So I would automatically convert it in this case to 62 -- or whatever it was -- millilitres per hour of a fluid equivalent to half normal saline.

MR FORTUNE: My learned friend hasn't asked the question I have just mouthed at her. Would there be a note of that conversation?

MS ANYADIKE-DANES: I beg your pardon. The conversations that you have, particularly that which you said would be in some detail, would you make a note of it?

A. No, I don't think I would. I would ... What I'd be doing would be conveying what was in the transplant protocol and I would convey that in a discussion. I wouldn't write in the notes that I've done that, I don't think, no. That would be a conversation I'd have with the colleague. I would be clear that he understood what I wanted and that would be that. I don't think I would have written a note about that. I would have written a note that I've discussed it with the anaesthetist and that's fine, but "that's fine" would mean -- and I'm satisfied that we completely understand each other's requirements. In fact, in reality, this could be a telephone conversation, but in

reality, because the anaesthetists always do visit the children beforehand and because paediatric nephrologists are obsessive creatures who hang around a lot, I would always meet the anaesthetists in any case soon after the admission and you'd have a face-to-face discussion about it.

THE CHAIRMAN: Doctor, I just want to be clear about this because I want to be sure that I understand the extent, if any, to which you're being critical of Dr Savage on this; okay?

A. Okay.

THE CHAIRMAN: You talked earlier on about respecting the professionalism of colleagues and therefore it's not your function to spell out to an anaesthetist what his job is.

A. Mm.

THE CHAIRMAN: Dr Taylor, in his oral evidence here, which I think you have seen, has accepted that the responsibility for what happened was, to a considerable extent, his and he has not complained that he didn't have any information from Dr Savage or that he didn't have enough information. He knew specifically that Adam had a fixed urine output and he has said:

"I regret and I can't explain the false assumption I made about him passing 200 ml an hour."

Are you saying that, in light of that evidence and the other evidence which you've read, that you still think that Dr Savage should have gone further than he did?

A. I haven't said that I think Dr Savage should have gone further; I'm telling you what I would do. I don't know what Dr Savage did because he didn't record it and, indeed, I wouldn't have recorded it either. For me, the figure of 200 is completely inexplicable. I can't see how it could have arisen from information about an hourly rate or information about a daily rate. So I have no idea how that arose and, therefore, I have no idea what the conversation was between him and Dr Savage. I'm merely saying that's how I would carry it out.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: Thank you.

Just before we move on, Mr Chairman, we actually do now have the document which shows what was in the column.

THE CHAIRMAN: Is this the top left of the screen that was cut off; is that right?

MS ANYADIKE-DANES: Exactly, Mr Chairman. I'm just busily writing in the reference number. (Handed).

THE CHAIRMAN: What we had was the end of the word

"prescription". It's 056-026-058, please.

MS ANYADIKE-DANES: It is, but I don't think we will have this new version on the screen. I'm handing out copies and I can just say what it says. What should be there is "name" and then "prescription" and then "date" in that box next to the "cycle number and strength". And alongside "cycle 1" is the date of 25/08/94. Alongside "cycle 2" is the date of 25/08/94. So that's what was cut off in the photocopying.

A. What I was looking for was, in fact, whether there was a date and time, and it is, in fact, obvious that this was not -- I was guessing that this was the manual dialysis following his transplant, but in actual fact this is a manual dialysis at some time in August 1994 when presumably he's had some other surgery.

Q. Yes. In any event, it's not the document that you were expecting to see.

A. No.

Q. Thank you. I wonder if we can now move on, since we've just dipped back into dialysis, to an issue of the effect of dialysis. By that, I mean that Adam came in at roughly 8 o'clock or thereabouts into the hospital. He had eight cycles of his dialysis, which went up until 6 am.

A. Mm-hm.

Q. This is tied to another issue which I want to ask you about, which is deficit. In any event, how the issue arose with the various witness is: what is the likely impact of that dialysis on his fluid status, if I can put it that way, both in terms of his level of hydration and in terms of his serum sodium?

A. Okay. The impact of having eight rather than 15 cycles will be nowhere near the impact that you might guess if you were to assume a linear relationship. Because essentially, when a child starts dialysis, at the end of their ordinary day -- and this was effectively an ordinary day for him -- their volume status and their sodium concentration in their blood could vary up and down a bit because they may have drunk a lot at a children's party or they may have eaten some crisps or had some extra salt. And as soon as you start dialysis, at that point, the effectiveness of the dialysis is related to the abnormality of the physiology. If you just take the sodium, for example, if for example he had eaten a lot of crisps before and his plasma sodium had jumped up to the 150s, then in the first cycle the gradient between his blood, 150, and the concentration in the PD fluid would have been high and the first cycle would be very effective. Subsequent cycles would become less effective.

If you take an analogy. If you burn the toast and your room is full of smoke and you're going to deal with it by putting on a fan, the first five minutes of using the fan will clear an awful lot of the smoke and the smell, the next five minutes less so and so on. So if you're going to ask how much difference would it make having the fan on for quarter of an hour rather than two hours, it's not a linear relationship. So peritoneal dialysis is most effective when it's, as it were, most needed, when the perturbation in the child's physiology is most extreme, which is after a day of not being dialysed. So the first eight cycles will do the vast majority of the work and therefore it wouldn't concern me very much at all. And indeed, many children who are on regular peritoneal dialysis don't complete cycles for a number of reasons: they might go to bed late and get up early for this and that, and it really doesn't alter the day-to-day management of children. It's not critical.

Q. Thank you. I wonder if we might then lead into something else which was an issue for the witnesses and that is the extent to which Adam was likely to have a deficit, or whether his peritoneal dialysis would have had time to redress any deficit.

If I just tell you the context in which this arose.

This arises because Professor Savage -- and to some extent following on from him, Dr Taylor -- have said: well, if you applied his fluid management over a 24-hour period, then, in their view, he would have come to theatre somewhere 300 to 500 ml in deficit.

If, on the other hand, you had looked at his fluid status, if I can put it that way, only from his admission to when he went to theatre, then he wasn't in deficit; he was either about even or maybe slightly over, and you will have seen those charts that -- well, you filled one in and all the others dealing with this aspect of Adam's care have filled them in.

A. Indeed.

Q. And you can see -- because there's a comparative one -- the differences between you. This is one that Professor Savage made a note over and said: well, whether he was in deficit or not rather depends on how you look at his cycle, if I can put it that way.

You provided a paper or a note on 17 April. The reference for it is 200-023-001. There we are. I don't want to be reading into the whole thing, but just to flag up and then if you can help us understand your position.

A. Mm-hm.

Q. Under 2(a), and this is dealing directly with these

charts that I've mentioned, you say:

"The first approach is to take the previous 24 hours' estimated fluid intake and then deduct from it the estimated usual urine output."

And so forth. And you have addressed Professor Savage's argument on that basis. Then (b):

"The second approach is to take the most recent point of clinical assessment and to work forward from there."

And after that paragraph, you address Professor Savage's conclusions about that. In fact, you can see the difference there it makes because you've got the figures.

A. Mm-hm.

Q. So I wonder if you can explain how you thought Adam's fluid status should actually have been assessed so that you can have that discussion with the anaesthetist and tell the anaesthetist what the fluid status of Adam was as he came to theatre.

A. I would always use the second approach. When you're trying to assess a child's fluid balance and to try and predict where it's going to go by your management, what you ideally want to do is to have a concrete starting point of assessment and then to make adjustments and to reassess after the shortest possible interval. The fact

that -- using a 24-hour period is something that you are sometimes forced into if you have no other intermediate information. It makes all sorts of assumptions about what happened during many hours when the child wasn't in hospital and under your care and being observed by you.

What makes, in my view, much more sense is to examine the child and make an assessment of the child's clinical condition in relation to their fluid balance as near as you can to the surgery. What, in practice, that means is that when the child is admitted, you examine the child and look for evidence of their fluid status and make a clinical assessment of their fluid status.

Having done so, you then prescribe your management and then re-examine them after you've completed your treatment. So in this particular instance, I would examine him when he comes in and it's clear from the examination when he was admitted that the doctors thought that he was clinically in balance, that he wasn't dehydrated at that point.

THE CHAIRMAN: Because that's in keeping with his mother looking after him?

A. No because it is in keeping with -- you can get rid of all those assumptions because it is in keeping with your clinical assessment at the time. When you examine a child, there are a number of features about the child

which allow you to judge whether the child is dehydrated. If a child has a moist tongue, moist lips and they look fine and their skin turgor is normal and they have warm hands and feet, which implies that they are pumping blood effectively to their peripheries, you can say that they're either not at all dehydrated or minimally dehydrated, not an amount that clinically matters.

Everything that happens before then becomes irrelevant because you have a starting point where you can peg it on. Debra Slavin, I have never met her, but it comes across from the notes that she's a very caring and meticulous mum, but it is perfectly possible when she is looking the other way that he might have an extra drink of pop or something.

So all those uncertainties disappear completely when at 8 o'clock at night 10 o'clock at night -- whenever it was -- you examine him and you decide that he's in fluid balance, then that's your starting point, and there's no need to make all the prior assumptions. What you then do --

MS ANYADIKE-DANES: Sorry, pause there. In aid of the chairman, when he said that was consistent with his mother's care, actually Adam took nothing by mouth; he was fed entirely through his gastrostomy tube. So

all of that was actually controlled, so I think what the chairman was getting at is that's all being controlled, his dialysis is all being controlled and your physical examination is just effectively linked up with that.

A. While I understand that, there are also variables that we and she may not know about. For example, if you do a clinic in the summer, you'll find when you look at the peritoneal dialysis fluid volumes that children dialyse less fluid off. That's because they are relatively dry because they sweat more. If it's a hot day or a cool day, it's very difficult to -- what you're doing is you have a good mum and a lot of control in the sense that the child's intake is regularly controlled, but you've also got other variables. Who knows? It might have been a hot day or whatever.

The point is, in Adam's case, it may well have been quite a useful tool to do that. In some cases it isn't and it is unreliable to use that as your primary measure just because it might happen to work quite well in Adam because he's got a particularly reliable mother. So what you do is you use a method which works for everybody.

So when a child comes in and they are clinically dehydrated, when they come in you think that their mouth isn't as moist as it ought to be, that their limbs are

cooler peripherally than you'd expect. Then you would say: this child is X per cent dry and you would add to your prescription an infusion of some saline or some extra fluid into his gastrostomy. And then, later on, later in the night, you'd look at him again and decide whether or not you've done enough or do a bit more and again in the morning. So it's an ongoing process. There is no need to guess in a way whether somebody's going to theatre dehydrated because you can see them and examine them.

I, in that situation, would examine him when he comes in, write up the fluid management as far as you can -- obviously, there are difficulties with drips and so on and we know that -- and then run that as close as I can and then look at him and as you approach the time of surgery and see whether you need to make any adjustments.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: Okay. Well, staying there with the deficit, it seems that from their way of assessing it, both Professor Savage and Dr Taylor thought that Adam was slightly in deficit somewhere between 300 ml to 500 ml. Is there then for the anaesthetist or for the nephrologist an issue as to how quickly that is recovered? Who is the person who has to address it,

first, and, given that person, how quickly is it something that has to be redressed?

A. Okay. Delivering the child to theatre in appropriate fluid balance, which means slightly replete, is the responsibility of the paediatric nephrologist. So he's got all night to, in this case, because of the decision to operate in the morning, to ensure that the child doesn't go to the theatre dehydrated. If they think at the end of that, because of particular difficulties, they have done so, then that would be a discussion between the paediatric nephrologist and the anaesthetist handing over that information. They would say, "I think we've tried to get him replete, but I think because of the drip problems and what have you, he might 300 ml down; can you deal with it when you have your drip in because there was a problem with the drip?" What you would then suggest is that as soon as he had his line put it, he could be filled up and that volume -- 200, 300 ml -- could be given very quickly -- quarter of an hour, half an hour -- as long as it's given with isotonic or a fluid which has got a normal plasma sodium, thus a normal sodium concentration.

It wouldn't matter how -- you could give ... That sort of volume you could give in quarter of an hour, half an hour. The 300 ml, you could give, maybe 200,

300 ml, have a look at him again, maybe give another 200, 300 ml. It's an ongoing process, an hour by hour, minute by minute process.

Q. Okay. If we go to actually what happened. As you know, it's recorded that the cannula tissued so the IV access was lost in that way. That's part of the reason why the management Professor Savage would have wanted to have of his fluid, sending him to theatre in that condition couldn't happen and he actually went there, in his view -- although I understand it's not your view -- slightly dehydrated by that 300 to 500 or whatever it was. So after he's had that discussion, we also know, because Dr Taylor has said so, that not only did he think he had to make up that kind of deficit, but he was also mistaken as to what he would have to manage in terms of Adam's urine output.

He thought he was managing 200 ml an hour or thereabouts in terms of his urine output. So if that were the case, assuming he was right -- I know you don't -- you can't accept that that's the position, but assuming he was right and Adam was dehydrated to that level and he had an urine output of that type, then what is the appropriate thing to have done in terms of managing his fluids and the rate at which you do it?

A. Okay. That's a ...

THE CHAIRMAN: Sorry, have you not given me the answer to the first part, that it is the anaesthetist who can remedy a small deficit with a small extra volume of a fluid of the isotonic type at the start?

A. What I'm saying is if the child was considered short of fluid on arrival in theatre, that could be remedied very quickly. I'm talking about 300 ml, say, in about quarter of an hour, half an hour, that sort of time and, if necessary, an extra bit as long as that fluid had a normal sodium concentration.

THE CHAIRMAN: Yes.

A. The next bit is quite complicated because there are so many ifs and buts conflicting and make the scenario you're giving me a clinically impossible one in a sense. Let me takes you first of all to the fact that there is -- I don't want to divert the thing, but it is maybe helpful for you to know that there is a very, very rare condition in which children as small as Adam do produce very, very dilute urine at about 200 ml an hour. Okay? They don't have kidney failure; it's a condition called nephrogenic diabetes insipidus. It happens, it's very rare and children of his age will then drink 4 litres, 5 litres a day. That's a vast, vast amount, 200 ml an hour. If, while we were sitting here having this conversation, he would have to have with him some Coke

bottles of water, large 2-litre bottles, and he would be drinking from it, and they wake up every hour or two. If you really were in that situation, which some children are, the message that we give to parents and the doctors who look after them, a child in that situation cannot go without fluid for two hours. The child would have to go to school with bags of fluid, they'd have lots of water at school and he'd just be allowed to drink, drink, drink, drink and go and pee and drink and pee and drink and pee and drink. That's their life and it's a pretty grim condition. In a way, that theoretical situation does happen and it is so dangerous that the -- if you take a child with NDI, with this condition, to theatre for something, they would have to have a drip up constantly.

If you were telephoned in the middle of the night about a kid that you were going to have to do surgery on and you want him fasted, you would have to put a drip up -- you couldn't discuss whether you'd make it up in the morning -- and you'd have to replace that with 5 per cent dextrose or fifth normal, 0.18 per cent, saline to match the urine. So theoretically, that's what you would do in that rare situation. We are so far from that situation it's untrue because if Dr Taylor's assumption, as I have read it, is that between 5 am --

the reason ... If you actually go to Professor Savage's calculation, he ends up with minus 298 ml, so 300. The 300 to 500 it seems to me comes in from the additional assumption that professor -- Dr Taylor is making that this boy is losing 200 ml -- most of it water -- every hour, so between 5 and 6 and he's got 7 to 8, it's a potential disaster, which indeed if he had NDI, it would be the case, but they wouldn't have managed like that.

Had that been the case, he would have had a drip going all the time, okay? It's a completely different situation. The reality is that if you have -- and a child like that could not be allowed to go without water any time of day or night. We're not dealing with that situation. We're dealing with a boy where 200 ml an hour is so unrealistic, I can't really answer your question in a sort of sensible manner. The fact is that everybody accepts, including Dr Taylor, that at the time that this boy finished his dialysis, his plasma sodium -- although it wasn't measured for various reasons, I know -- but his plasma sodium was likely to be normal or very nearly normal. It always was every morning, eight cycles against 15 cycles -- it doesn't matter that much -- the sodium would start off normal.

So if the sodium starts off normal and then two

hours later, you've managed to get a line in, at 7 o'clock you're going to give him fluid, there is absolutely no logical basis for then arguing that, in order to replace his deficit, which you think has happened, you have to give him lots and lots of water. Because we started off an hour or two ago with a normal sodium.

THE CHAIRMAN: And ultimately, therefore, you are not surprised that Dr Taylor has come to recognise that he got this catastrophically wrong?

A. Absolutely. It's such a catastrophic -- if you use that word -- discrepancy that me trying to explain to you how you would deal with that situation, it's just impossible. The logical situation would be that if a child starts off with a normal sodium at 5 o'clock in the morning when he comes off his dialysis and unless he's got NDI --

MS ANYADIKE-DANES: 6 o'clock in fact.

A. 5 o'clock, 6 o'clock, whatever. Unless he has NDI, this unbelievably rare condition which you'd manage in a completely different way, then it would be completely unreasonable to assume that, by 7 o'clock, his plasma sodium was catastrophically abnormal. After all, on a normal day between 5 o'clock or when he gets up at 7 o'clock, by the time it's 9 o'clock, he's not in need

of resuscitation. So the idea that that would lead to him requiring resuscitation with a dilute fluid makes no sense.

Q. Sorry, can we just be clear about that because I think you've just addressed two issues.

A. Sorry, it is a complex area.

Q. Leaving aside whether he was or was not in deficit, the first issue you have addressed, which Dr Taylor has clearly acknowledged, which is that Adam couldn't really have an urine output of 200 ml an hour. That's the first.

A. Okay.

Q. I think that's what you're saying.

A. Yes.

Q. And then I think that Dr Taylor went on to acknowledge something that he had also been in error over in all his previous statements, which is not only couldn't he have that, but he also couldn't have a response which led to an almost unlimited response to the production of urine, that his particular condition meant that he had a fixed urine output.

A. Yes.

Q. Yes. Then the third thing that you've talked about is, even if he acknowledged all of that, you've introduced another thing, which is not so clear whether he has

actually acknowledged, which is that even if all of that was the case, he still shouldn't have been replacing the loss that he thought had occurred with the fluids he actually did replace them with. Because of the kind of loss that was suffered, it was completely inappropriate -- irrespective of whether it was 200 ml or not -- to use those sorts of fluids; is that what you're saying?

A. That's what I'm saying. If I could just -- the point about --

MR UBEROI: I think Dr Taylor has certainly accepted that, with hindsight, the wrong fluid was used as well.

MS ANYADIKE-DANES: It's a matter of why it was --

A. Sorry, I'm aware it's a complex area and I'm sorry to have to labour this. But the point that I'm making is in Dr Taylor's and Dr Savage's assessment, by the time he got to finishing his dialysis, he was 300 ml depleted. I think they're wrong, but let's assume they were right. The question you then have to ask is: what is he depleted of? He's depleted of 300 ml, but what's he depleted of with respect to sodium? If his plasma sodium is normal and he's 300 ml short, then he must be depleted of 300 ml of fluid containing a sodium that is normal.

If he was depleted at the end of his dialysis of 300 ml of fluid, which was equivalent to the

concentration of sodium that he was losing in his urine, then he would have got a huge water deficiency in relation to his salt and therefore he would have been hypernatraemic. For that to be true, he would have to have had a very high plasma sodium at the end of dialysis and nobody's suggesting that. So whether or not the extra 200 ml was to do with urine at the end, the fact is that if you end up at 300 ml deficient at the end of dialysis when his sodium is normal, then you must be short of 300 ml of normal saline.

THE CHAIRMAN: Okay. Thank you very much. We'll break for 15 minutes and then sit until 4.30.

(3.32 pm)

(A short break)

(3.50 pm)

MS ANYADIKE-DANES: I wonder if we could move now to the nephrologist's presence in and around the theatre.

Professor Savage has said that he -- he said that in his evidence on 18 April -- regarded himself as providing a supportive role for the clinicians if they had any queries and also for the mother, Adam's mother, being in a position to report back to her on what was happening.

He said that he would ask surgeons how things were going. He also made sure that the immunosuppressant

drugs were given at the right time. At least that's what he regarded as a nephrologist's role.

Dr O'Connor said, in Bristol, it wasn't the policy of the nephrologist to go into theatre and she had asked colleagues in the UK about that and their different policies -- some do and some don't -- and she gave her evidence on that on 25 April. I'm not going to go through that.

But in your report of 200-007, in that particular report, you do discuss being in the theatre. Also at 200-007-111, you describe the consultant paediatric nephrologist as a main medical carer for children with end-stage renal failure and I think that's something you were explaining to the chairman earlier on.

A. Mm-hm.

Q. And that you have this sort of continuing role apart from when the child is wrested out of your control from the time in the operating theatre and then you take a rather prescriptive view as to what's going to happen there. Does that fairly summarise your attitude?

A. That's a good summary, yes.

Q. At 117, though, you deal specifically with nephrologists being in the operating theatre during the transplant surgery. You say, much like Professor Savage actually, that mainly -- you do it intermittently and it's mainly

to be able to provide feedback to the parents on their child's progress. Then you say:

"But sometimes it also involves entering into medical discussions with the anaesthetist and surgeons about particular aspects of the child's ongoing care."

What sort of thing might that be that would cause you to get into a discussion with the anaesthetist and/or the surgeon?

A. Okay. I just put the context of this, that my visits to the theatre, spontaneous visits to the theatre, are always purely social in the sense that I'm wanting to gather feedback for the parents as to how things are, and obviously I'm always available on call so if they have a specific problem, they would call me. What I was referring to in this context is that sometimes when you go to theatre and just -- "How are things going?" And there may be discussions about particular issues. For example, the surgeons might say that, "This child's artery was quite difficult to visualise", or, "I'm wondering what angle I'm going to put this kidney in at". They're just kind of chatting and talking aloud and maybe sharing some concerns, but it's not really a kind of consultation as such, usually. It's usually just a kind of --

Q. I take the usual point and I think I'm dealing with

a situation I think you would regard as not being usual. You say:

"Sometimes it involves entering into medical discussions with the anaesthetists and surgeons about particular aspects of the child's ongoing care."

Does it go past a social discussion about, "Shall we put the kidney there or shall we put it here?" I'm trying to find out what you actually meant by that.

A. Issues like that, but also the anaesthetist might, if we're thinking about fluids, observe the amount of fluid that they've needed to give to get the CVP to where it was and we might discuss whether -- they might, for example, be concerned that that was rather a lot, say, and you might discuss that as to whether it really was a lot and how you would manage that. So there may be discussions about details of the way that things are being managed, but those are always -- in this context, not being called to theatre by them for a particular issue, they would always be kind of discussions about giving an opinion on somebody else's area because they maybe value your opinion, you've seen many more transplants. So they'll say, "Do you often see that?", "Yes, that's okay". It's that kind of interaction rather than a serious -- I can't recall going and having a "Good job you're here because --

Q. Have you ever been called to theatre --
A. Of course. You get called to theatre if there's a problem they might phone you --
Q. So this is different?
A. Yes.
Q. This is your own initiated visits, just going to see what's going on, and while you're there, something arises and you get into a discussion and you contrast that with actually been called --
A. Called to theatre.
Q. Professor Forsythe and Mr Rigg said, for example, if an issue did arise about the CVP, they might ask the nephrologist to come to theatre and have that discussion --
A. Absolutely --
Q. -- with the anaesthetist while they're getting on with their job of the surgical end of things, if I can put it that way.
A. Calls of that nature about substantive issues certainly occur during transplantation and the nephrologist is always -- you always avail yourself to be able to come and deal with those.
Q. Well, let's move forward to a matter that was discussed now that I've mentioned CVP, specifically in relation to CVP. This is, I think, worth going to. This is

Dr O'Connor's evidence on 25 April. It starts at page 84, line 22. The context of this is, as I'm sure you're aware, that in Dr O'Connor's witness statement she referred to the fact that she had noted that the CVP reading was 30 and she had raised that with Dr Taylor and he had given her an explanation as to what -- not only why it might be that figure, but also what it had started off with and what his view of it was and how he was, so far as I understand it, how he was using the CVP measurement.

During the course of her evidence, I think she acknowledged that a situation had arisen where nobody in the operating theatre actually knew what Adam's CVP was. The surgeon couldn't know because, if the anaesthetist didn't know, then that's where he's going to get his information from. The anaesthetist was saying that he didn't know what the absolute figure of Adam's CVP was and, of course, she didn't know because she was dependent on the explanations being given to her by the anaesthetist.

So what I wanted to ask you is, if that's the situation and she accepted, as she said she did in her evidence, the explanation given by Dr Taylor, what responsibility or obligation, if any, does the nephrologist in those circumstances have to take matters

a little further than accepting the explanation given by the consultant anaesthetist?

A. To discover that the CVP was reading a value which was way outside the range that you were expecting and, furthermore, that it was apparently not working properly, would be a very, very serious problem. On the one hand, if the CVP was actually -- if the reading can't be relied on, if the CVP is too low, then there's a substantially increased chance that the kidney will clot. And if the CVP is just driven blindly too high, then there's a substantial chance that the child could be pushed into fluid getting into his lungs and pulmonary oedema. The importance of CVP is that it guides you along a line which is quite narrow and quite critical. So the absence of it would be a major worry, and I would want to establish with the anaesthetist what the specific problem was with measuring the CVP.

Q. When you say "discover", what would that involve?

A. Obviously, an initial discussion with the anaesthetist's impression of what the problem was, but in terms of what I would then -- and it sounds like that wasn't getting a substantial answer. Then you would troubleshoot. And the first thing that you do when you troubleshoot what is wrong with the CVP is that you look at the trace of the pressure in real time on the monitor.

The reason for that, the CVP, broadly, can be too high for three reasons. One is that it might be -- it can be 30 for three reasons. One is that there may be a medical problem and it genuinely is 30. That would be very, very worrying. The second reason might be that the line wasn't actually measuring the central venous pressure but was jammed into a vein and was measuring the pressure in another part of the body -- the neck or the head -- because it wasn't communicating. The third reason could be that it was recording a reflection of the CVP, but may not be properly adjusted or calibrated or there could be -- in other words, there is a technical problem converting the pressure wave in the transducer to a meaningful number on the screen. So those are the three issues.

Q. Of those three, Dr Taylor thought it was the second, the jammed into the --

A. That's right, yes. That's right. To distinguish that from there being something wrong with the actual reading of a genuinely -- a patent line, you would look at the real-time trace. That is to say, central venous pressure isn't a static pressure, it's the pressure in the veins, in your chest, and the pressure in your chest varies, firstly, with respiration as the ventilator gives positive pressure -- ventilation actually changes

the pressure in your chest and so you see a change in the trace related in time to the respiratory movements and, in addition to that, because it's right next to the heart, it transmits some pressure waves from the heart. So the CVP has a smooth curve from the respiratory trace and, on top of that, an additional curve.

If you see that, what that tells you is that the line, the lumen of the line which is connected to the pressure transducer, is in fluid contact with the central veins. Whether it goes up to the neck or whatever, it wouldn't matter. It means that there is not an obstruction and there is a direct pressure transmission from the central veins. That's the first thing you'd look at. If that is flat, it tells you that the line is jammed in somewhere and then you would want to try and manoeuvre it and get it so that it did work.

If it wasn't flat, then you're left with the two possibilities that either the central venous pressure genuinely is 30, which would be pretty staggering and very worrying, or that although the pressure trace is being recorded, somehow the true calibration isn't in place.

Q. Just before you move on, in fairness to Dr O'Connor, her view is that's not her expertise. She would know what number she was trying to achieve, but the actual

interpretation -- and I think to some extent Professor Savage said something slightly similar and certainly Mr Keane said something slightly similar -- of all that, that's the skill and role of the anaesthetist. They would know what numbers they were trying to achieve but not necessarily to be able to deduce -- I think you've called it troubleshooting -- from the wave pattern or absence of wave pattern that you would see on the printout.

A. I can't agree with that. The reason I can't agree with that is -- well, two fundamental reasons. One is that understanding the concept of a CVP trace is very, very basic and it would be something that you would learn about in physiology in your first year at medical school. So it's not a complex issue. That's the first reason why I'd be surprised at that. But more substantially, in the day or two or three, depending on the stability of the child and the precise situation of the -- day, two or three, after the kidney transplant, the paediatric nephrologist is back in the driving seat, if I can use that term, and is continuing to manage the child with the CVP monitor.

The CVP monitor is a tool for paediatric intensivists or paediatric doctors who are looking after children in intensive care or following a transplant.

I would not consider somebody to be trained as a paediatric nephrologist if they weren't able to understand and troubleshoot a CVP trace. The day after the transplant it is you and the patient and the nurses.

Q. So the first port of call, I think you were saying, is that you have a look at the printout?

A. You look at the trace actually on the monitor.

Q. Sorry, the trace on the monitor.

A. Yes, because that's real time. There will be a sweep going across of the trace and a number giving you a mean value. It kind of flattens off those figures.

Q. Let's also put this in context. You have expressed the view that one treads carefully in other people's disciplines, if I can put it that way, so you've come into the operating theatre. The person who is managing, at that stage, Adam's fluid status is the consultant paediatric anaesthetist. He has assessed the situation and given you an explanation. So in those circumstances, I think that's what I want you to help us with, are you saying that irrespective of that, nonetheless there is an obligation -- or duty, even -- on the part of the nephrologist coming in to, if you like, check the explanation that is being given is one that satisfies them, if I can put it that way?

A. Absolutely. The prime responsibility -- your prime

responsibility as a paediatric nephrologist is to look after your patients and not necessarily be too concerned about the sensitivities of your colleagues, although obviously you would try to deal with these issues as sensitively as you could. But if you were actually in a situation where you were going through a transplant in a child and didn't have a CVP monitor result that you could believe and the anaesthetist wasn't able to solve it, then you would definitely, without a question, offer to contribute to solving it. You would put your heads together and solve it. You could not leave it unsolved because the situation is too dangerous for the child.

Q. And would you advise a surgeon of that?

A. I would have the discussion with the anaesthetist and try it solve it. Obviously, if at the end of the day you couldn't solve it, I'm sure -- well, I'm not sure. My best analysis of the situation that arose here is that it could have been solved, but that's for reasons which I've expressed in a previous report. Whether it could have been solved or couldn't have been solved, the first thing to do is to solve it with the anaesthetist. If you can troubleshoot that in 5 minutes, then it's problem solved. If you can't solve it and the anaesthetist can't solve it, then it's an issue for the whole team, the surgeon and everybody.

You know, there would then be a discussion of how you would move next, there'd be a number of options.

Q. Even if you formed the view that the surgery is so far advanced, what can be done at that stage?

A. The first thing is that what may be doable at that stage is simply to manage the way in which the CVP monitoring process is being carried out, check the calibration, for example, check the electronics. There's a number of -- I mean, I can take you through those steps, they're fairly simple steps.

If at that point, you reach the conclusion that this CVP line was not usable, then I think you would then have to share that and that would be a joint decision between the surgeon, the paediatric nephrologist and the anaesthetist. My personal view on that would be one of great concern because you don't just need the CVP to be right when you open the clamps, you have to take the child through after that. If you have a CVP that's genuinely too high, then will you be able to extubate the child, will they develop pulmonary oedema? It's not just an issue just for that moment. I know everybody's emphasised the issue at that moment and that is a crucial time, but once you have passed that point, it's by no means done and dusted, which is why I was saying that I don't think that a paediatric nephrologist can

really practice without knowing how to manage a CVP because you depend on it for the next two or three days.

THE CHAIRMAN: I understand that point, doctor, I think, but isn't there a bit of uncertainty here because we don't actually know at that time Dr O'Connor had this conversation with Dr Taylor?

A. In my view, sir, whatever time it was that it was discovered that the CVP wouldn't working, whatever time it was -- at the beginning of the operation, prior to the clamps or whatever -- at that point, it should have been addressed and dealt with.

THE CHAIRMAN: The only person who appears to have become aware of it beyond Dr Taylor, on evidence so far, was Dr O'Connor. Dr Savage didn't know about it. Doing the best we can with times, I don't think Dr O'Connor arrives until ... She goes into theatre -- it can't be before about 9.30 by the time she comes in. She finds out about the operation, she has to go her room and get rid of her bag and so on and it looks about 9.30 --

MS ANYADIKE-DANES: I think it's -- I thought it was about 9.15-ish, about that time.

MR FORTUNE: [Inaudible: no microphone] in the bracket between 9.15 and 9.30 because it's around that time that Professor Savage goes off to the university.

THE CHAIRMAN: Yes, but do we know that it was on her first

visit to the theatre that Dr O'Connor learned about the CVP line?

MR FORTUNE: As far as I can recall, there's no evidence.

THE CHAIRMAN: She wasn't sure about when. She said she learned about it at some point, but she didn't know on which of her visits she learned about it.

MS ANYADIKE-DANES: It was certainly before the release of the clamps, but I don't think she did pin it down as to the time of it.

A. If I understand this discussion correctly, the suggestion is that it may have been up to a hour before release of the clamps; am I understanding that correctly?

THE CHAIRMAN: It may have been, but "may" is heavily conditional.

A. To be honest, sir, my feeling is that there are a number of ways in which the CVP not working may have been solved without, for example, having to go to the extremes of, as people have suggested, putting in a femoral line.

THE CHAIRMAN: Okay.

A. I think that those should have been explored at whatever time that was in the procedure.

MR FORTUNE: Sir, can I just come back to one matter my learned friend referred to? That was in relation to the

CVP and Professor Savage as to what he would know as a consultant nephrologist. From recollection -- and I've had a brief look through what I believe to be the relevant parts of the transcript -- Professor Savage was not asked about his knowledge of CVPs, how to manage them, if there was a problem. And indeed, his evidence --

THE CHAIRMAN: I think it was Dr O'Connor that Ms Anyadike-Danes referred to, not Dr Savage.

MR FORTUNE: Yes, but my learned friend referred to Professor Savage as well in the same sentence.

MS ANYADIKE-DANES: I beg your pardon. I think the appropriate people I meant to refer to, one, is Dr O'Connor and, two, is Mr Keane. I think both those people express themselves as being not so au fait with looking at the trace and being able to interpret it. I don't think Professor Savage was asked about that --

MR FORTUNE: Yes, and there is no evidence to say he wasn't au fait with the concept of CVP and its management. That's just what I wanted to clear up.

MS ANYADIKE-DANES: I think that's right. I don't think he was asked about that.

MR FORTUNE: Thank you.

MS ANYADIKE-DANES: In any event, the focus of this really is Dr O'Connor. She is the person who receives the

explanation and acts in the way that she does, if I can put it that way.

In answer to you, Mr Chairman, I don't think that we can pin down exactly when Dr O'Connor was looking at the CVP.

Can I just take you, now that we're thinking about that, to page 84? Her evidence is all on 25 April. If we go to page 84. Then if we perhaps start at line 11, she says:

"So I would not have been present to make an assessment of the accuracy of the CVP, nor was I qualified to make an assessment of the accuracy of the CVP because that is within the realm of the competency and training of an anaesthetist and is not within the realm of the competency and training of myself to assess the accuracy of a CVP."

So that's where she starts that comment. Then the question is:

"Question: Did you refer to having concerns about it, the CVP at 30?

"Answer: I imagine, although I don't know that, at the time, I would have bothered to look at the CVP. That would have been prior to the clamps being released."

So that's as close as we can get to it. It doesn't

mean that she didn't have that information earlier, but it certainly seems that she had it by then. Her note, her marginal note, in Adam's medical notes and records is "Vascular anastomoses, approximately 10.30". She has equated that as the release of clamps. So as best as we can do, it's in or around that time, if not earlier.

A. Right. My point that I was trying to make earlier is that the CVP does not -- is not only vital for the time that the clamps are released. If the CVP genuinely had been 30, then as the paediatric nephrologist, I would be very concerned that that would give the child a very, very high risk of developing pulmonary oedema in the immediate post-operative period,which would alter the way that we manage them. For example, we probably wouldn't ask the anaesthetist to extubate, to stop the ventilator, but would carry on the ventilator in intensive care to prevent pulmonary oedema developing, and alter the fluids and give -- there would be a whole range of ways in which you would alter your management.

It's not just the clamps. You need a CVP measurement throughout the entire period of transplantation. I can recall a case where a child came back from theatre and the CVP line started to stop functioning on the transfer back and we had to troubleshoot it and get it going after that because

we're still dependent on it for a variety of reasons. It's not just that the time of the clamps -- although the time of the clamps is crucial.

So whenever you, as a paediatric nephrologist, were to find the CVP is not working, you would ask the anaesthetist to deal with it and, if they weren't able to solve it, you'd troubleshoot it with them. You'd share that responsibility.

Q. Just to summarise, it's always important whenever you find it?

A. Yes.

Q. It just means different sorts of things if you find it at different stages in terms of what you do about it, but it's always important?

A. It's always important.

Q. If you can't identify what the problem is with the CVP line, I think you said, at that stage, you raise it with the surgeon because you and the anaesthetist together have not been able to resolve it.

A. Yes, the significance of having a CVP that high, if it's genuine or the significance of not knowing the CVP is important and would have to be shared by the whole team. The surgeon, I would imagine -- well, in my experience, the surgeon would definitely want to know it was a problem when he's operating, so it would involve the

team.

Q. And just because of where I started from, does that mean that you regard the nephrologist as having -- how would you couch it -- a duty, an obligation, a responsibility in that regard to check?

A. It's your duty to the patient to continue to manage them and, when they're in theatre, they're having shared care between yourself and other colleagues, including an anaesthetist, but they remain always your responsibility.

Q. Thank you. I've just been asked to cover a point with you that I don't think I did cover and I apologise. It's to do with -- sorry to take you out of order, but just to make sure I don't forget it -- the preoperative ultrasound. When you had talked about the issue of multiple lines that many children in Adam's circumstances come to theatre having had a number of central lines and that that's one of the things that you manage, if I can put it that way --

A. Mm-hm.

Q. -- and discuss. An issue is whether you would, in the course of your discussions in these meetings, have discussed the possibility of a preoperative ultrasound examination in 1995.

A. In 1995, we may have done. But earlier in --

historically, the less likely it would have been to do it, and I think, in 1995, I would definitely have wanted it done in a child that had a specific history of a thrombosis in the neck. Otherwise, just because they've had two or three lines before, I probably, in 1995, wouldn't have requested it. We would now, but I don't think in 1995 we would.

Q. Thank you. I wonder if I could address with you the issue of the administration of dopamine. If I can take you first to where it's referred to by Dr Taylor and then ask for your comments. I don't think we've actually found it in his medical notes and records as having been prescribed; I'm subject to correction. But in his deposition for the coroner at 011-014-101, eight lines down, starting seven lines down:

"There are two small increases in the systolic blood pressure at around 10 am, corresponding to two small boluses of dopamine."

And he says:

"The rationale for this was to increase the perfusion pressure (without fluid challenge) to the donor kidney, which at that stage was not looking good and not producing urine."

Can you comment on its use? If it's outside your area, do say, but can you comment on its use?

A. It's outside my area in the sense that I would be unlikely to prescribe it. My experience is that it is used as a -- it's a drug related to -- a little bit like adrenaline. It improves the way your heart beats and has a very slight impact on increasing the blood flow specifically within the kidneys. So on theoretical grounds, it's a drug that can be used if a child's blood pressure is not ideal and you are concerned about kidney perfusion. My own feeling is that it's pretty ineffective. It's a drug that anaesthetists will often add at that stage. It's something I wouldn't challenge in any way at all. It seems a conventional technique.

Q. But if it was being used for the reason that Dr Taylor said, then that might help, I suppose, benchmark when the anastomosis was complete, because I presume there's no prospect of kidneys pinking up until you release the clamps?

A. Sure, obviously this implies -- he says "around" ... But at the time he administered it, it would have been because the kidney wasn't perfused as well as the team would like, which would have been evidenced by the colour of the kidney.

Q. Is it something that would be noted on his records or that --

A. Yes, if this was used.

Q. Yes.
A. Yes, of course. It's a drug being administered. It would certainly be recorded.
Q. Thank you. I'm not going to address the issue of what happened in the time when they were trying to resuscitate Adam because it's not clear that there was any nephrologist actually there at the time.

Dr O'Connor's recollection seems to be, I think on balance, that she was called and she came, and all that was happening at round about noon; she also then notified Professor Savage. It's not clear that she was physically there when Dr Taylor noted that he was unable to waken Adam, so I'm not going to address that.

But what happened thereafter is that she prescribed certain things, mannitol and so forth, and you have seen what she prescribed and her five-point plan, culminating in getting some sort of neurological opinion. And I take it you have no issue with the steps that she took at that stage?
A. None at all.
Q. Then Adam is taken or transferred to paediatric intensive care. This is the issue that I wanted to raise with you. In her evidence on 25 April -- I think it starts at page 166, line 13 -- she expresses the view that it would have been very difficult to achieve the

aim of putting Adam's sodium levels to a normal value. Can you express view as to that and, if it would have been very difficult, why it would have been very difficult?

A. I don't agree with that.

Q. You don't agree?

A. No.

Q. Why is that?

A. It's actually quite easy to manipulate the sodium concentration of a child of whom you have complete control, a child that's anaesthetised. You've got a catheter in the bladder, you know the urine output. You simply measure the output and replace it with a fluid containing a higher sodium concentration. It will inevitably raise the plasma sodium concentration.

Q. Thank you. Do I understand you to say that during the course of his time in paediatric intensive care, that's actually what you should have been trying to do?

A. That would be one of the aims, to correct the sodium, yes.

Q. I think Dr Haynes gave evidence and said, look, until brainstem death is pronounced, that child is still a patient and you carry on treating that child --

A. Of course.

Q. -- as if there is hope of recovery if I can put it that

way.

A. I agree.

Q. Does that accord with your view?

A. Yes.

Q. Then you will know that during the meeting, I think the meeting of 9 March in Newcastle, the issue of the brainstem test protocol was discussed with particular reference to his serum sodium levels. And thereafter, Dr Haynes put in a further report and he attached to it a code of practice for the diagnosis of brainstem death. The reference for it is 306-035-001. He referred the chairman particularly to page 17 of that and the reference for that is 306-035-021. There we are. That's a sort of flow chart of what you do.

He took us in particular to the third element:

"Exclusion of hypothermia, intoxication, sedative drugs, neuromuscular blocking agents."

All of which he said, at that, stage everything had been excluded. Then he got to severe electrolyte and then acid base or endocrine abnormalities as causative, but the severe electrolyte seemed to cause him some concern.

I think, if I may summarise it, it's because that was thought to be Adam's difficulty in terms of what caused his acute cerebral oedema, and yet at the time

when the brainstem death tests were being applied, the first and then the second, at that stage Adam's serum sodium level was not within normal parameters, and that caused him some concern. I should say he didn't for one moment think that at that stage Adam was not brainstem dead, he was simply talking about compliance with the protocol. And I think you also in the 9 March meeting said, in your view, it would have been preferable to have brought his serum sodium down to within normal parameters. How important do you think that is?

A. Can I answer that in two separate answers?

Q. Yes.

A. In respect to Adam, like Dr Haynes, I'm absolutely certain from all the other overwhelming evidence in the case that he was brain-dead and so actually in respect to the decisions made about Adam, I don't think that it was material. However, I do share Dr Haynes' concerns that these are extremely serious issues and these are guidelines, protocols, that need to be rigorously -- rigorously -- adhered to, and it would have been better, in my view, if his assessment was done after his sodium had been brought up to normal range. I don't think for one nanosecond that it would have altered the outcome for Adam, but I do think that in principle this is an important issue.

THE CHAIRMAN: Is that because in another case, in different circumstances, it might actually make a difference?
A. Yes.
THE CHAIRMAN: Right. Just before you continue, it's 4.30, Ms Anyadike-Danes. Are you nearly finished with the doctor?
MS ANYADIKE-DANES: Yes.
THE CHAIRMAN: Are people content to sit on for a few minutes so we can finish Dr Coulthard and let him away?
MR FORTUNE: Sir, I'm going to ask if I could have a little while to discuss matters with Professor Savage. In other words, to reflect on matters overnight just in case there is anything that arises.
THE CHAIRMAN: Okay. This evidence is particularly relevant to your client, Mr Fortune, so I'm not going to -- we would all prefer to let Dr Coulthard away tonight, but I won't force that because of the importance of his evidence to your client and I think we've already reached that position with other witnesses before to allow a bit more time.
MR FORTUNE: As Dr Coulthard must have realised, I represent Professor Savage and Professor Savage would like the opportunity to reflect on matters overnight.
THE CHAIRMAN: Okay.
MS ANYADIKE-DANES: Sir, I wonder if we could leave it this

way. I have virtually concluded, but I would have asked for a few minutes to go round my colleagues and see whether there is anything else I need to incorporate into a sort of final wrapping-up question or two. If my learned friend Mr Fortune is going to take overnight to consider, may it be better to rise now? Over the evening we can have those discussions and hopefully conclude things fairly briskly tomorrow.

THE CHAIRMAN: Doctor, an outside chance developed this afternoon that you might have been released. I'm sorry that isn't going to happen. Can I ask you to come back here and we'll resume at 10 o'clock tomorrow morning?

A. Certainly.

Timetable discussion

THE CHAIRMAN: Professor Gross will follow when Dr Coulthard finishes tomorrow. I understand that there is a real prospect of finishing his evidence tomorrow. If that does happen, it will leave us, as arrangements are at the moment, without a witness on Thursday, so we may not end up sitting on Thursday. I should say that unfortunately, very unfortunately, there now has to be an alteration to next week's list. Dr Webb, who was to give evidence on Monday, I am afraid is not available. He is unwell.

We are therefore looking at next week's timetable

and we will tell you tomorrow what progress we've been able to make on next week's timetable, which was, in a sense, a run-over week to try to tidy up and take some witnesses who we hadn't had time to reach before. My concern is it's beginning to look a bit itsy-bitsy. I want to get these witnesses heard. I'm not all that keen, as I'm sure you aren't either, to end up sitting for three or four half days, but let's see what's the best we can do with the availability of some of the witnesses.

Ms Wylie, could I say in this context, I think you now have a copy of the police statement.

MS WYLIE: Yes, sir.

THE CHAIRMAN: And the signed statement by Mr Brown.

MS WYLIE: That's correct.

THE CHAIRMAN: Given that there is going to be some availability next week and given that I think Mr Brown has generally been kind enough to make himself available, if there's any dispute of substance as to what the police have said, I would like to take Mr Brown back next week.

MS WYLIE: That's fine, Mr Chairman, subject to his holiday arrangements, but I will definitely come back to you.

THE CHAIRMAN: In any event, we're going to be here tomorrow and we're certainly going to be here on Friday, so I'd

like to know by the end of the week what the position is of Mr Brown.

MR FORTUNE: Sir, is there any possibility of boxing and coxing with the two witnesses scheduled for Friday to bring them forward to -- I'm looking at my learned friend's junior.

THE CHAIRMAN: It would suit me fantastically well personally, but I'm not sure. We'll make enquiries particularly with Dr Montague, who's coming from outside the jurisdiction.

MR FORTUNE: He's coming from Dublin, we anticipate.

THE CHAIRMAN: We will see what we can do and I can understand exactly why you're asking.

MR FORTUNE: It occurs to me because my learned friends all want Friday if they can.

THE CHAIRMAN: I understand the frustration of not sitting on Thursday and people coming back on Friday. It would be easier for quite a few people if we sat on Thursday and then resumed on Monday. We'll do what we can overnight and we will tell you tomorrow. Thank you very much.

(4.35 pm)

(The hearing adjourned until 10.00 am the following day)

I N D E X