Monday, 26 March 2012

(10.00 am)

(Delay in proceedings)

(11.31 am)

THE CHAIRMAN: Good morning, ladies and gentlemen. Welcome back to Banbridge. First of all, I apologise for the very late start. We've had an assortment of teething problems this morning, which I think we have now finally put behind us. This delay will not be repeated in future.

When we were last here on 20 February, inquiry counsel Ms Anyadike-Danes opened the inquiry and also there were comments by some other representatives. Since then, as you are aware, the expert witnesses in Adam's case have met twice. They met first on 22 February and then again on 9 March. The transcripts of their meetings have been circulated to the interested parties along with audio recordings of the meetings.

You will be aware that we gave the experts the opportunity to make further written statements if they wished. We have received -- and will distribute later on today to the interested parties -- a series of further reports from Dr Coulthard, one more from Dr Squier and one more from Dr Haynes. I understand Professor Gross and Professor Kirkham will have their

final reports with the inquiry today. You will all have them by Wednesday.

If I could remind you that the reason for delaying the oral hearings in Adam's case was that Professor Kirkham's report in February had raised a new and fundamental issue, namely whether Adam's death was actually caused by hyponatraemia at all. This was more than just an ordinary disagreement between the experts, of which there are a number. Had it been just an ordinary disagreement, we would have gone ahead without delay. But rather, Professor Kirkham advanced, effectively, an entirely new thesis about how Adam died and it was necessary to investigate that. I have read the transcripts of the Newcastle meetings and I have seen the additional reports, which, as I have indicated, you will all see later on today. As I've indicated, there are two more due in. The result of that is that tomorrow, assuming we have the further reports, I will make some preliminary observations about what has happened and what the consequences of those further reports are. But for now, and effectively for the rest of the day, Ms Anyadike-Danes will deliver her opening address in Adam's case on the clinical issues relating to Adam.

We had hoped to circulate this in advance, but due

to the stream of reports coming in from the expert witnesses and the extent of their discussions in Newcastle on 9 March, that has not been possible. I do, however, expect that the opening address will be available to you by the end of today in writing. So apart from hearing it delivered over the next few hours and following on the LiveNote system, the written opening will be available at the end of the day.

As a result of some of the discussions coming out of Newcastle and as a result of the fact that we still don't have all of the reports and also, partly, because some of the reports which we have received -- which we will share with you later -- have come through very recently, it will not be possible for Ms Anyadike-Danes to complete every aspect of her opening today, but what will happen is you will hear an extensive opening on almost all of the issues with which we are concerned on Adam's treatment.

Since this is being delivered to you without you having seen it in advance and since I anticipate that Ms Anyadike-Danes will take the rest of today to deliver it, I will allow the interested parties overnight to consider what she has said before anyone who wants to give an opening address has to do so. We have a specific indication from Mr Hunter and Mr McBrien, on

behalf of Adam's family, that they will be making an opening address. We can take that tomorrow. We are not sure whether there will be any further opening addresses and we would like to be advised of that later on today.

There are other issues which are housekeeping -- and perhaps more than housekeeping -- which we can usefully discuss before we finish tomorrow. Those issues include the progress which we are making in Claire's case, but for now I invite Ms Anyadike-Danes to start her opening address.

Opening by MS ANYADIKE-DANES

MS ANYADIKE-DANES: Thank you very much indeed.

I apologise that I have my back to almost everyone in the room. I may try and position myself over there (indicating) next time round so I'm not blocking your view. The other thing I need to apologise for is the delay. It had absolutely nothing to do with the chairman; it was to do with the first of the IT hitches. These things are my responsibility and so I apologise to everybody that you have all sat a long time waiting for me to start. I regret that and all I can do is assure you that I will do everything I can to make sure there are no delays and I'm very sorry that you've been waiting, particularly for the families and any of the other witnesses who are here.

To start with, the hearing into Adam's case is going to involve both clinical issues and hospital management and governance issues. It has been agreed that the clinical issues should be addressed first and there's going to be another hearing, which will concern the management and governance issues, and I'm going to open separately the management and governance issues. So the purpose of the opening today is to open the clinical issues and the purpose of doing that, having an opening at all, is to provide a context within which to consider the clinical evidence and to draw attention to the investigation that has been carried out and the evidence that it has produced and its relevance to the revised terms of reference and the list of issues.

There is a lot of evidence. The evidence is not only that which arises in the oral hearings, so that's part of the importance of drawing attention to it. And then, thirdly, to highlight the main issues and identify, in general terms, the areas that the legal team consider requires further testing and proving through questions at the oral hearing.

I'm conscious, Mr Chairman, that you're going to be making findings and recommendations on the basis of the totality of the evidence received and not just what is heard during the oral hearings, important, of course, as

that aspect of the investigation is. So I will try and set out for you some of what has been received from all the categories that were described during the general opening.

I'm not presuming to summarise everything as that would be, frankly, an impossible task, as well as being extremely time-consuming. Also, you will have the complete set of the evidence that has been obtained, as indeed will the interested parties. During the opening hearing on 20 February, I explained that following the establishment of the inquiry on 1 November 2004, requests for information of evidence were sent out for a number of bodies including and of relevance to Adam's case: the Department of Health, Social Services and Public Safety, the Royal Group of Hospitals, the Eastern Health and Social Services Board, the Coroner for Greater Belfast and, of course, Adam's family. And that call for documents has been ongoing since the resumption of the inquiry's work in 2008 and it is still continuing.

The search for relevant documents has and is being informed by guidance from the inquiry's advisors, from its experts and from the responses that it receives to witness statements. And for that matter, from some of the information it receives from documents, that

generates a need to request further documents, so it is an ongoing process. And if I start just with the documents and other material. To date, the inquiry has received a vast amount of material in relation to Adam's case. We have, we believe, received all his medical notes and records. We have received his developmental records. We received reports, scans, X-rays photographs, correspondence, other documents; all generated by or for the Ulster Hospital, the Royal Group of Hospitals and the Children's Hospital. And also the depositions from the inquest into Adam's death and reports commissioned by the Coroner, including perhaps, most significantly, of all those documents from the Coroner, obviously the statements and correspondence with Debra, Adam's mother. Dr Alison Armour, she was the pathologist and was required to produce a report on the autopsy after she had carried out the autopsy. Dr John Alexander was asked to provide an expert report on Adam's anaesthetic management. Dr Sumner, he was a consultant paediatric anaesthetist at Great Ormond Street and he was asked by the Coroner to provide an anaesthetic opinion from a paediatric standpoint. Mr Patrick Keane, he was, at that time, a consultant urologist and the surgeon in Adam's case. Dr Robert Taylor, he was consultant paediatric anaesthetist and

the anaesthetist in Adam's case. Dr Maurice Savage, who was a consultant paediatric nephrologist and was Adam's nephrologist. Professor Jeremy Berry, he was professor of paediatric pathology at the University of Bristol and he was asked by the Coroner to provide a pathology report concentrating on the state of Adam's kidneys.

In addition, we've had documents from Adam's family, we have had correspondence and transcripts from UTV and we have had documents from the investigations of the PSNI and they are also extensive. They are their witness statements from witnesses and they include a transcript of an interview that Dr Taylor gave under caution on 17 October. They also commissioned reports. They've had a report from Dr Edward Sumner, a report from Geoff Koffman, who is a consultant surgeon at St Thomas's in Great Ormond Street. And there is a body of correspondence and other documents that they received, some from those who were offering the PSNI assistance.

Then there are documents from other bodies and organisations. There's the Department of State Pathology, the National Patient Safety Agency, NHS Blood and Transplant, Medical and Dental Training Agency, and the NHS Greater Glasgow and Clyde. That was the hospital and area involved with the donor kidney.

Then, of course, there has been a considerable amount of correspondence from DLS as they seek to provide responses to our queries for information, and some of that correspondence provides information that one could fairly describe as evidence.

So there is a lot that has been received and all of that is part of the body of information and knowledge about Adam's case. You can see, when I put it in that way, that very important though the oral hearing is, it is a part of the investigation. The investigation itself has actually been going on for quite some time and has also generated quite an amount of information.

In addition to all of that, which is essentially documentary material, we've also received histological slides and other material in relation to Adam, and that material has been held by the state pathologist's office. We have received it so that we can provide it to our expert. It has been provided to the expert neuropathologist, Dr Wayney Squier. She has made her own slides from it and some of that material. And all of that, just so assure those, has been recovered back by the inquiry and is being securely held, but it was necessary to obtain it so they could make other own slides and form her own independent view.

So moving to publications. The inquiry has been

referred to numerous publications, not just by its advisors but its experts, the witnesses and the legal representatives of Adam's family. And we have been grateful to all who have sought to assist us by providing us with publications. We, of course, have carried out our own research and we have compiled a bibliography of all those publications and we update it as we get new -- it's not always an instantaneous update, but we do update it and that bibliography is available on the inquiry website.

But it's there to be consulted because some of that material is relied on and referred to and discussed by the experts, and it forms part of the basis of their view, so it's not simply there for the sake of referring. Some of it is actually quite significant. The majority of it concerns the condition of hyponatraemia itself and some of it includes case studies, references to the causative factors of hyponatraemia and the role of hypotonic fluids, its effects and risk of morbidity. There are other articles that concern areas as disparate as the expected brain weights in children, the effect of heparin on blood gas analysis, the calculation of the bladder capacity, right up to the development of a condition which is called posterior reversible encephalopathy syndrome, or PRES,

as I'm going to call it so I don't have to repeat it all the time.

As you'll be aware, the medical literature available on hyponatraemia has assumed even greater prominence given the debate amongst the inquiry's experts during their meeting on 22 February this year and also their meeting on 9 March. There was quite a debate amongst the experts over what the literature actually shows in relation to hyponatraemia, that condition PRES, but another also, chronic venous sinus thrombosis.

And the issue of literature was considered significantly important by the experts that it was actually on the agenda for both meetings and some of it is reflected in the reports that we have just been receiving.

I turn now to background papers. In the general opening, I referred to the commissioning of background papers by experts in their fields to provide a context for the consideration of the evidence. We are about to hear that evidence and so now is the time to be reviewing the context that they have in fact provided. Of particular relevance to the investigation into the clinical issues that are involved in Adam's case are the background papers that were provided by Dr Michael Ledwith, clinical director of paediatrics in the

Northern Trust, together with Professor Sir Alan Craft. He's the emeritus professor on child health at Newcastle University. They provided reports on the training and continuing professional development of doctors in Northern Ireland, the rest of the United Kingdom and the Republic of Ireland over the period 1975 to 2009.

There have been some queries as to why on earth are we going back to 1975. And the reason why one takes it back as far as that is one is trying to get an understanding of what the training and education might have been for the people who were involved in Adam's care, having regard to what stage they were in in their professional careers. One's trying to go back to a time when they were likely to have been at university and being trained. So that's the reason it goes as far back as 1975.

Professor Mary Hanratty, she is the former vice-president of the Nursing and Midwifery Council, and Professor Alan Glasper, professor of children and young person's nursing at the University of Southampton, they provided reports, really companion reports in a way, to that for the doctors on the training and continuing professional development of nurses in Northern Ireland and the rest of the United Kingdom, and the Republic of Ireland. Their report extends up until last year, 1975

to 2011.

Then there is Bridget Dolan, barrister at law, also an assistant deputy coroner, and her report is on systems of procedures and practices in the United Kingdom for reporting and disseminating information on the outcomes or lessons to be learned from corner's inquests on deaths in hospital, involving hospitals, trusts, area boards, Department of Health and the Chief Medical Officer.

And then, finally, I think of relevance to this particular case is the background report from Dr Jean Keeling. She's a paediatric pathologist and she has provided a paper on the system of procedures for the dissemination of information gained by post-mortem examination following unexpected deaths of children in hospital.

From the background reports and -- and they are all experts in their own right. We have the expert reports and they are experts who have been engaged by the inquiry -- again, guided by the advisors -- as the to need to address, in part, generally the role of nephrologists, anaesthetists and surgeons and the nurses involved in Adam's case. So if I go through them.

First is Dr Malcolm Coulthard. I don't say "first" in terms of "first and foremost", but simply because

I started with a nephrologist. Dr Malcolm Coulthard is an honorary consultant paediatric nephrologist at the Royal Victoria Infirmary and his reports address issues such as the roles and responsibilities of the nephrologists involved in Adam's case -- those were Dr Savage and Dr O'Connor -- and an explanation as to Adam's renal function, as well as expert analysis of the management of Adam's fluid balance and electrolytes.

Then there is Simon Haynes, a consultant in paediatric anaesthesia and intensive care at the Freeman Hospital in Newcastle. His reports concern matters such as the role and responsibilities of the anaesthetists involved in Adam's care -- those anaesthetists were Dr Taylor and Dr Montague -- and the relationship between the surgeons and the anaesthetists in the operating theatre during transplant surgery.

If I pause there. For those of you who have seen those reports, you will appreciate that it's something of a team effort to have a successful transplant surgery. And so it's an important area that we have asked Dr Simon Haynes and Mr Forsythe and Mr Rigg, who are the surgical experts -- to look at that teamwork and communication and how that should work effectively. So that's why he's been asked to look at the relationship between surgeons and anaesthetists. He's also been

asked to provide an analysis of Adam's fluid balance.

And then there's Mr John Forsythe, he's a consultant transplant surgeon at the Royal Victoria Infirmary, and honorary professor of surgery at the University of Edinburgh. And Mr Keith Rigg, he's a consultant transplant surgeon at Nottingham University Hospital. They have provided joint reports on a range of matters including the role and responsibilities of surgeons involved in Adam's case -- and they were Mr Keane and Mr Brown -- the skills required and involved in a paediatric renal transplant, including the techniques used for anastomoses -- that's basically hooking the kidney up -- as well the relationship between the surgeons and the anaesthetists during the transplant surgery. So they're the other side of that relationship. We have Dr Haynes looking at it from a paediatric anaesthetist's point of view and then looking at it from a surgeon's point of view.

Then we have Mrs Sally Ramsay, an independent children's nursing advisors and she has provided a report on the nursing aspects of Adam's care. I will refer to their views later on in this opening to try and help distill some of the issues that will be addressed during the oral hearing.

In addition, the inquiry engaged experts to provide

reports on some specific issues. The enquiry engaged Professor Peter Gross. He's a professor of medicine and nephrology in Dresden and he's provided reports on hyponatraemia and an analysis of Adam's fluid management.

Professor Fenella Kirkham is professor of paediatric neurology at the Southampton Hospital and she was asked by the inquiry to give a neurological opinion into the effect of the infusion of fluids during surgery, what effect that had on Adam's brain and the possible contribution, if any, of the venous obstruction to Adam's cerebral oedema. That's an issue I'll come to in a little while, but basically there was a concern that there had been some compromise to his venous drainage and that that had resulted perhaps because his left internal jugular vein was ligated or for some positional reason or for something of that sort. That is one of the things that she had been asked to consider.

Well, as you're aware, Mr Chairman, when she was engaged and received the papers and considered them, she had some concerns or at least she had her own views as to the exact role that dilutional hyponatraemia had played in Adam's death. She suggested the possibility that, in fact, it was a condition called acute cerebral venous thrombosis and, perhaps, PRES. They may be

alternative reasons for the cerebral oedema or, at least, the development of it that led to his death. And that issue was discussed at length by the inquiry's experts in their meetings on 22 February and also on 9 March.

I'm not going to deal in great detail with that today, for reasons I'm going to mention later on. Then there is Caren Landes, she's a consultant paediatric radiologist, and she has examined and reported on the chest X-rays taken of Adam. These are all post-surgical X-rays. One was taken at 13.20, on 27 November and the other later on in the evening at 21.30 on 27 November.

Then Dr Wayney Squier, consultant neuropathologist, also a clinical lecturer at the John Radcliffe Hospital in Oxford. She provided an expert neuropathological opinion from, as I mentioned before, the histological slides that she made from the tissue blocks of Adam's brain. She also examined a sequence of photographs of Adam's brain that had been taken at autopsy by Dr Armour and she received input from a Dr Philip Anslow on a post-surgical CT scan of Adam's brain. Dr Anslow is the other expert brought in at her request. He's a consultant neuroradiologist at Radcliffe. He considered that CT scan. He considered a CT scan that was taken of Adam's brain on 7 July 1995 and then he considered the

post-surgical CT scan that was taken at approximately 13.15 on 27 November. And he explains in his report what he sees there.

The reports of the experts received to date, barring the most recent, have all been made available to the interested parties and will be made available in due course according to the protocols and procedures that you have established, Mr Chairman.

Then we have the witness statements. So in addition to the depositions that the inquiry received from the inquest and the statements from the PSNI investigation, the legal team also requested and received a large number of witness statements and supplemental witness statements, and in some cases further yet some witnesses have had the benefit of four or five requests from a variety of persons involved to varying degrees in Adam's case. We have been guided in that task by the inquiry's advisors, the medical notes and records and other contemporaneous records and what they seem to show or don't show. Previous statements that were made, whether through depositions to the coroner, statements taken by the PSNI or witness statements to the inquiry, the statements of others, subsequent documents received from the DLS and a variety of other source of documents and, of course, the reports from the inquiry's experts.

All those have, to a certain extent, informed the questions that have been put in those requests.

The legal team has compiled a list of all those involved in the clinical case or the clinical area of Adam's case from all of the information that we have received. It explains their position then and now, briefly summarises their role in Adam's case and whether they have provided a statement, and if so, for whom. Importantly, it also indicates witnesses it is proposed to call to give evidence during the oral hearing.

I should say it's entirely possible for the evidence that's provided in a witness statement to be sufficient on any given issue and no more needs to be sought. That's particularly the case when it's not contradicted by anyone or by information from any other source, or where it's clear from an expert report that further probing of the witness would simply not be useful.

Should the evidence in a witness statement be regarded as sufficient, then, as you have indicated Mr Chairman, it will stand in lieu of oral evidence from that witness and the inquiry witness statement, PSNI statement or deposition, as the case may be, of those who are not being called will be tendered as an unchallenged account. And in due course, the legal team will compile a schedule of all those whose evidence it

proposes to tender to you in that way, and it will be a matter for you, ultimately, Mr Chairman, whether nonetheless you wish any given witness to be called.

Unfortunately, there are witnesses in respect of whom it has simply not been possible for the legal team to obtain an inquiry witness statement or who are not available to give evidence at the oral hearing. For example, the Coroner reports that on 7 December 1995, the pathologist, Dr Alison Armour showed histology slides of Adam to Dr Denis O'Hara. He was a consultant paediatric pathologist at the Royal Hospitals and this was after Dr Armour had conducted the autopsy, which she did on 29 November. The Coroner's note of 8 December records that Dr O'Hara and a Dr Bharucha -- and we're investigating exactly which Dr Bharucha is involved -- considered that there was clear evidence of hypoxia, anoxia, anaphylactic reaction. Unfortunately, Dr O'Hara is deceased and the inquiry does not have a statement of him of any type since he was not called by the Coroner, nor did he give a statement to the PSNI.

As I indicated during the general opening, all we have of Dr O'Hara's views is what was recorded by the Coroner in his note of 8 December 1995. If we are able to locate Dr Bharucha, that will be helpful, that will be an insight, but otherwise that is all that we will

have on that matter.

A further example is provided by Dr Fiona Gibson. She was consultant anaesthetist at the Royal Hospitals. She was asked by Dr George Murnaghan, who is director of medical administration, to visit the theatres in the Children's Hospital with Messrs Wilson and McLaughlin. She provided -- or at least she did visit with them. She provided a short report that's dated 4 December 1995, in which she concluded:

"The protocols for monitoring anaesthetic set up and drug administration in this area are among the best on the Royal Hospital site and I can see no reason to link these very sad cases into any pattern."

The inquiry requested a witness statement from her in 2005 and it's quite possible that she would have been called to give evidence at the oral hearing. Furthermore, the inquiry has subsequently received correspondence from the DLS that seems to contradict Dr Gibson's reference to protocols and it explains that what she might have meant was "practices". The legal team would have wished to pursue that issue with her, both in relation to this clinical part of Adam's case and that part which is going to be concerned with governance, but unfortunately for us and for her, Dr Gibson is not available for medical reasons. And so

the only information the inquiry has on her views are those contained in her statement to the PSNI and her very short report. It will be a matter for you, Mr Chairman, to determine what weight you will afford the information that we have, where the legal team is unable to pursue its enquiries.

Let me now turn to documents that are compiled by about the inquiry. It has been absolutely vital for the legal team to develop ways of distilling the vast amount of information that has been accumulated by the inquiry into the investigation into Adam's case. Accordingly, the legal team has compiled a number of schedules and charts to try and provide that information to you, Mr Chairman -- and for the benefit of everyone else -- in a more accessible way in relation to the issues. And I will refer to those documents throughout the opening and will explain their use and significance.

A list of all those compiled documents will be provided to you in due course, and since the investigations are continuing, it is possible that further such documents will be provided, and they are really only provided to try and find a way of summarising or crystallising or getting to the essence or being able to compare different aspects of information that we're receiving. That's their function

and since we are still receiving information, including expert reports, it is quite possible that we will produce yet further documents of that type.

Mr Chairman, I want to move on to saying something about Adam and his family. Adam was born at 10.58 on 4 August 1991 at the Ulster Hospital in Dundonald by Caesarean section. We can see that hospital on the map, if I call that reference up of 300-001-001. There it is. You can see the Ulster Hospital there, it was there in the Eastern Health and Social Services Board there.

Then if you see also the Royal. They're all clustered together. That's, of course, the hospital where Adam was transferred. Then you can see the Belfast City Hospital, while we have this map here. That is the hospital from whom the surgeons come in relation to paediatric renal transplant. But I'll say more about that in a minute.

So with Adam, antenatally, cysts had been noticed in Adam's abdomen and it was not clear at the time what they were, but an ultrasound scan performed after his birth showed that he had dysplastic kidneys with bilateral large cysts. Adam's clinical history and its possible relevance to what happened to him during his transplant surgery on 27 November 1995 will be set out

in greater detail later on, but in summary, he developed problems with the drainage of his kidneys related to obstruction and vesicoureteric reflux and he was transferred from the Children's Hospital to the Ulster Hospital when he was just a few months old.

When he was there in the Children's Hospital, he came under the care of Dr Maurice Savage and also Mr Stephen Brown. Thereafter, Adam had multiple operations to his urinary tract for which he was largely under the care of Mr Brown. He had re-implantation of his ureters on two occasions, he had nephrostomies which performed during the early months of his life and, on several occasions, he was critically ill and required care in the paediatric intensive care unit. He had a brief period of dialysis due to acute renal failure. In addition, he had a fundoplication procedure that was carried out in 1992 -- when he was less than a year old -- to help prevent gastro-oesophageal reflux and, eventually, he required all his nutrition through a gastrostomy tube. In 1993, he had a cystoscopy and a PEG gastrostomy.

Adam was subject to recurrent urinary tract infections and his renal function deteriorated to the point when, in August 1994, he required dialysis. And his mother was trained in the home peritoneal dialysis

technique so he could be dialysed at home and, according to Dr Savage, Adam's urine output was quite large, but of poor quality and he described him as being polyuric. Also, according to Dr Savage, Adam had a potential for hyponatraemia and he received sodium supplements in his feeds. His recorded sodium levels for 1995, the year of his transplant surgery, showed one very low result of 124 and a number below the normal range of 135 to 145 millimoles.

Adam was put on call for a kidney transplant once he was placed on dialysis. His tube feeds in the month prior to the transplantation surgery were slightly over 2 litres per day and he passed in excess of about 1 litre of urine each day. All those details are obviously important and will be gone into in much greater detail by the witnesses and the experts, but I simply put them now so that you have the context of his condition and its effects.

But I should say that Adam, of course, was so much more than a child with chronic kidney problems and his mother has written a moving tribute to him in a booklet provided by his family. It's called "Adam and the Hyponatraemia Public Inquiry". I will just read a little bit from it so that we do recall the little boy that this investigation is actually about in terms of

his clinical case:

"When I had to go back to work part-time, his nanny and grandad looked after him. He adored them and they him. They would take him for walks along the beach and he would copy the way his granda walked with his hands behind his back. He enjoyed shopping with them in Holywood where he had his favourite shops and everyone knew him. His manners were impeccable -- this was commented on by so many people and I was proud to take him anywhere.

"We were a very close family anyway, but Adam brought us all closer. His aunties and uncles loved him dearly and were always there for him. He never lacked attention. No matter what life threw at him, he faced it with a smile. He was such a happy little boy who endured more in his four short years than most people go through in a lifetime."

I turn now to the hospital and the clinical and nursing personnel. In 1995 and today, the regional paediatric nephrology service for the province of Northern Ireland was provided by the Children's Hospital and, at that time, the Children's Hospital was part of the Royal Group of Hospitals Health and Social Services Trust, which was part of the Eastern Health and Social Services Board. And Mr Chairman, I have said something

of that in the general opening, so I don't propose to go into that organisational structure again. But today, the Children's Hospital is part of Belfast Trust, which is part of the Health & Social Care Board.

However, renal transplants were originally provided solely from the renal unit of the Belfast City Hospital, established in 1959. In fact, the first renal transplant to take place in Belfast occurred there in 1962. Paediatric renal transplants began in Northern Ireland in 1980 when Dr Savage was appointed as paediatric nephrologist and, initially, all paediatric transplants were carried out at the Belfast City Hospital, but from 1990 they began to take place at the Children's Hospital. Nevertheless, all the surgery seems to have been performed by renal transplant surgeons based at Belfast City Hospital and, generally, those surgeons would be adult surgeons. For example, Mr Keane, who carried out Adam's transplant surgery, was an adult consultant neurologist. On occasion, a paediatric surgeon would be present and, actually, that is what happened in Adam's case with Mr Stephen Brown.

The location of the two hospitals can be seen on the map that I've just brought up and we've already seen that. You can see the distance between them. That's

relevant if you're bringing clinicians over from one hospital to do work in another.

From 1982, Dr Savage, who was Adam's nephrologist, acted as a consultant paediatric nephrologist for regional transplants taking place in Belfast. The second paediatric nephrologist, Dr Mary O'Connor, who was also involved in Adam's case took up a post at the Children's Hospital on 1 November 1995 and, since 1995, the majority of renal transplants on children under 14 years have been performed at the Children's Hospital rather than at the Belfast City Hospital. By 1998, 77 renal transplants had been carried out in Belfast hospitals on patients younger than 18 years old, and Adam was the 69th. Of those 77, only two have died, and unfortunately, Adam was one of them.

The organisation of the Children's Hospital in 1995 can be seen in the organisational chart that the legal team has compiled. If we could pull up reference 303-043-510. There it is. That's the structure as it was at the time that Adam was admitted to hospital for his surgery. So you can see, right at the top, there's the chairman and you can see it's George Quigley until 31 December 1995. So literally as Adam was admitted, he was the chairman. Then from 1 January 1996, Mr Paul McWilliams. Below that, you see the chief executive,

Mr William McKee. And then, branching off on the left-hand side, you have the non-executive directors. I'm not going to say very much about them. On the right-hand side, you have the executive directors. And then there is a group in the middle that seem to be directly connected with the chief executive in ways that we will explore, doubtless, in the governance part of the hearing.

But if you look at that middle group, we see: corporate affairs, facilities, personnel, planning, development and pharmacy. And then, in the middle of that group of three on the right-hand side, you see "medical administration". Dr George Murnaghan: his name was one that I have mentioned already in this opening and those of you who have read the papers will be familiar with his name and his correspondence and communications with the Coroner and so forth, largely in relation to the inquest.

Then moving to the executive directors, there's the director of finance, director of nursing and patient services, and then the medical director, Dr Ian Carson. Let's stay with the medical group for the moment. Cascading down, "obs and gynae and neonatal". That's Professor Toner. But just immediately below him, paediatric. Dr Conor Mulholland, he was acting at that

time. And then "laboratories"; there will be evidence and information about laboratories. That was Professor Peter Toner. Medical was Professor Gary Love. We can pass over the other two and come down to radiology on which there are some issues. That is Dr James Laird. If you go to the top of the second group, anaesthetics, theatre and intensive care. Dr Gaston: his name appears in an number of places in relation to Adam's case, most particularly arising out of or surrounding the time of the inquest. And then if we go further down we see that Peter Walby is ENT and then, surgical, Mr John Hood. So that's the structure as it was.

If we can pull up the full screen again. The director of nursing was also the director of nursing and patient services, so she, Miss Elizabeth Duffin, acted at two levels, if I can put it that way, and there are nursing issues in Adam's case and, doubtless, we will be looking at that when we approach the governance part of this hearing.

So in addition to the lists of persons compiled for Adam's case, there are two companion documents which I think I mentioned before. One is the nomenclature for grading for doctors, 1948 to 2012, and the other is the nomenclature and grading for nurses, 1989 to 2012. Really, they've been provided to assist with the

terminology in use so that when a given grade is given for a clinician, it is hoped that you will be able to readily see what that means.

And unless it's of particular relevance to the issues, I'm actually not going to go into what any given grade means. But I leave you with those two documents if you wish to consult them yourselves to better understand.

Of particular note of those who are present during Adam's transplant surgery. I've referred already to Dr Savage and Dr O'Connor, and they were both involved in Adam's transplant surgery as consultant nephrologists, although I should say neither of them were there for the full duration of his surgery. There's Mr Keane and Mr Brown, they were involved as surgeons and in addition there's Dr Robert Taylor. He was the consultant paediatric anaesthetist during the surgery and he had previous experience of anaesthetising Adam. He was assisted by Dr Terence Montague at the beginning, but not for the whole of Adam's transplant surgery.

There are also several nurses present: staff nurse Patricia Conway who prepared the theatre and the instruments, but she appears to have left at 8 in the morning. And then there is staff nurse Mathewson. She

was the runner in the operating theatre and staff nurse Popplestone and she acted as scrub nurse during the transplant surgery. It seems that Peter Shaw was also present and he was there as a medical technical officer.

Then just finally of those involved, there is the State Pathologist's Department. Adam's autopsy was performed by Dr Armour who was, at that time, a senior registrar pathologist at the State Pathologist's Department. That department was headed by Dr Jack Crane as State Pathologist, now Professor Jack Crane. He has remained the State Pathologist throughout the period from Adam's death until the present day and amongst the State Pathologist's responsibilities is the provision of an autopsy service to the coroners and, in 1995, the state pathologist was responsible to the Secretary of State for Northern Ireland. Currently, following devolution, the State Pathologist is responsible to the Minister of Justice.

In addition to the State Pathologist who acts as a consultant pathologist, along with all his other duties, there was a deputy and two assistant state pathologists and they were all of consultant grade and they assisted in the conduct of coroner's post-mortem examinations, and those pathologists, we understand -- although it will be a matter to be explored -- take responsibility

for the autopsies they perform, but the State pathologist has overall responsibility for ensuring that all cases are carried out to the appropriate standard.

And in 1995, the department employed -- that's the Department of State Pathologists -- employed two trainees at senior registrar grade who worked under the supervision of consultant pathologists.

Dr Alison Armour, we understand, was one of those trainees and the legal team is pursuing its investigations with the State Pathologist's Department to make sure we understand the structure of it and who was responsible for whom and in what way.

If I move on now to the context of the education and training that I have been mentioning that the doctors and nurses had -- and other clinicians. The condition of hyponatraemia, I think I described before in the general opening as: this is when the blood level of sodium is lower than normal either because of an excess excretion of sodium over intake and subsequent water intake and retention, which is hypervolemic hyponatraemia, or by an excess of water intake over output, diluting the serum sodium. That type of hyponatraemia is referred to as dilutional hyponatraemia. There is a distinction, of course, between the two of them. The type that it has been

thought that Adam developed was the dilutional hyponatraemia, and the medical literature contains a number of articles published prior to Adam's transplant surgery, pointing to a possible connection between hyponatraemia in adults and certain effects in the brain, including death, and some of those date back to the late 1970s and 1980s, and they are included in the bibliography. So if you want to know, so far as we have been able to ascertain it, what the literature was saying about hyponatraemia as early as the 70s and 80s -- and we hope that we have reflected some of that in the bibliography.

In 1992, Arieff, Ayus and Fraser published an article in the British Medical Journal entitled "Hyponatraemia and death or permanent brain damage in healthy children". That dealt with the results of their study into a group of children. The object of the study was to determine whether hyponatraemia causes permanent brain damage in healthy children. All of the 16 children, both male and female, in the clinical case study were hospitalised with seemingly minor illnesses or who had minor surgery, and they all subsequently suffered respiratory arrest with symptomatic hyponatraemia, and the children either died or suffered permanent brain damage. All of them were found to have

cerebral oedema following CT or MRI scans and nine of the ten who underwent post-mortem were found to have cerebral oedema with herniation. That is the process where the brain literally drives down brainstem and leads to -- sometime it is called "coning" -- and leads to death. You will have seen that in some of the literature and reports.

The brain weights of the patients were found to be, on average, more than 10 per cent higher than the normal values for children of the age range studied and the conclusion drawn from that study and reported in the published paper was that generally healthy children with symptomatic hyponatraemia could abruptly develop respiratory arrest or die or develop permanent brain damage and the authors recommended that hypotonic fluids -- that is fluids with sodium concentrations with less than the concentration found normally in the blood -- should not be used with hospitalised children unless there was a clear need to do so.

That article is mentioned repeatedly in the papers of all the cases that are the subject of this inquiry -- sometimes it's referred to simply as "the Arieff article" -- and it has been cited in numerous publications, including an article by Dr Armour on Adam's case. Her article is called "Dilutional

hyponatraemia: a cause of massive fatal intra-operative cerebral oedema in a child undergoing renal transplantation". And that was published in the Journal of Clinical Pathology in 1998. An issue being investigated by the inquiry is the extent to which the clinicians and nurses involved in Adam's case were aware of the dangers of hyponatraemia in paediatric cases -- at the time, of course, they were involved in Adam's case -- and therefore the need for appropriate fluid management. And in addition, the inquiry is investigating whether clinicians and nurses were receiving appropriate education and training in these areas at that time.

The legal team has compiled schedules in relation to the specific clinicians and nurses who were involved in Adam's case. Let me call it up. If we start, please, with reference 306-005-028. There we are. That is education and training of the doctors in Adam's case in fluid management, in particular hyponatraemia and record keeping.

It's a very simple depiction of what we have gleaned from their witness statement requests because they were all asked these questions. So on the far left is a witness statement reference number, then the name of the person involved, their undergraduate study and

we can see -- as it happens since they're all done alphabetically -- there is Bhat and she tells you what university she did her university training in, then any postgraduate study, then a hospital induction, and you see from that that she actually had an introduction to hospital policies and protocols, so that was part of an induction the first two days of starting training at the Royal. She doesn't recall anything specific about training in fluid management.

Then there's a CPD column and she's said what she had by way of CPD. She goes on to say that she had fluid and electrolyte management for paediatric patients taught as part of the curriculum of those courses that she attended. And then she gives her experience. That has been compiled for all of those who were directly involved in Adam's case, and it'll be available for you and you can consult it.

It's not supposed to replace what they said in their witness statements, but it's supposed to assist as an easily-referenced guide as to the kind of education and training they themselves say they had. There is one for the nurses, we can call that up. 306-001-001. Education and training of the nurses in Adam's case, and the same thing, fluid management, and in particular, hyponatraemia and record keeping. And it works in

exactly the same way with a reference number, name, and, except for nurses, because their professional structure is slightly different, so we have a pre-registration column. Let's look at Susan Beattie, she's first up. She talks about being a student nurse from October 1989 to January 1994. She says what her basic training was with regard to fluid management and NMC guidelines on record keeping. She doesn't recall any particular training or education post-registration. She says nothing about hospital -- in fact, she says she didn't have any hospital induction. For CPD, she doesn't recall any undertaking at that time, but -- that time being at the time of Adam's admission to surgery -- but since then she cites a number of courses she has been involved in. Interestingly, if you go straight down to the bottom of that little list, you will see the BMJ e-learning module, "Hyponatraemia", March 2011. She's attended that, she did in March 2011.

Then her experience in these matters. She doesn't recall having any in particular. And that has been, just as in the same way for doctors -- let's have a look at some of the --

THE CHAIRMAN: Just pause there for one moment. The guidelines which were issued after Raychel's death, her death was in 2001 and the guidelines were issued in

2002.

MS ANYADIKE-DANES: March 2002, yes.

THE CHAIRMAN: Do any of these nurses say they were trained in the guidelines?

MS ANYADIKE-DANES: Unless they say they are, they're not reflected in this.

THE CHAIRMAN: Okay, thank you.

MS ANYADIKE-DANES: It may be that not all of the nurses that are relevant for Adam's case were in nursing at the time when those guidelines came out. But whoever was in nursing, the question that was posed should have elicited that information if they received that training and guidelines.

THE CHAIRMAN: Miss Beattie's training covers her up to 2011. Mrs Dowdie covers her to 2010.

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: But then Miss Conway says fluid management is not relevant to her -- so it may change from one to another.

MS ANYADIKE-DANES: It may change, but the purpose of having it is so precisely you can do that thing. Some may have completed their witness statement requests in more detail or greater case, but nonetheless that's what they've done and when they're called to give evidence, they can be asked those questions and, for that matter,

from the point of view of governance, it becomes relevant -- I think this may be where you're going -- as to what was actually being done so that anybody was able to appreciate they were being taught about those guidelines, but yes.

Just while we're there, it's worth looking at some of the nurses that are involved. Patricia Conway we have mentioned. Perhaps if you keep it to the main thing there ... She says that during both adult and paediatric nurse training she received training on how to record fluid management on fluid balance sheets and how to administer fluids according to the prescription by medical staff. She received continuous updates on the importance of record keeping. So that is what she claims for herself.

In terms of the hospital induction, she said she was told about where fluids were stored and to check and correct and the volume to be delivered and the rate of delivery. And then, under her CPD, she says that fluid management wasn't relevant to her current practice and we have already noted that she continued to receive updates on the importance of record keeping.

I don't know if we can pull up any more of that document. Are we able to pull up the next page?

THE CHAIRMAN: Do we need to?

MS ANYADIKE-DANES: Probably not. I was simply going to go through some of the nurses who are directly involved.

THE CHAIRMAN: We can look at them another time when they come to give evidence. I diverted you and I am anxious to keep moving.

MS ANYADIKE-DANES: I didn't pick up some of the detail in relation to the doctors who were involved in Adam's case, but it's a similar thing: one can look and see, for any given doctor, what they have claimed for themselves in terms of their education. One thing I should say that isn't, I believe, reflected on the table for the doctors is that Dr Robert Taylor has accepted that he knew about the Arieff article. One finds that in his deposition to the coroner. So from his point of view, there is no issue that there was something going on in that article that he didn't know about or appreciate. He's accepted that he knew it.

I should say that we have not carried out an investigation to verify the accuracy of any of that information. We have simply recorded in those schedules what we have received by way of information. I'm not sure that it would be a straightforward matter to try and verify it. Therefore, as it stands, and if it were to be untested in oral evidence, it would be a matter entirely for you, Mr Chairman, what weight you placed on

it.

If we could go now to Adam's diagnosis and clinical history. I gave a little summary of that earlier and now we move into more detail. I have described Adam as having dysplastic kidneys with bilateral large cysts and it seems that Adam's condition developed with it a risk of him developing chronic renal failure. The legal team has prepared a number of visual aids to try and explain further Adam's condition. Can we go to 300-027-045? No. We can't. If we were going there, that would have given you an outline of the organs making up the standard human anatomy. But that's simply to give you a context within which to appreciate his condition. You will get all these documents since they are referred to, they're part of the opening. There's also a diagram which shows the kidneys in amongst the other organs so you can see, when the transplant operation is in place, what else is there in that vicinity.

If we move then, just to deal directly with the kidneys. They, of course, form a vital part of the body's renal system and -- not wishing to inform those who already know this very well, but nonetheless to be clear -- they have many functions. Their primary role is to filter out waste products from the blood and to excrete those waste products in the production of urine.

There are many medical terms that we are either about to embark on now or will be evident from the reports of the experts. Some of them are highly specialist, particularly those that are in the reports, the more recent reports of the inquiry's experts, and the legal team has prepared a glossary of medical terms with the benefit of guidance from the inquiry's advisors. It is updated as we receive further documents and we try to keep it current, but it's not always possible to respond immediately to something.

It is there as a ready reckoner, really, to allow people to understand what these terms mean and to avoid me -- who's obviously not medically trained -- from having to embark on the tricky subject of explaining what some of them are. Some of the terms are very important that you understand and actually are critical to appreciate the way that the inquiry's experts have been considering matters. When that happens, usually the inquiry experts explain it themselves in their reports and, if they haven't explained them adequately so people can understand, I will certainly ask them to expand on that when they give their evidence, because it is important that people understand the basic mechanisms that they are talking about and why they say things do or do not have or can or cannot have

a particular effect.

But anyway, for present purposes, I'm trespassing into a area I said I wasn't going to. Adam's condition basically meant his kidneys were abnormally formed before birth, and that caused them to be small and function poorly and improperly. Can we call up -- this is going to be a picture of a kidney if you're squeamish.

THE CHAIRMAN: These are not Adam's kidneys?

MS ANYADIKE-DANES: No, they are not. There are going to be no pictures shown of Adam in this opening and the only pictures that we have directly of Adam, anatomically, are scans of his brain. Some of those will have to be shown, but I have spoken to his family about it. There is one photograph I would like to show of Adam, but subject to that, all these are just for the purposes of people understanding what we are talking about.

So if we call that up, which is 300-085-183. There it is. That's a human kidney, a normal one, so we're told. And if we call up the next one, 300-030-048. That is a kidney that has the kind of condition that Adam had. Obviously, that is not Adam's kidney, nor can I say that is exactly how Adam's kidney would have looked, but that is a kidney with that kind of condition, and those irregular protrusions are the

cysts.

As a result of his condition, Adam suffered with renal problems with birth. And, as you've heard, he was admitted to Musgrave Ward on 15 October 1991 under the care of Dr Savage; he remained his nephrologist throughout his life. The legal team has compiled a timeline of main events of Adam, 1991 to 1995. Can I call that up. 307-001-002.

There is a lot going on in this timeline. When you receive it, I would urge you to look at it and consider it. Everything on there is referenced, but if I call up the next one -- sorry, let me tell you the top headings. There's the timeline going down the far left, and then the first block is the hospital admissions, procedures and notes. Those are all taken from his records, and you can see the reference to them. It's really indicating every time he was admitted, and I will say a little more on that in a minute, but I just want to lay out the scheme of it.

If we go to the next block, we have fluids, and they are divided into input and output. Serum sodium. Now, when one gets to the serum sodium, there's a range, 135 to 145 millimoles, and that's considered to be the normal range. You will see in there highlights.

Now, back to urine sodium. We have highlighted the

results of 25 or greater. Then if you go to the serum sodium, we highlight the results of 25 or less or over 155 -- these are really outside the range by some degree -- or a fall of 10 or more millimoles over 24 hours. And then the next one is a serum sodium, and there's the range there: 3.5 to 5, and we've highlighted the low results there of 2.5. Then haemoglobin, there's the range, 11 to 15, and we have highlighted particularly low range. We do indicate everything out of range, but the red, if you like, are particularly out of range, if I can put it that way.

The next block is medication, and there are particular elements of his medication that we have highlighted. Then the final block is dialysis, prescription and cycles. That changed over time and may or may not be relevant to what happened.

I want to show you another document before I discuss slightly more detail. The other document is the summary document. 307-001-001. If we can pull that up just for now. This document is to try and make things a little easier. That's an Excel spreadsheet with all the dates down the left-hand side and what that has done is show all the reds that were on the timeline, and show them in relation to the colour that has been ascribed to them in the timeline, or at least tried to so far as the

colours match up.

So any time there is a red point -- and we'll go through the timeline and you'll see it -- that is reflected in a block of colour. The purpose of doing that -- because the timeline itself, when you see it, is actually quite extensive. If you can imagine, it goes from his birth in 1991 to his death in 1995. The purpose of doing this is to try and get an appreciation of when Adam had a period when he didn't have any of these red events, if I can put it that way, because as we go into another document that we've prepared, his schedule of surgical procedures, that poor boy was in and out of hospital a considerable amount of time.

But if you look at this, you can gain an idea of when in relation to that period 1991 to 1995 there appeared to be none of those red line events. If you go right down to just around the time of his surgery, November 1995, look in October, there's a green and there's a purple. The green is medication, which is actually erythropoietin, and he was given erythropoietin to do with his anemia. The purple is dialysis. So even though there are two references there, they're not necessarily anything that is adverse, it's indicating maybe a change to his medication or change to his dialysis cycle.

And if you look before that, between July and October, there's none at all. So simply on that, he would appear -- and, of course, it's a matter for evidence and a matter for you, Mr Chairman, to find, but he would appear to have entered a period of being relatively free of some of the matters that have proved problematic beforehand. As I say, it's a matter of evidence. This is simply a collation of information.

If we go back to the timeline at 307-001-002. There we are. If we stay with hospital admissions, procedures and notes. We have not included everything in there, but the sort of thing that we have included, and are highlighted in red, are operations involving central lines and the use of catheters. That's not highlighted up in the main block in red in the way the others are, but that's the sort of thing that's put in red under that block.

Along with this timeline, there are associated documents that have been compiled. They really are there to help me having to go through in detail from his medical notes each and every aspect of his admission before his transplant surgery, and the point is that there are some key areas which the experts' details rely on, and it's important for us to be able to show the timeline of his care, his clinical history, so you

yourself can see how these arise and how they may be relevant to his transplant surgery.

Now, if we stay with that first column, we have also compiled a separate schedule of all Adam's surgical procedures. We can pull that up. That is 300-060-107. Is it possible to expand that a little bit? Okay. This is a summary. Down the left-hand side, you see the date, then you see the procedure, then you see the surgeon or surgeons -- sometimes there were more than one involved -- and the anaesthetist -- again sometimes more than one -- and the reference and where that comes from. We have tried to include all the consent forms, the operation note and the anaesthetic record as the basic information for what was happening. That is done all the way through up to and including his transplant surgery.

THE CHAIRMAN: These are documents, Ms Anyadike-Danes, which can be made available to all the interested parties?

MS ANYADIKE-DANES: Absolutely, and they will be.

THE CHAIRMAN: But they haven't yet been?

MS ANYADIKE-DANES: No, they haven't.

There is an associated spreadsheet, and that is reference 300-060-109 if we can go to that. That's the first page of it that gives you the key so you can see that it shows you which of those periods in hospital

constituted a day admission. It then shows you the admission date and the discharge date, and the difference between those is the period in hospital, which is in pink. The reason for doing that is because it makes quite clear, when you see it, just how much time Adam actually spent in hospital. This is time when he's being measured, assessed and recorded, and it's all medical information that's in his notes and records and is available to any clinician afterwards treating him, or should be.

I'm just trying to see if we can go to the next page of that. No. Well, when you see it, you'll be able to see in an Excel spreadsheet form, so far as we've been able to glean from his medical notes and records and every other source we have, all his admissions, all his periods in hospital and what they were for.

Can we go back to that timeline, the coloured-up timeline. 307-001-002. Thank you. The next column, fluids. Input and output. This is detailing all the records of the fluids that Adam received during his hospital admissions and all the fluids that he lost, particularly as a result of diarrhoea or vomiting, and they are derived from a separate schedule. If I call up 300-059-090.

There you see it. There was a timeline. The way

the system works is at the moment it's only pulling up the first page, but since you're going to get the document itself, it's enough for illustrative purposes. This is recording from as early as we have been able to do so, compiled from his medical notes and records, his fluids -- there's his fluid intake. If we take the example of 28 November 1991. The total fluid intake and the reference for it. Then if you go across to urine output, there you see the record of that.

Now, we say nothing about how accurate these things are, we are simply compiling them from his medical notes and records, and on it goes. And in the fluid intake, we try and distinguish if the notes do in what form that intake -- whether it's intravenous, whether he had any orally, as he did in very early periods, and we have also in the footnotes listed comments that might assist in understanding or interpreting or at least queries about the information we have found.

THE CHAIRMAN: Okay, thank you.

MS ANYADIKE-DANES: So that's that. Then if we go back to 307-001-002. The next two columns detail any measurements of Adam's urine and serum sodium levels. And, as I explained to you, we've taken the normal range of 135 to 145 millimoles and of note are the occasions when his serum sodium fell below 125 millimoles, which

has been defined in some places as constituting severe hyponatraemia, and when the serum sodium was higher than 155 millimoles, which has been described in some places as constituting severe hypernatraemia. And when his serum sodium fell by 10 or more millimoles in a period of 24 hours, it has been treated as an acute fall, and all those instances are recorded in red. In fact, you can see there are some there.

THE CHAIRMAN: Yes, okay. Thank you very much.

MS ANYADIKE-DANES: They derive from a comprehensive schedule that records all Adam's serum sodium and urine sodium levels with a graphical representation of that. I think if we pull up 300-059-079. Yes. This is what I want to show you. These are, in a graph, all plotted, all the records of Adam's serum sodium levels between August 1991 -- which was the first record we could find -- to November 1995.

There's an intensive period of monitoring that happens between August 1991 and April 1992. In fact, that averaged about 15 times a month, and then there was periodic monitoring thereafter. So the spacings at the bottom are unequal time periods because you couldn't show that with the volume of records. But the things to note: the parallel red lines, they are the normal range, if I can call it that, 135 to 145, so it's quite easy to

see the periods of time when he suffered hyponatraemia and, for that matter, hypernatraemia. And you can see that, in the early months of his life, he had some very low values indeed. There's a value there that looks about 111.

Then if we go to the other side, which is his admission on the day of his surgery, you will see there are the low values there. At the top in those little magenta blobs, they're to try and indicate roughly when he was in hospital for some of those periods and just to get a sense of what correlates with what. But, in fact, we know more accurately from the timeline exactly when he was in hospital and from the surgical schedules that I just showed you.

But that particular graph is in some of the expert reports and it may be worth considering at other times when the experts and the clinicians are giving their evidence to try and understand what was happening when those very low values were being recorded and why they were happening and how they were dealt with and what the implications of them are or were for the planning for Adam's transplant surgery.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: Thank you. Can we go back to 307-001-002? The next two columns show any measurements

of Adam's serum potassium levels and haemoglobin levels, and the values outside the normal range are highlighted -- well, the ones literally outside the normal range are highlighted in their corresponding colour. You have one there, 5.1 on 16 October 1991. That's outside, it's slightly higher. So it's outside the normal range and so it bears a colour. If you want to find out where that comes from and the context of it, there is a reference for the source for that information.

The acute ones, as I said, are highlighted in red. And then the final two columns, that's the medication and the dialysis columns, they, if we stay with the green column, "medication", that's to show some of the medication that Adam received and the detail, and that medication that is considered to be relevant. We have confined it to sodium and iron supplements and erythropoietin and the medication he received between his admission for his renal transplant surgery on 26 November and his death. The reason that we have confined it to that is really, it seems, leaving aside the third one, that the sodium and iron supplements and the erythropoietin, these are some of the issues that the experts have been debating as being potentially significant.

Then the dialysis is really to record the changes in his cycles: when had he first started, when those cycles were altered and what the prescription for it was. The relevance of that really is to see, whatever happened on 26 November -- because he was dialysed that night -- how that compared with his normal dialysis cycles and what, if anything, might be the significance of that for planning for his fluid management.

The state of Adam's health -- and I won't take you back to the summary because I've shown you the summary and I've commented on the implications of having apparently colour-free periods just before his surgery. And part of the relevance of that, of course, is that Dr Armour, when she gave her evidence to the Coroner on 18 June, described him as:

"Adam was not a healthy child; he was a sick little boy."

That may well have been evidence given in context, but in the context of Adam's clinical history, you will see what the experts say about his condition and, indeed what Dr Savage said about his condition. Arguably, from his point of view, he may have been actually in very good medical condition when he arrived for his surgery, but that is going to be an issue and you will hear evidence about it and, Mr Chairman, you will determine

that. They are live issues to be heard in the oral hearing, as is the significance of any of these matters in relation to his condition for the cerebral oedema that developed.

Another issue -- and I mentioned it just a little while ago -- I'm just going to take you to this point and then, Mr Chairman, I don't know what you want to do about a break. But another issue that has taken on a degree of significance is whether his left internal jugular vein was ligated. That arises because Dr Armour's autopsy identified, under the section on "internal examination of neck", a suture in situ on the left side of the neck at the junction of the internal jugular vein and subclavian vein. The relevance of that suture was described by her under the commentary section of the report on autopsy -- and this is what she says:

"Another factor to be considered in this case is cerebral perfusion. The autopsy revealed ligation of the left internal jugular vein. The catheter tip of the CVP was situated on the right side. This would mean that cerebral perfusion would be less than that that in a normal child. This would exacerbate the effects of the cerebral oedema and would also be considered as a factor in the cause of death. Therefore, the most likely explanation is that the cerebral oedema followed

a period of hyponatraemia and was compounded by impaired cerebral perfusion."

And she reiterated that view in her evidence before the Coroner on 18 June and she said:

"There was impaired cerebral perfusion as there was a suture on the left side and a catheter tip on the right. The suture impaired the blood flow to the brain and the catheter tip on the right may have had a role to play. The suture had been there for some time."

And that might turn out to be a significant observation. The structures being discussed by Dr Armour can be seen in a diagram, so you know where we are. It's 300-087-185. I wonder if that can be enlarged just a little bit. Thank you. This is a diagram which is in the expert reports of Professor John Forsythe and Keith Rigg, the surgeons. But there you see it, you see the left internal jugular vein and the left subclavian vein, and what she says is that there was a suture just at that point (indicating) -- at the junction, in fact, I think is the way she described it. At the junction of the internal jugular vein and subclavian vein, that's where she says she identified a suture.

THE CHAIRMAN: And she suggested that may have been an obstruction to something?

MS ANYADIKE-DANES: She does. She also says there was a catheter tip on the right side. So essentially, what she was saying is that that system was compromised. On the right side you had the catheter tip, which had gone up in the wrong direction, as Dr Taylor says was shown on the X-ray, and was to have been measuring the CVP. And have that on the right-hand side, and then on the left, in this particular position that she says she saw it, you have the suture, which she describes as "ligating".

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: The inquiry has carried out investigations to identify the particular surgical procedure that led to the ligation of Adam's left internal jugular vein. And what the inquiry received back from DLS was that there is no evidence that the internal jugular vein was ligated in the Children's Hospital. The commentary section of the post-mortem report is the only place where it is stated that the internal jugular vein is ligated. Ligation is not mentioned in the section on internal examination of the neck. In the 1980s and early 1990s it would have been considered standard practice in the children's hospital to ligate the internal jugular vein during insertion of a Broviac or Hickman central venous catheter. In the

early 1990s, a new technique was introduced whereby the common facial vein was used in order to preserve the patency of the internal jugular vein. The typed theatre note of 29 May 1992 clearly states that.

"The common facial vein was used, thereby, by definition, preserving the left internal jugular vein."

In fact there you can see it: common facial vein. It's a higher position, of course:

"The removal of the Broviac line is a relatively simple procedure, which would not have required exploration of the neck. The Broviac line is simply removed by traction at the exit site -- in this case, the left anterior chest wall -- and the anaesthetic record shows total anaesthetic time of 20 minutes and this would not allow time for an unrecorded surgical exploration of the neck with ligation of the internal jugular vein."

The inquiry's experts, Messrs Forsythe and Rigg, have considered the references to the insertion of the central line and they identified four occasions in their report of February 2012 when that is recorded as having happened. In fact, you can also see it on the schedule of surgical procedures. However, they say it was only the insertion of a Broviac line via the left common facial vein on 29 May 1992 that involved an incision

being made in the left side of the neck, and the schedule of Adam Strain's surgical procedures shows the insertion of "a Broviac line, cystoscopy and retrograde pyelogram", having been carried out on that date by Messrs Brown, McCallion and Stewart as surgeons and doctors Crean and McCarthy as the anaesthetists. Adam's medical notes and records show the removal of a Broviac line on 9 February 1995 as having been carried out by a Mr Saad, that's as surgeon, and Dr Chisakuta as the anaesthetist.

So to summarise, what they're saying is the only time that they can see identified when such a line would have gone in is in 1992 and Adam's medical notes and records show that that line was taken out in February 1995, which is obviously before Adam's transplant surgery. The inquiry also requested witness statements from those involved in the surgery on 9 February 1992, and they have confirmed that the left internal jugular vein was not ligated during surgery. And Mr Brown has pointed out that he carried out the cystoscopy and he was not involved in the insertion of the Broviac line carried on the by Messrs McCallion and Stewart.

It is not clear whether they have accepted that, but the important thing is that all three of them do not accept that there was any ligation of the internal

jugular vein during that procedure.

However, the ligation of the internal jugular vein is a matter that will be pursued further during the oral hearing, in particular as to whether it could have had any effect or the effect described by Dr Armour on the development of Adam's cerebral oedema.

THE CHAIRMAN: The end result of that is there's a considerable doubt about whether in fact there was a ligation.

MS ANYADIKE-DANES: There is.

THE CHAIRMAN: And, if there was a ligation, was there still a suture there in 1995?

MS ANYADIKE-DANES: Yes. There is a debate about that. There's also a debate about: if there was a suture there, how might it have got there, and if there was one from some procedure -- and we will have to investigate whether it's possible for that to happen. But even if there was one, what is its likely effect going to be? Can it have the effect or was it likely to have the effect that Dr Armour has claimed for it?

THE CHAIRMAN: Ms Anyadike-Danes, as you've anticipated, we'll stop now for lunch, largely because the stenographer on my left needs a break every one-and-half hours or so and that will be a recurring theme throughout the oral hearings. I'm afraid that in

fairness to all the people who haven't seen this opening in advance, we're going to have to get through it today so that people have an opportunity to hear it being delivered as well as seeing a written copy. That might mean we end up sitting a little late this afternoon. We will come back at 2 o'clock, break for 10 or 15 minutes at 3.30 and then we'll have to resume until this opening is finished. Thank you very much indeed.

(1.10 pm)

(The Short Adjournment)

(2.00 pm)

(Delay in proceedings)

(2.06 pm)

MS ANYADIKE-DANES: I think that I had last spoken about the ligation of the internal jugular vein and said that that was a matter that would be pursued further at the oral hearing, apart from any other thing, as to whether it could have had the effect described by Dr Armour or could in any way have affected the development of Adam's cerebral oedema.

I now want to move on to the transplant experience at the Children's Hospital. This is a question of the experience of the clinicians and the nurses at the Children's Hospital and the Belfast City Hospital in handling paediatric renal transplant surgery. The

inquiry sought and received extensive statistical data from the NHS Blood and Transplant and the DLS on the performance of renal transplant centres across the UK, including Belfast, since 1980 when renal transplants were first performed in Belfast. And the legal team compiled two schedules from that data and three charts to represent the information graphically and hopefully make it more readily accessible.

If I call up 300-021-033. This is UK paediatric kidney-only transplants -- of course, they deal with all transplants -- deceased and living. So that is cadaveric transplants and also from living donors at dedicated paediatric units, by transplant year, transplant unit and age group.

So across the top, you've got the transplant centres. Belfast is a single centre, in fact, but I'll say something more about that. Belfast, Newcastle, Leeds, Nottingham, London Guy's, Bristol, Birmingham, Manchester, Glasgow, and Great Ormond Street, and we've highlighted, in blue, 1995.

They're broken down into two. That's younger than 14 and then between 14 and 17. It can be seen if one looks at Belfast, that Belfast, in general, has a lower number of transplants than any other centre. The closest one having a small number of transplants is

actually Newcastle, but you can see there that they started in the Children's Hospital because although Belfast is a single transplant centre, we have got these figures that relate just to the Children's Hospital separate from Belfast City to make comparisons on the paediatric side.

So you can see they started in the Children's Hospital in 1995, three. Sorry, they started in 1990 with two, and there's one in 1991, one in 1992, one in 1993 and three in 1995 and so on. I'm not going to go through the whole thing; it's there to see the comparisons that can be made. You can see some very high values for other centres.

If I can call up chart 300-082-178. This, in figure 1, is a chart we compiled from the information that we got, and you can see the blue is for the under-14s and then the magenta is the 14 to 17 year-olds. This is actually all paediatric renal transplants from 1990 to 2012. You can see that the over-14s actually is pretty constant over the period. Then you can see that the under-14s bobble about a little bit more, but, relatively speaking, they're constant by the time we get to 1998 in terms of numbers. Then you can see for yourself the peaks and troughs. That's the overall picture.

Then if we go to 300-082-179, now you can make a comparison with the centres. There's Belfast, Newcastle. That's Belfast in total, Newcastle, Glasgow, and so forth all along the bottom. We've got the magenta, which are the 14 to 17 year-olds and the much larger figure, usually, of the under-14s, the blue. You can see how Belfast compares over time with the others.

THE CHAIRMAN: This must relate significantly to the size of population of Northern Ireland.

MS ANYADIKE-DANES: Oh yes, it does. It does. But the relevance of it though is to talk about the experience that any given clinician is likely to have if you have only a certain number of transplants being done.

In fact, actually, precisely that point, Mr Chairman, was made by Dr Haynes, who's the inquiry's expert on paediatric anaesthetics for transplants. He provided a report for the inquiry in August 2011. He said:

"It has been increasingly recognised that there is a need to concentrate specialist services into a smaller number of centres, each with a greater throughput. This is for two reasons. Firstly, such that those involved in the provision of such services have a greater exposure to the difficulties encountered, allowing meaningful audit, research, development of skills and

retention of skills. And secondly, so that any one centre does not become only dependent on a very small number of individuals."

A similar point actually was made by Mr Forsythe and Mr Rigg in their joint report for the inquiry on October 2011, and they refer to the report of the working party of the British Association of Nephrology, "The provision of services in the UK for children and adolescents with renal disease", which incidentally is dated March 1995. In that report they talk about 3 million being the minimum size of population to accumulate and maintain expertise so as to sustain a comprehensive paediatric renal service.

It is going to be a matter for experts and others to consider what one does about providing such a service when you don't have a population of that size and, indeed, concerns over the sustainability of the paediatric renal service remain today. As you know, Mr Chairman, an extract was provided to the inquiry from the 2011 review of renal transplantation services in Northern Ireland by the DLS. That document indicates that there remain concerns about that and the inquiry is investigating the relative experience as at the time of Adam's transplant surgery of the surgeons in Belfast City Hospital and the anaesthetists at the Children's

Hospital in carrying out paediatric and renal transplants on young children.

But as a starting point to that, we have the information from the Freedom of Information request that was made to Belfast City Hospital. There was a response on 29 July 2005, which showed that between 1 January 1990 and 31 December 1994, there were a total of 49 paediatric transplants involving surgeons from Belfast City Hospital, of which 30 were performed at the Children's Hospital, and the response identifies a total of 14 surgeons who were involved in these transplants, but makes it clear that some cases involved two surgeons and not all the surgeons were consultants. I think we can see that, in fact. Can we pull out 094-013K-082?

No, sorry, we can't see it. In any event, that is what that the Freedom of Information response shows. That will be in the papers.

When you see the response, which is in the papers and it's available to you, the names of the surgeons have been redacted, save Mr Keane and Mr McCallion. They were two surgeons both associated with Adam. Nonetheless, it can be seen -- to some extent you don't need the names of the surgeon to see it -- that there was at least one other surgeon who had performed as many transplants as Mr Keane, but it's also clear that none

had what you might call extensive experience.

The position in relation to the anaesthetists is, at present, less clear-cut because the figures that have been provided so far -- so far as I'm aware -- by the DLS have been provided for period 1 April 1993 to 13 October 2010, but without any annual breakdown. So the difficulty with that is that although it shows that Dr Taylor, in that period, had been involved in seven paediatric renal transplants and Dr Chisakuta had been involved in 11, it is not possible to compare their relative experience as at Adam's transplant surgery in November 1995 because you don't know how many of those had been performed before Adam's surgery. But that is an issue which is still being investigated by the inquiry.

Indeed, that whole question of the team, if I can put it that way, and the experience is something that is an issue to be addressed in relation to the information that was given to Adam's mother and the options that were explained to her and it's also an issue that will be considered from the governance perspective.

If we go to another schedule that we were able to compile from the data that we received, if I call that up, that's 300-022-034. That relates to cold ischaemic time. That's just the plain data as we got it. Median

cold ischaemic time by hour of UK deceased kidney-only transplants. The reason for that is there's very little point in concerning yourself about the cold ischaemic time of a live donor because usually there's not much time between the two. So this is cadaveric donors and only transplants at dedicated units by transplant year, transplant unit and age group.

That's how it's provided in the sense that they're grouped together in those three periods. And we have tried to make that a little bit more accessible with a chart that we prepared, and that is at 300-082-180. There we are. There's an awful lot of colour involved there. Each centre has its own colour. You can see that with the exception of that middle period of 2003 to 2006, Belfast was quite a bit higher in terms of cold ischaemic time than anywhere else. Even so, in that period, it is high, and for some reason, which I can't see by interrogating the data, Newcastle also had a blip that year. But in any event, generally speaking, Belfast is high, and as you indicated, one can envisage various reasons for that, geographic reasons.

THE CHAIRMAN: Not quite getting the kidney to the Royal for the transplant?

MS ANYADIKE-DANES: Of course. The smaller a population you have, I presume, the less likely you are that that

population can generate the kidneys that are needed for cadaveric transplants, which means that your kidneys are coming from elsewhere. And if they're coming from elsewhere, if you happen to be in Northern Ireland, then there's strong likelihood that they're coming over the water or for some distance, and that of course adds to the time. The first thing I should mention is that this only starts in 1998 because they're the earliest values, so we don't actually have data for the time of Adam's transplant. But nonetheless, you can see even with the Belfast centre having to deal with those geographic constraints, they are still below 22 hours on that. And in fact, the cold ischaemic time for Adam's donor kidney, the kidney for Adam, the time it was transplanted, was somewhere in about 32 hours. So there is no value on that chart which even approaches the cold ischaemic time for Adam's donor kidney.

How that 32 hours for Adam's case is worked out is that you take 1.42 on 26 November 1995 when the donor kidney was perfused with Baxter's solution until approximately 10.30 on 27 November 1995 when the vascular anastomoses are unclamped. The experts and others providing information to the inquiry advise that, generally, the shorter the ischaemic time, the more likely the kidney is to work immediately and the better

the long-term outcome.

That whole question of the cold ischaemic time of the donor kidney that was offered to Adam is something that is an issue to be addressed, not just in terms of the decisions to accept the donor kidney and proceed with Adam's transplant surgery, but also part and parcel of the information that was given to Adam's mother.

Moving then to the Children's Hospital facilities. The inquiry had photographs taken of the Royal Hospital site, showing layout and interior of the principal buildings involved. Those photographs were taken over the past year and, frankly, an awful lot has changed from 1995 when Adam was admitted for his transplant surgery. In particular, a new building was opened in 1999 to provide and, as I understand it, upgrade accommodation, including for theatres and the intensive care unit. Nevertheless, the original structures and rooms remain, albeit that their use has changed.

So to that extent, the photographs are still useful for showing location and distances, and indeed there is a set that's been compiled effectively as a walk-through, starting from the old and new disused entrance and ending with the main laboratory that would have been used during the first part of Adam's transplant surgery before. That main laboratory is used

because Adam's surgery started before the laboratory for the Children's Hospital opened at 9.30 in the morning.

THE CHAIRMAN: Ms Anyadike-Danes, I don't want to rush you because I know this general opening is important in Adam's case, but this next section, I had the advantage over most people here of having the draft copy. Is there a particular issue about the facilities in the hospital which you need to develop or can you move on?

MS ANYADIKE-DANES: I can move on except for, I think it might be worth just seeing if we can look at the layout to see how the buildings are arranged. The main thing is to do with the layout in terms of the operating theatres and also the laboratories.

So if we go to 300-003-003. I think that should be a layout. Yes. Okay. Etched in red is the Children's Hospital. It's losing a little bit of definition, but you can see, I think, "Musgrave" and that's a ward where Adam was. Then you can see the theatres and then if you come down to the sort of bottom right-hand side, you can see the main laboratories. So that's the sort of distance if, for any reason, children's surgery -- in this case Adam's -- was taking place at a time before the laboratory for the Children's Hospital was open.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: Bearing in mind what you said, I'm

trying to see if I can condense this a bit. 300-006-006. That's the route to the lab from the operating theatres. That's not quite the one I wanted. I'm trying to see if I can find you one. Can we go to 300-084-182? Can we try that? And then I'll just move on if I can't find it. No? Okay.

THE CHAIRMAN: Just to reassure everyone, all of these diagrams and plans are in the papers which have been circulated; right?

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: Later on today, when your written opening is distributed, they will see from paragraphs 86 to 98 the points that you set out in some more detail about the facilities in the Children's Hospital.

MS ANYADIKE-DANES: Well, I can explain, which might be faster than trying to go through the photographs. You will have the photographs available to you so you can effectively do a walk-through with them, and there are, I suppose, four important things to bear in mind in terms of location. One is where the theatre was. Two is where the adjoining theatre was and the relevance of that is that there was a consultant anaesthetist and a trainee anaesthetist, Dr Campbell and Dr Hill, who were working in that adjoining theatre, and as we'll come to shortly, Dr Hill's recollection was that

Dr Campbell was called into Adam's theatre because Adam was slow to wake up. So that's where that theatre was, and you can see the two of them.

Then there is a picture of -- if you bear this in mind -- the dirty room, and that's where they would have been cleaning and disposing of instruments and Adam would have passed through that. And then there is also an anaesthetic room, which wasn't actually used as an anaesthetic room, and there's a room where Dr Montague was working, so these are all key areas for you to see. And when you're provided with a copy of this opening, you'll be able to look at that, and when you get all the supporting documents, in conjunction with that, and see where all these places that were important at the time for Adam actually are located.

One of the site diagrams that I would like to take you to is the one that shows you where the blood gas machine is. But I'm not sure we have that one available to us. Do we have 300-005-005? No? Okay. Well, as you read the opening when you get it, you will see where that blood gas machine was and that, of course, is the blood gas machine that they used to test Adam's blood at about 9.32 during the course of the surgery.

Actually, I think we can see that. We can see a photograph of it. That probably doesn't illuminate

you much further.

The Children's Hospital had its own laboratory, as I've just mentioned, which, when you get the lower ground floor plan, you'll be able to see it on there. That was actually very close to the operating theatres in the Children's Hospital, but unfortunately it was only available during the hours of 9 and 5. You will be able it see its proximity from those walk-through photographs. Adam's transplant surgery was scheduled to start at 6, so whenever it was scheduled to start at 6, it would have been appreciated that they would not have access to the Children's Hospital's laboratory. It was then postponed to 7, and they would still have appreciated that they would not have access to that laboratory. So undoubtedly, it started considerably outside the hours of operation of the Children's Hospital's laboratory.

And should the need have arisen, as it did, to use the laboratory, then -- well, should the need have arisen before 9 o'clock, then they would have had to have gone to the main laboratory for the general Royal complex, and that laboratory is in the Kelvin Building and its route and its distance from the operating theatre is shown on that site plan, which is the first one I pulled up for you. There's a set of photographs

that literally walk you down there, and you gain, just by looking at them, some appreciation of what would have been involved if you suddenly decided in the operation that actually you needed urgently to receive a laboratory result of a particular sample, what that would have involved in terms of somebody getting that sample from you, getting it to the lab, getting the result through phoned through to you or taken to you.

So the equipment and the facilities that are provided by a paediatric renal transplant centre are commented on by Dr Haynes in his report of 2 August 2011. And he particularly identifies access, 24 hours a day, to a blood gas machine within the operating theatre suite or in close proximity, adequate portering services for tasks such as the transport of specimens to the laboratory, the transport of blood for blood transfusions to the operating theatre, adequate numbers of suitably located telephones to allow easy contact with the laboratories and other hospital resources. And the significance of all of that is that, until February 2012, Dr Taylor consistently gave the lack of adequate facilities and services as a reason or an explanation for the absence of any electrolyte results before the transplant surgery began and before the blood gas machine result at 9.32. And he pointed

out that the test -- in fact, actually, in relation to the blood gas machine results, he pointed out that that test wasn't intended for Adam's electrolytes because he regarded the blood gas machine as incapable of providing accurate results. In fact, he claims he was warned not to rely upon it for that very purpose. Rather, the reason he was testing Adam's blood at that time was to enable him to check his haemoglobin levels, which had fallen to 6.1.

But that is the significance and now that we have Dr Taylor's statement. There will be issues in relation to what he described as the constraints in terms of earlier testing of electrolyte results and they will be pursued in the oral hearing.

THE CHAIRMAN: And your general point is that, until February 2012, Dr Taylor said: we didn't have adequate facilities and services and that's why I didn't seek electrolyte results and I didn't carry out other tests? And on 1 February 2012, he volunteered a statement in which he said that he should have sent the electrolyte sample in before the operation started, he should also have sent other samples as necessary and used those results to adjust the rate and type of intravenous fluids. So he changed the position which he'd held from 1995 until 2012.

MS ANYADIKE-DANES: He has certainly changed his position. Whether or not he still regarded -- and any of the other clinicians regarded -- there to be a time issue in terms of getting results back is another question. He certainly took the view that he hadn't taken before, that it's something he should have done.

THE CHAIRMAN: Yes.

MS ANYADIKE-DANES: If we turn now to putting Adam on the transplant list. Adam's renal function deteriorated to a level where he needed peritoneal dialysis. That is a form of dialysis for children like Adam with severe chronic kidney disease. The process uses the patient's peritoneum in the abdomen as a membrane across which the fluids and dissolved substantials -- whether it's electrolytes, urea, glucose and albumin -- are changed from the blood and fluids are introduced via a permanent tube in the abdomen and flushed out either every night while the child sleeps, which is called automatic peritoneal dialysis, or via regular exchanges throughout the day, and that's continuous ambulatory peritoneal dialysis.

Dr Savage discussed Adam's deteriorating renal function and his need for dialysis with his mother during a dialysis clinic on 2 November 1993. And it was his plan, so he has said, to have Adam registered for

a transplant at the same time as he went on dialysis, and he explained that in a letter of 3 November 1993 to Dr Scott, who I believe was Adam's GP:

"Certainly, if we get to the point where I feel he needs dialysis in the near future, my plan would be to put him on call before he needs dialysis or a transplant."

And as can be seen from the schedule of Adam's surgical procedures, which I pulled up this morning -- but I'm not going to pull it up now -- Adam did have a continuous ambulatory peritoneal dialysis catheter inserted in July 1994. And Dr Savage arranged to have Adam's tissue typing carried out with a view to putting him on call for a renal transplant and he was registered as a possible recipient with the United Kingdom Transplant Support Service Agency on 14 July 1994.

Sorry, I'm being assisted by my junior. I think he had the catheter inserted on 23 March 1994 and then he had the peritoneal dialysis catheter inserted in July 1994.

It seems that Dr Savage may have been the only consultant clinician involved in the process of having Adam placed on the transplant register and the inquiry witness statement from Adam's mother, which is dated 10 January 2012, indicates that the provision of

relevant information to her on renal transplantation for Adam was provided by Dr Savage. She states that Dr Savage was the person involved in assessing Adam before he went on the transplant list. That is an issue to be pursued during the hearing as to the process by which Adam was placed on the transplant register, who should have been involved in it and what should have been explained to his mother. They are all issues that we will be pursuing.

Adam was fully registered in November 1994 after the tissue typing and that registration form is a detailed document. It makes provision for matters such as his blood group, his type, his HLA data, the level of acceptable mismatching that would be tolerated, the sensitisation status and the person responsible for the information on the form. In fact, we can see that form, 057-070-131.

This form has more than one page, and I think, unfortunately, only one page is here. But in any event, you can see -- this is page 2 -- the sort of detail. And if you go up to the top there, under "ABDR", that is the degree of mismatching to be accepted. And then the sensitisation status. There it is there. Then you have, at the bottom, the date of it and that the form was checked by Dr Savage. The first part of it

would have given his HLA data.

This information is what allows the transplant centre to consider the donor kidney -- or at least the kidney that was being offered to Adam from the Glasgow Southern General Hospital -- was a sufficiently good match to offer it at all for him. That's where they're getting their information from. And Dr Savage states in his inquiry witness statement of 14 April 2011 that he explained the system of being on call for a kidney transplant to Adam's mother and the need for a fast response and immediate tissue cross-matching for the donor kidney, if one became available. And he also says that she received an explanatory booklet, "Kidney transplantation in childhood, a guide for families", which is dated 1993. That particular document is compiled by the paediatric renal unit at the City Hospital in Nottingham. And the guide states under "What assessment is necessary":

"Placement on the transplant waiting list follows discussion with the kidney specialist and transplant surgeon."

In any event, Adam's mother states in her inquiry witness statement that none of the information given to her on renal transplants by Dr Savage or anybody else, for that matter, was provided in written form. That's

obviously an issue that needs to be pursued as to exactly what she got and what she could have been expected to understand from it.

THE CHAIRMAN: And in terms of the Nottingham guide, the kidney specialist would have been Dr Savage?

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: And it says "transplant surgeon". That may or may not have been Mr Keane. It didn't have to be --

MS ANYADIKE-DANES: No, it didn't have to be.

THE CHAIRMAN: -- as long as it was a transplant surgeon?

MS ANYADIKE-DANES: A transplant surgeon.

Can we go to the timeline again at 307-001-033? This is a different page of it, this is now page 32 of it. And if you go on to the dialysis prescription and cycles, you can see that on 24 August 1994, he commenced his Pac X, that's his dialysis, this afternoon, and it gives you the number of the cycles.

Incidentally, if you look across you can see what else was happening. There it shows you the insertion of the peritoneal catheter for his PD line and the central line being inserted. That's relevant, as I had spoken before about how many central lines he had.

If you look at the top, another issue being flagged there: anaemia. That is one of those issues that the experts consider a relevant thing to know about Adam's

condition and there it's being recorded there.
If we look at this, we can see over these pages there are a number of these red-line issues. So he's just under on haemoglobin, so that's 23 August 1994, which probably is to be expected given that he's being recorded as anaemic. And if you look at the top, you see the actual range is 11 to 15, so he's 7.9 and he's recorded as that again on 25 August and on 2 September. And then if you just go a little bit down, still 2 September, you can see that there's education, how to use that dialysis machine.

The dialysis he was receiving was 11 cycles, using 300 ml of 1.36 solution. Initially, actually, right at the start when he started he was receiving six cycles of 300 ml of volume overnight, five days a week. That then went up to eight cycles and that was then increased to ten cycles of 600 ml. And by the time of his transplant, 14 months after he was initially placed on the transplant list, he was receiving 15 cycles of peritoneal dialysis overnight using 750 ml fills of 1.36 per cent Dianeal solution. That's relevant in terms of what was the actual dialysis that he received the night before his surgery and what is the relevance of whatever it was.

In the months leading up to his transplant, Adam

received feeds through his gastrostomy tube, and they consisted of three bolus feeds for the day. I know Adam's mother is here and she was intimately, of course, involved in all of this. But for everybody else who doesn't know how Adam was being cared for, some of these details, I think, are helpful to recite, and I don't intend to cause any concern, if that's what this is doing.

So three bolus feeds per day each in the morning, early afternoon and evening and then 1200 ml over approximately 8 hours overnight, and they were made up as a prescription of 1,000 ml of Nutrison, 50 grams of Maxijul, 50 ml of Calogen and 100 ml of saline made up to 2,100 ml by water. And he would receive sodium and iron supplements in his feed to prevent him from having these episodes of anemia and low sodium.

As I indicated to you from the timeline, Adam's mother was trained in the use of the automatic dialysis cycle machine some time around the beginning of September 1994. She maintained a detailed record of Adam's dialysis at home in a dialysis book and that book and all its records is attached to her second witness statement for the inquiry. That contained details of Adam's weight before and after dialysis, first drain, the manual drain, ultra filtrate, and she recorded his

blood results, feeds as well as queries and observations of Adam, such as she recorded temperature drops, if he were to get at all shaky with them. And Dr Savage considered Adam's mother to be absolutely meticulous in her approach to Adam's home dialysis.

Adam's admission and his pre-surgical events. From photographs taken of Adam just over a fortnight before his renal transplant, show him looking happy and well, and I'm just going to pull one up because how he presented his condition before surgery has proved to be something that is -- something to be considered. That is reference 300-079-150.

That's Adam to the bottom left, just crouching there by the table.

THE CHAIRMAN: It looks like party time.

MS ANYADIKE-DANES: I think it was party time, actually. His mother described him at that stage, notwithstanding his renal problems, as being back on top form again. He was really well.

So receiving the offer of a kidney. This now is the key period with regard to Adam's case. And it starts with the offer of a donor kidney on 26 November 1995. And unfortunately, it ends with his death on 28 November 1995. But during that period there are key events of Adam's admission to Musgrave Ward at

2000 hours, his arrival at theatre at 0700 hours on 27 November for his renal transplant surgery, his admission to paediatric intensive care unit at the end of his surgery at around 12 noon and the withdrawal of ventilatory support at 11.30 on 28 November. And the vast majority of issues relating to Adam's case occurred during that period, particularly the management of his fluids during perioperative stage.

We have compiled a chronology of events, clinical matters, that detail the clinical events that occurred over that period. Can we have, please, 306-003-006? There it is. A very simple chronology: just the date and a time, if it's relevant, and given that we're only talking about two days, it almost always will be. There are some events for which we just don't have a time, but we sometimes have the order, in which case we just put them in that order. Then you have the event itself described and then, as always, if we can do it, we put the reference of a source of the information for whatever is stated in the event.

In the footnotes, we have clarification points just so that if you're unsure what "perfusion with Baxter's solution" means, then you go to the glossary of terms. If you're not sure who the relevant person is, then you're directed to the list of persons. And if there is

some other query or observation, then it's recorded in the footnotes.

It is compiled almost exclusively from Adam's medical notes and records. It does include some matters from other sources such as the depositions or PSNI statements, but that's generally where there is no other source and the information in question has not been queried or challenged. We have tried to ensure that the details in the chronology are not contentious and that it can therefore act as a useful reference document when considering the various issues in Adam's case. To that end, the inquiry's sent the chronology out to all the interested parties on 5 January 2005 -- I don't think it was 2005; I suspect it was 5 January 2012 -- for comment and, since then, the chronology has been updated to reflect the subsequent receipt of documents.

An example of that, 306-003-008. An example of that is to do with the chest X-ray. If you see, there's the second box down, a question mark. Then you can see the pre-surgery chest X-ray was requested by Dr O'Neill, and, if you go to the reference section, you can see the reference for the actual request form. But then, if you go down to the note, footnote 28, you will see that no chest X-ray has been provided that corresponds with that request. So we don't actually have a chest X-ray that

corresponds with that request. We sought it, obviously, and there is now a query in the correspondence from the DLS whether such an X-ray was actually performed. And that letter that addresses that is referenced: it's in the documents, so you should be able to see it.

That's an issue that will have to be pursued as to whether it actually was and it's simply been lost, or it wasn't and, if it wasn't there will be an issue as to why wasn't it when the request was there. And a further example is -- we can see that at reference 306-003-009. If you see that second box before midnight: a further blood specimen was taken for biochemistry and hematology analysis, and it's given the reference for that. The actual lab result came back some time, presumably in the early hours, of 27 November, and what's there under "event" is actually the results from it. And you can see it bears the same reference as the information on the blood specimen.

That lab result is from a blood specimen that was taken before midnight on 26 November and therefore on 26 November 1995. It shows, assumed sodium level of 133 millimoles, which is lower than the previous value from the blood specimen that was taken at 2100 hours. That value was 139 millimoles.

This is an issue to be pursued in terms of record

keeping, but the 139 serum sodium level is not accompanied by any lab result. We have sought it and we haven't been given it. Some of these, as you may recall, Mr Chairman, were mislaid in some way. What we have is we have a blood specimen that seems to be taken probably, we think, around about 11 o'clock. And that shows a serum sodium level of 133. But because that laboratory result was not in Adam's clinical notes and records -- in fact, it's only very recently that we knew it existed -- so all that anybody would have seen, unless they'd seen it earlier and hadn't noted it in these notes and records, is the one from 9 o'clock at 139 millimoles.

So as I say, Mr Chairman, that's going to be an issue as to the recording and how that occurred. It's also going to be an issue as to what, if anything, is the significance of that fact. Anyway, I don't propose to go through the chronology and all that it shows in detail because it's there, Mr Chairman, and I'm conscious of the issue of time. It's just so far as we have been able to do it, goes through all the timed and recorded events for Adam from the -- actually, it starts, as I said, with perfusion of blood, in 142, in Glasgow, and then it ends with the removal of ventilatory support. So everything that we have been

able to glean from his medical notes and records is set out there in the order and with the time that we believe it happened and reference to the document from where we got the information. It's something that we hope will be useful and that we can turn to it through the oral hearing just to reference ourselves as to what was actually happening and who was involved in it.

Let me go now to deal with another issue, which is the issue of the trainee anaesthetist. The anaesthetic record for Adam's transplant surgery shows that Dr Taylor was assisted by Dr Montague for the renal transplant. Dr Montague was senior registrar in anaesthesia at that time. However, whilst the anaesthetic record might suggest he was there for the duration of the surgery -- well, it might do; it simply has him there as the assistant -- he claims that that wasn't the case. Dr Montague states in his PSNI statement of 30 November 2007 that he had been on call for the night of 26 November 1995, and that although he was present at the start and assisted with preparing Adam, including the epidural, Dr Taylor sent him home just before the start of the transplant surgery.

Dr Taylor accepts Dr Montague's account of events. In his inquiry witness statement of 16 May 2011. So after the statement by Dr Montague. He states:

"After the start of the surgery, another trainee, whose name I cannot remember, came on duty to assist me, and I was able to let Dr Montague go home as he had been on call for 24 hours, as he confirms in his statement."

The precise time at which Dr Montague left is uncertain. It seems that it was prior to 9.32 when the blood gas result was obtained, and it may have been around 8.30 to coincide with the anaesthetist registrar's coming on duty. Dr Taylor is quite clear in his evidence to the inquiry that Dr Montague was replaced in the operating theatre. As he states in his statement, dated 3 October 2011:

"I would not have allowed [Dr Montague that is] to leave unless an appropriate substitute replaced him."

Dr Montague made no reference to a substitute in his statement to the PSNI, but the inquiry asked him about the possibility of him being replaced by another registrar and he stated in his statement:

"There would have been some of the other anaesthetist registrars starting work in theatres at the Children's Hospital at approximately 8.30 and one of those registrars would have been available to assist Dr Taylor."

And then he says:

"I don't know which registrar replaced me."

None of the other members of the transplant team and neither of the consultant paediatric nephrologists has mentioned the presence of a trainee anaesthetist during the transplant surgery other than Dr Montague itself. And the correct identification of all those in the operating theatre, particularly anyone present from about 9.30 onwards, is a matter of considerable importance to the inquiry and it has pursued its investigations into that as far as it can.

The inquiry subsequently received a letter dated 17 August 2011 from the DLS, and that letter provided a list of junior anaesthetic trainees who were attached to the Royal Group of Hospitals on the date of Adam Strain's transplant operation on 27 November. And they formed the pool of potential trainee anaesthetists from which to identify the person who Dr Taylor says assisted him in the operating theatre after Dr Montague's departure.

All of those on the list were identified and the inquiry sent each of them witness statement requests to ascertain, just in the first instance, whether any of them could have been present in the operating theatre on 27 November 1995 during Adam's transplant surgery. Witness statements were received from all of them, but none of them have claimed to have been there.

We have produced a schedule of that group and what they say. I can call it up now. It starts at 306-002-004, "Schedule of possible trainee anaesthetists assisting Dr Robert Taylor in Adam's transplant surgery". Down the left-hand side are their witness statement numbers and they go sequentially. That's to locate them if anybody should have a query about anything. Those are their names and this is what they say. It's not all that they necessarily said, but it is a summary of what they said in relation to this particular issue. It can be seen that for the most part they confirm they were not involved and for some of them it's quite easy: it's because they were out of the jurisdiction or they were not working for the trust. In that category are doctors McNamee, Gilliland, Bunting, Trinder, Kelly, Kumar. They are all in that sort of category.

Then there's doctors O'Neill, Bedi and Kerr, and they just don't recall Adam's case, although Dr Kerr goes so far as to say she believes she would remember it if she had been involved.

Dr Bedi identified a Dr McBrien as possibly being the on-call trainee, so we sought further information from Dr McBrien. He was contacted and he's provided two inquiry witness statements, one dated 30 September 2011

and the other, 14 February 2012. The first one, he states that the theatre log for 27 November 1995 -- a theatre log is a document, which you all have, and in fact it's exhibited to one of the witness statements, the witness statement of Dr Rosalie Campbell in a sort of A3 -- a bit like a spreadsheet -- but it's much easier to read in that way and you can see across it who was in what theatre, with whom, and at what time and with which surgeon or anaesthetist and the procedure that was involved, so it's quite a useful document for seeing in what order people were meeting each other over that particular day. It says that:

"The theatre log shows that I anaesthetised two cases at 18.30 and 20.05. It is my recollection that on a weekday such as this, the trainee anaesthetist on call overnight came on duty at 13.00. This would indicate that I was not in hospital that morning."

In his second witness statement request, he explains that.

"The trainee anaesthetist on-call overnight went off duty some time between 8 am and 9 am as it was deemed not safe for him to continue working after a night on call. The trainee anaesthetist starting at 13.00 was routinely allocated to an elective list for the afternoon, taking over emergency duties in the evening

after that afternoon list had finished."

The theatre log referred to by Dr McBrien shows the date of each operation carried out in that particular operating theatre, as well as the patient's details, the diagnosis, the nature of the procedure, whether the classification of the operation was major or minor, the name of the surgeon, the name of the anaesthetist, the particular ward, the namely of the scrub nurse, and the times of arrival and departure. That does include, in certain instances, the names of those who assisted, so it is possible to see one name/another name. However, although that's exactly how the column with "surgeon" is entered for Adam's surgery in the sense that you see "Keane/Brown", the name under the anaesthetist column shows only Dr Taylor's name. So it's not slash with Montague or, for that matter, anybody else; it just bears his name. So it's unknown whether there was a trainee anaesthetist who assisted Dr Taylor in the operating theatre after Dr Montague's departure and if so, who it was. What you have though is a very strong assertion from Dr Taylor that he was assisted in that way.

Mr Chairman, the fact that we don't actually know exactly who was in an operating theatre when the end result of the procedure, or whatever happened during

that process, is that a child dies, is something that we will look at in the course of governance or we'll look at it from the governance perspective.

THE CHAIRMAN: But before moving on to governance, if you look at it in the clinical perspective, we also know from the figures that it's very unusual for a child to die in transplant.

MS ANYADIKE-DANES: We do know that.

THE CHAIRMAN: We know from a number of reports and statements from those involved that Adam's death was totally unexpected, so it's very hard to understand how any trainee anaesthetist who was there could possibly have forgotten the event.

MS ANYADIKE-DANES: Well, I understand that, and given, as you say, how few transplants happened, it's very possible that it would have been the trainee anaesthetist's first, and if you're trying to see something of that sort and it ends in the way it ended, I understand, it's difficult to see how you might forget that. But even if that's -- and that is a real question, and it will be so as we -- when the witnesses are called and you will see references in their witness statements as to whether they recall this or they recall that. Doubtless, Mr Chairman, you'll be bearing in mind, how much an outcome like that is likely to have

stayed with somebody.

THE CHAIRMAN: Yes.

MS ANYADIKE-DANES: So yes. And it is definitely an issue from the clinical perspective and we will definitely be looking at it and pursuing it in the hearing on clinical matters, but I simply wanted to indicate also that it has other implications for governance: the fact that you can't know that and therefore one can't, if one's engaged in the process that we are doing -- or for any purpose for lessons learned -- know exactly who was involved.

Dr Hill, I had mentioned him earlier, was also a trainee anaesthetist at the time, and he has provided a witness statement to the inquiry dated 12 October 2011. He wasn't able to assist further the investigation of who was the likely trainee, he didn't know, and it certainly wasn't him. But he did open up the prospect of another person being in the operating theatre whilst Adam was still there. He described working with Dr Rosalie Campbell. She was the locum consultant anaesthetist in the adjoining operating theatre to the one where Adam's transplant surgery was taking place. That's why, when one looks at the site plans and the photographs, it is worth bearing in mind quite how close those two operating theatres were.

He said in his witness statement that:

"My recollection is that at some stage during our work on the day in question, which was in an adjacent theatre, the consultant anaesthetist who appears to have been Dr Rosalie Campbell left to assist Dr Taylor because a patient, who I now to be Adam Strain, was slow to wake up."

Well, we asked Dr Campbell to provide a witness statement, which she did. She's provided two, in fact. The first one was dated 7 April 2011; the second one is dated 8 October 2011. The first one, as you will appreciate is before we had the witness statement from Dr Hill, and we were asking her, as we have asked all those who in any way were involved with Adam, for a description of the nature of their involvement with him. And in fact, the only issue in relation to Adam which she raised in her first witness statement was that with reference to assisting Dr David Webb. She was the second doctor in the performance of the first set of brainstem testing. She deals with the operating theatre issue in her second witness statement request and because we're asking her about it.

In the main, she responds -- and it is there are for you to see -- to all such queries by stating that she has no recollection. That's a matter that will be

pursued in the oral hearing.

Turning now to the anaesthetic nurse. This is another identification issue. And also one raised by Dr Taylor. This time, in relation to the presence of an anaesthetic nurse during Adam's transplant surgery. He stated in his inquiry witness statement dated 18 July 2005, which he made just before the inquiry's work was suspended, that:

"At 0700, I worked closely with Dr Montague and the anaesthetic nurse to induce anaesthesia and provided all the technical skills necessary to secure the airway breathing, access to intravenous lines, arterial access, central venous access and epidural catheter placement."

The issue was raised during the course of the PSNI investigations, which started in Adam's case in about July 2005 and Dr Taylor was asked about his statements on the presentation of an anaesthetic nurse during the course of his interview under caution on 17 October 2006. He stated that:

"My knowledge is that there has to be three nurses present before an anaesthetic is commenced."

As a result of Dr Taylor's evidence, both staff nurse Popplestone and staff nurse Mathewson made PSNI statements. You'll recall that both of them were in the operating theatre at the time. Staff nurse Popplestone

was the scrub nurse and staff nurse Mathewson was runner. Staff nurse Popplestone stated in her statement for the PSNI:

"I cannot be certain. However, from my experience, it is possible that the anaesthetists had the assistance of a nurse and, possibly, an operating technician."

And staff nurse Mathewson said:

"I can say from my experience that in an operation such as a renal transplant on a child, as well as the surgeons and anaesthetists, I would have expected a scrub nurse, a runner and a theatre technician with probably an anaesthetic nurse as well."

We know that there was a scrub nurse: that was staff nurse Popplestone. There was a runner: that was staff nurse Mathewson herself. And there was a theatre technician: that was Peter Shaw. What we don't know is what happened about the suggestion or the evidence from Dr Taylor that there was an anaesthetic nurse. So the inquiry pursued the matter. We asked the DLS, and in September of last year, 5 September, the DLS provided a list of theatre nurses employed by the Royal Group of Hospitals trust as at 27 November 1995.

Mr Chairman, I should say something a little bit about this. There is an issue as to whether there is anybody called an anaesthetic nurse. So whether that is

a title or whether it is actually a role.

THE CHAIRMAN: Is that in the sense of it is something that's now a title, but which was not necessarily a title in common use in 1995?

MS ANYADIKE-DANES: Well, that's one of the things we will have to explore. Certainly, without any particular prompting, so far as I can see, staff nurse Mathewson refers to an anaesthetic nurse. Whether she was referring to that meaning somebody who carries out the role or function of an anaesthetic nurse or whether she was referring to that as somebody who has the title of anaesthetic nurse, it's something that we are exploring. But I think, sir, there may be something in that, that what was essentially being talked about was somebody who had the training of a theatre nurse and could perform those sorts of functions. And when they were doing that, then they were acting as an anaesthetic nurse. But in any event, it's one of those issues that we're going to clarify.

It didn't make any difference whatsoever to how we pursued the investigation because we simply asked for a list of everybody who was a theatre nurse, and pursued all of them. We located them all. Well, we located all those that were provided to us on the list. We have no other independent way of knowing, so everybody that was

provided on the list we located, and we sent out inquiry witness statement requests to ascertain whether they could have acted as an anaesthetic nurse for Dr Taylor during Adam's transplant surgery. We did receive responses from all of them, but none of them claim to have been the anaesthetic nurse or to have performed that role.

We have compiled a schedule of all of that. Of course, their statements are there and you can look at each and every one of those statements, but the schedule can be seen at 306-002-003, "Schedule of possible anaesthetist nurses". Here they all are and it's exactly the same structure as the one for the trainee anaesthetists. Some of them, of course, say they are not in the jurisdiction or they were actually auxiliaries, and they couldn't have done that. 217 is in that position, as is 215. But there are their responses and a few of them say they don't recall. Some of them are positive, saying they definitely weren't there, and some of them say it couldn't have been them. Well, Mr Chairman, it'll be a matter for you ultimately to determine where we stand on the anaesthetic nurse point, but after we have pressed that matter further in the oral hearing.

As I indicated to you before, in terms of the

trainee anaesthetists, it's also not just a clinical matter, it's a governance matter. If I can go to fluid balance.

The management of fluid balance and the choice and administration of the intravenous fluids, that is a key element of the terms of reference. In fact, it's a specific element of the terms of reference. And it has been the subject of detailed queries from the inquiry in witness statement requests, as well as briefs to the inquiry's experts. And it is an area which is far from straightforward and the arguments made by the clinicians and the experts are to a large extent dependent on the assumptions that they have made about the clinical information, which is not available. Some of that information that is not available, about which they have to make assumptions, is Adam's serum sodium level at the start of the anaesthetic and his urine output during the surgery. And furthermore, the clinicians and the inquiry experts -- well, when we started to investigate it with them, did not all present their calculations in a way that easily permitted comparison, and that was a difficulty because it wasn't possible to know whether there were real differences or they were just proceeding upon different bases.

So in an effort to bring some consistency to all

their various approaches and permit them to be more readily seen or permit us to see where the differences really lie and why, with the guidance of the advisors, we developed a standard table to display the essential elements of the fluid balance calculations. And we sent that table to Dr Taylor and to the inquiry's experts, Dr Coulthard, Dr Haynes, Professor Gross, and they all were asked to display the calculations that they had already made, and either, in the terms of Dr Taylor, were reflected in witness statements, or in the case of the inquiry's experts, were reflected in their reports. They were asked to display their calculations on that standard table.

The completed tables for Dr Coulthard and Dr Haynes are provided as part of their further reports. Professor Gross provided the data, and that was subsequently inserted into a chart, and Dr Taylor's completed table is provided as part of his witness statement, dated 9 January 2012.

Then we had a series of these tables with all their calculations and what we then did is we compiled a comparison table. In fact, you can see that at 300-077-141. The object of that was to try and put in one place the calculations that they all made. So let us start with the display of Adam's daily fluid balance,

which is what that is. This shows the position of each of the inquiry's expert witnesses -- so that's Dr Haynes, Professor Gross, Dr Coulthard -- and actually we include Dr Sumner in that because he had calculations as well and he was an expert witness at Adam's inquest. And then also we added Dr Taylor and Dr Savage in relation to what each of them believed to be Adam's daily input and output of fluids prior to his surgery. So we were really trying to get at their starting assumptions.

So firstly, there's the assumption for each of them, by each of them, as to his weight and surface area. You can see that if you look at the -- weight's not too difficult to see. They don't really deviate very much. The surface area, there's not very much difference there either. They're used in the calculation of losses. They all agreed that Adam's daily fluid intake was 2,100 ml. His fluid losses are divided into four areas: the losses from perspiration and water vapour in breath, and that's known as insensible losses, and can't be accurately measured, they're just estimated. Secondly, there's a fluid loss in the course of dialysis. Thirdly, faecal loss, and finally there's urine output, which can be seen in the substantial loss per day.

Each of the experts and witnesses calculates the

urine output by subtracting the insensible dialysis and faecal losses from the daily intake of 2100 ml, and it can be seen the estimated urine outputs vary from approximately 55, Gross and Haynes, to approximately 80 from Dr Taylor. So he's slightly to the right of them. Dr Taylor's calculation of urine output here is significantly -- this is, I think, important to note.

THE CHAIRMAN: Dr Taylor, box B, urine output?

MS ANYADIKE-DANES: Yes, I am. This is compiled from his own chart, which he sent on 9 January 2012, so we've had an awful lot about Dr Taylor's calculations from when he gave evidence to the Coroner, when he gave evidence to the PSNI, and when he gave previous witness statements. This is him now being asked to record his calculations in this kind of format. This is the first time it happens, this is the beginning of this year. His calculation of urine output is significantly reduced from his earlier assertion that Adam would pass around 200 ml per hour of dilute urine.

He commented in his last witness statement to the inquiry -- that's the one of 1 February -- I think Mr Chairman, you were reading from it a while ago. 1 February this year -- that he has reflected on this and he now recognises that Adam had a fixed urine output of around 70 to 80 ml per hour and he further stated

that the intraoperative fluid that I administered was based on this incorrect assumption and I therefore administered a hypotonic fluid at a rate in excess of his ability to excrete it, particularly in the first hour of anaesthesia."

THE CHAIRMAN: His incorrect assumption was 200 ml an hour, and that's reduced, as you have indicated in this chart, to 78.1?

MS ANYADIKE-DANES: That's correct. The rate of administration of the first hour, we'll come to that in a minute, and we'll see just how much was administered in that first hour. So now, the remainder of the comparison table shows Adam's fluid balances between 2200 on his arrival in theatre to 0700 hours on 27 November, and during the course of his surgery until its conclusion and his admission to PICU at 12.15.

The calculations and assumptions for each of the inquiry expert witnesses mentioned, plus Dr Taylor, in each of the time periods is displayed, and you'll see the entire chart, Mr Chairman. Each of the experts and Dr Taylor also gave their comments on the concentration of sodium in each of the solutions that Adam received, and any reasons why planned fluid infusion, whether its content or the infusion rate, should change due to changes in estimated loss.

And an important additional factor to consider here is that of blood loss. Dr Taylor calculated Adam's blood loss during surgery to be 1,128 ml. He did that by examining the blood loss record and the swab count and this figure is based on the difference in weight between dry and blood-soaked swabs -- and they are 411 ml -- and the volume of liquid in the suction bottle -- that was 500 ml -- and also what he referred to as a visual estimation of the amount of fluid on the surgical towel. That differs from Mr Keane. He has subsequently estimated the blood loss to have been only 468 ml, and he bases this on the fact that 600 ml would have been made up of urine, peritoneal dialysis fluid and slush dialysis, which is used to pool the kidney until the vascular anastomoses were complete. That reference to urine, Mr Chairman, you'll recall that one of the issues that we are pursuing is why the urine wasn't measured or couldn't have been measured in any way. So part of the reason why these assumptions have to be made or are being made is that there is important recording information that we simply don't have. We don't have it and they didn't have it at the time, it would appear. The issue of what the surgical blood loss was and whether Dr Taylor's -- whether he estimated that appropriately during the surgery and responded

appropriately to it regarding Adam's fluid management that is something that we will investigate during the oral hearings. We're also going to investigate if whatever blood loss there was was reasonable in the circumstances.

If I move now to the next stage, which is inducing anaesthesia and Adam's transplant surgery. I had mentioned before about Adam's condition going into his surgery, but I had done that from the point of view of, when we looked at the timeline or the summary of it, he seemed to have had a period where he was relatively free of some of those matters that had been causing concern, and then I presented you with a photograph of how he looked physically and also his demeanour and his mother's description of it. Now we look at his condition from a clinical point of view going into the surgery.

We have summarised the information that was known about Adam's condition going into surgery from his medical notes and records in a chart on his pre-surgical state, and that's at 306-006-040. There is a second page to this chart, which shows the sources for all that information and when you have it, you will obviously have all of that. So the fact that there aren't sources, as there are on all our other compiled

documents, doesn't mean that we just developed these ourselves.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: So what it includes is, as you can see, the pre-admission details. So his last diet sheet, that's him coming in, and that's what his diet was made of. We know what his normal dialysis was, so that's part of that. We know when his last prescription of erythropoietin was, and we know what it was. We know his sodium bicarbonate and how that was provided. We know about his Fersamal -- he had 4 ml daily. We know the level of his serum potassium. At least we know the dates of when those things were last measured and we know his last surgical procedure and the date of it. And if we want to, we can go and look at the records and see what is said about it.

So then from admission through to the surgery itself, we have these observations of him and along the time, so there's an observation, "Chest clear, alert and well". Round about there is where one would be wanting to look at the chest X-ray, I suspect. Some of these things will be an issue as to how people knew those things. And then we know that at 7, he was still polyuric. We know his weight because it's recorded. We know his height, we know his temperature on those

particular times. We know his heart rate at those particular times, and what it was, and respiration and so on. In terms of his fluids, that's an important one. We see that his gastrostomy stopped, because it tissued, at around 130. He was taking -- sorry, the IV tissued, so they had to add his fluids through the gastrostomy. Then we see his dialysis, we see his blood pressure, haemoglobin. These things are quite important for his condition, the haemoglobin and white blood count and we see the serum sodium and we see the 139 and what we think was the sample taken round about 11 o'clock. We see it's 133 at that stage. So that's what's known of Adam.

When one moves into the operating theatre time, we have compiled schedules of the results of the recordings made during what's called the perioperative period, and that's a period from his arrival in and departure from, between those times, the operating theatre. And we have shown his vital signs, the drugs administered, the temperature, the central venous pressure and the fluids administered and lost, his oxygen saturation and end tidal carbon dioxide, and his serum sodium and haemoglobin levels, all taken from the records that were made at the time. In fact, can we look at 307-006-063.

That's the data, that comes from his records. You can see chart 1 showing his vital signs -- that's his heart rate, blood pressure -- and chart 2 is going to show his drugs. They're relevant -- at least we are told that they're relevant when one looks at the debate amongst the experts as to actually what he received and when he received it and how much of it he received.

Can we go to the next page, which should be 064. This is chart 1 that corresponds to that and there's his heart rate, his blood pressure. You can see how that moves in terms of his heart rate, which is blue, it moves about. You can see the periods when it falls and the periods when it rises, and it'll be for the experts and clinicians to see why you can see those changes over the period. If you look at the timeline at the bottom, we're starting at 7 and going up to 12 noon, and plotting all the information that we had from his records. And then you can see along the bottom the times when he was prescribed certain drugs. It'll be a matter for the experts and clinicians to be able to discuss what the effects of the prescription of those drugs is likely to be, but that is the information graphically presented.

Can we see the next page? That's the temperature and central venous pressure. Can we go to the next

page? There you see it mapped out there. The pink or magenta is his central venous pressure, and you can see where it's -- well, this is from the information that we have. There was an issue as to how accurate it is, of course, but all that we've done here is to plot what it is. It'll be a matter for the oral hearing as to how much reliance one can place on it, and if you were placing reliance, what its significance would be. But just as a matter of what it does, you can see where it starts roughly, and you can see where it takes an absolute hike. That's roughly corresponding to round about 9.30. Then it starts to come down. And you can see the temperature as well. His temperature does appear to go up a little bit, although it flattens out.

THE CHAIRMAN: It's the CVP reading that Dr Taylor felt he couldn't trust?

MS ANYADIKE-DANES: That's it. That's exactly what it is.

THE CHAIRMAN: So he ignored them?

MS ANYADIKE-DANES: No, he didn't ignore them entirely. What he said was he was using them for benchmarks, so he was looking for relative change as opposed to absolute value.

If we look at the next page. This is an interesting one. These are the fluids. Solution No. 18, the human plasma factor, cells, Hartmann's, that's all "in". Then

we can look at "out": swabs, suction, towels, urine, and so forth. We haven't provided -- because it isn't provided in the records -- insensible losses. That is a calculation that the anaesthetist would make, just assess what he believed his insensible losses would be. But this is what's actually being measured.

Can we look at the next page? We tried to find a way of getting to grips with how to reflect the fluids going in and out. And so if you see that zero, Mr Chairman, everything above there is positive and everything below there is negative. Below the line is the losses and above the line is what's being administered, if you like. And it's not too difficult to see, there's an awful lot more going in than there is going out. The type of fluid is described there by different colours and you can see the key along the side. Therefore, that allows you to see where different types of fluids were administered.

THE CHAIRMAN: One of the key issues is the amount of Solution No. 18 administered in the first hour of the operation from 7 am.

MS ANYADIKE-DANES: That's exactly that. When I was reading that bit out from Dr Taylor's statement and when he was conceding about the amount, there you have it. Those two measurements, nothing was coming out at that stage.

Well, at least nothing was recorded as coming out at that stage. But that is what was going in. That is an issue that the experts and the clinicians are very alive to and is the core of a debate as to what is the significance of that: not just the type of fluid, not just how much fluid, but how quickly it was administered, the rate of administration.

Along that bottom, the negative side, some of those things are estimates in terms of -- you see there "urine". Right at the end, you have urine. That is actually the amount that was collected, but that's when it was collected then and nobody's entirely clear, but it's something we're going to investigate, as to what happened about his urine production over the course of that time. Certain estimates are made about it, there are certain views as to what was happening about his urine production, but given that it wasn't actually recorded, it's an issue and it's one that we've had the benefit -- or I will have the benefit of it when I've had time to consider it from Dr Coulthard, who has expressed the view just recently -- and for those who have read the transcript or listened to the DVD, they will know that he expressed the view at the experts' meeting on 9 March that it's possible that he didn't produce any urine at all during the period of his

surgery because the effect of the surgery may have been such that he just didn't produce any. That's a factor. It's not one that has yet entered the debate other than at that stage, but it's something that obviously we're going to have to pursue.

Next page, please. This is an important one. This is to try and get the cumulative balance of his fluid. If you pass on from the chart, it's much easier seen from that. This is the amount of fluid that is staying in his system, if I can put it that way. All we have done here is, as I say, record information and present it. There are a number of issues to do with how much did he already have in his system when he came in and so on. These charts can't help with that. That is a matter for the experts and the clinicians to address. But looking simply on what was administered and what was lost, you can see his hourly cumulative fluid balance and how it rises. So this graphically shows that although he did have losses, none of those losses were able to make any real impression on the amount of fluids that were being administered. There is also an issue as to what kinds of fluids in the sense of how much of that was free water and what is the significance of that. This has not gone into distinguishing free water from total fluids; this is just total fluids into his system.

THE CHAIRMAN: Okay. Shall we take a break at that point? We'll start again at 3.55 and when we come back at 3.55, we'll give an indication as to how late we can sit on this evening.

(3.40 pm)

(A short break)

(4.10 pm)

THE CHAIRMAN: Can I outline what's happening at my end and then ask the various interested parties their plans? The stenographer can do another session up to about 5.30, but not beyond. That will allow Ms Anyadike-Danes to progress her opening, but the reality is now that it will not finish this afternoon. But we should, over the next hour and 20 minutes, be able to provide you with a written copy of it so that you'll have that to take home with you this evening, as the interested parties, so that you can read back over what she has already said and what she will finish with tomorrow morning.

I know Mr McBrien, that you have already indicated you want to make an opening address tomorrow morning and that's still the case.

MR McBRIEN: It won't be that long. I don't think it'll be anything like an hour. I suspect it will be of similar duration to the one I made in the general nature.

THE CHAIRMAN: Thank you very much. For the trust,

Mr McAlinden? Is there anyone who will be making an opening address tomorrow morning after Mr McBrien on behalf of Adam's mother? Okay. That eases the pressure a little. I apologise again. Things haven't gone as smoothly at our end as I hoped and this will not be repeated in the future. So we'll sit today until coming up to 5.30, whenever there's a convenient break.

I think, at lunchtime, the additional reports from doctors Coulthard, Squier and Haynes were circulated; is that right? No? If anybody who hasn't received one would speak to Mrs Conlon today. I think most people seem to have got one and we'll catch up on anyone who hasn't. If we can then resume with Ms Anyadike-Danes.

MS ANYADIKE-DANES: Thank you.

Before I do resume, I'd just like to make one point. It relates to the comparative table of fluid calculations and assumptions made.

THE CHAIRMAN: Is that the table you were referring to just before the break?

MS ANYADIKE-DANES: No, it's the comparative table of the responses from Professor Gross, Coulthard, Haynes and Dr Taylor and Dr Savage.

THE CHAIRMAN: Okay. The parties will get this later. In your opening at what paragraph is that?

MS ANYADIKE-DANES: It is paragraph 140, but I wonder if

I can take you to reference 300-077-141.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: What I had said before was that this information came from the information that was provided to us by the various parties, so out of a table produced by Dr Haynes, Professor Gross, Dr Coulthard, Dr Sumner and so forth. But in relation to Dr Savage, we put the information that we had from him already into a table. We subsequently -- I think that might just have sort of fallen through the cracks to make sure that he had confirmed that it was accurate. But in any event, it was that information which went into a table in that way, which then has found its way, because we put it, into this compiled table.

THE CHAIRMAN: Is that under the heading "Inquiry WS"?

MS ANYADIKE-DANES: Yes, in terms of -- well, that's the -- if you look at his weight, for example, that's where we've got that weight in relation to Dr Savage. If you look at surface area, that's where we've got it. And if you look at "WS", that tells you the precise place we got it from and so on. So that's what those references are to. But having said that, we wanted to make sure that what we put into the table for him was accurate and we set out a table for his confirmation. What I had not appreciated is that when we had this compilation table,

that we had not, at that stage, received the confirmation from Dr Savage that what we had put in the table was accurate. In fact, what happened is that Dr Savage has produced his response, which was e-mailed to the inquiry on 21 March, and in that he does complete his table. There are differences between the table that he has completed and the information that is shown on this comparative table. That's the first thing to say. So obviously we will be amending that to reflect it.

The other thing to say is that this table is turning into a bit of a moveable document because the recent reports that we have received from the experts have indicated some shifting in their own calculations, leading to maybe different assumptions, I don't know. I haven't had an opportunity to consider their reports to see how this arises and what its importance is. It may not be terribly significant; on the other hand, it may be. But the end result of that is -- and those who have received the reports today will see it's Dr Coulthard who has gone in and made certain changes. It's not clear to me that the other experts have seen those, particularly if they relate to them, and seen whether they accept them or they don't. So there is a process to update this schedule, but its benefit, leaving aside what Dr Savage says about the representing of his

position, the benefit was it showed a particular period of time when people thought certain things about their calculations and assumptions being made.

If those things are changing, then that in and of itself is relevant because it goes to show that these things do, to some extent, not entirely, turn on judgment made on certain assumptions. So we will have to update this table. I regret the fact that Dr Savage may feel that he was included in this as if he had provided the completed table himself. So I hope that the correct position is now out there, and his table will be put into an updated version of this along with anybody else who wants to revise their figures. But this was the starting place.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: What I'm essentially doing is traversing the evidence that we have got under these various sections. So the next section to traverse in the sense of, "What have we got?", relates to Adam's death and the investigations that were made into it.

There were three photographs of Adam that were taken on 28 November, and a fourth photograph was taken just, as we understand it, after the life support was switched off. I'm not showing those photographs, obviously, although they are there in the papers.

The significance of them for this inquiry really is to enable the experts and others to factor Adam's appearance into their views on the extent to which he was, if I may put it this way, fluid overloaded at his death, notwithstanding the fact that he had received treatment since the surgery to try and address his hyponatraemia.

So if we start then with the report to the coroner and the autopsy as the first stage in the investigations into the cause. Adam's death was reported by Dr Savage to the coroner on 28 November. He stated, as you, sir, have mentioned, that the death was totally unexpected. On the instructions of the Coroner, a post-mortem was carried out on 29 November in the mortuary by Dr Armour.

At that stage, Dr Armour was a trainee forensic pathologist at senior registrar grade. One has to look at the meanings of that nomenclature because the word "trainee" sometimes has a rather pejorative sound to it if you're an experienced person. As we understand it, you are a trainee until you are a consultant and she wasn't a consultant, she was a senior registrar.

She was employed within the State Pathologist's Department, and worked, as we understand it, under the supervision -- and I use that word simply in its literal sense because she wasn't a consultant itself -- of

pathologists within the State Pathologist's Department. The consultant-grade pathologist took clinical responsibility for the autopsies they performed and the state pathologist, Jack Crane, had overall responsibility for ensuring that all cases were carried out appropriately and to a high standard.

Dr Armour had available to her ten files of medical notes and records and clinician's notes, and she refers to this in her communications with the Coroner. She summarised Adam's clinical history, particularly the fluids he received during the first 90 minutes of surgery and she noted that there was a blood loss of approximately 1200 ml by the end of surgery, that the blood gas result at 9.32 showed a serum sodium of 123 millimoles and a haematocrit of 18 per cent, and that his CVP during surgery rose to 30 and she not that had after surgery, he had a CT scan at 1.15, which showed gross cerebral oedema and a chest X-ray revealed pulmonary oedema with a CVP catheter tip in the neck vessel evident.

She then performed an external examination of Adam's body and Adam's weight. Let's just pull that up because there are some points there to look at. 011-010-037. There you see the needle puncture mark in the midline and the neck, needle puncture mark in the left side,

healed operation scar, 3 centimetres long on the left side, two further healed operation scars on the right. She generally describes his external appearance. And weight there, interestingly enough, is noted at 20 kilos, which was roughly his weight when he was admitted. The significance of that is something that we might pursue.

There is a diagrammatic representation of those details and we can pull that up at 300-090-189. There we are. Can we enlarge that a little bit? This actually is compiled from the report of Dr Simon Haynes. He has a diagram where, instead of these typed boxes, he has written them out, and that didn't seem to come up well on the screen, so we've typed them. So this is essentially his work in transcribing the description that Dr Armour provided in her report on autopsy.

So if you look at the neck, you can see that he has described those scars, healed scars, the puncture marks and so on. Leaving aside the bruising, you can see that he has described essentially what Mr Forsythe and Mr Rigg were matching up with his surgical procedures to see what could be learned about previous central lines. So these are the outward manifestations, they saw this, they were looking at his medical notes and records, and trying to understand exactly what he had experienced by

way of those things. From one point of view, to try and understand when the suture may or may not have been inserted and, from another point of view, to see to what extent the repeated use of central lines may have, in and of themselves, led to some sort of constriction.

So that's what Dr Armour was looking at. We don't have a photograph of it, but that's the translation into a diagram so far as we're guided.

She then commenced an internal examination and that has important features. That's at -- sorry, I should have mentioned that. When I mentioned his weight, she weighed him. What I should have said is when she describes him externally, she doesn't note any external appearance of swelling at all. I haven't shown those photographs, but they're there for people to see. She certainly hasn't noted anything.

So can we go to 011-010-038. This is the internal examination of the neck area. One point is the heart there, 120 grams. It was taken for transplantation, we understand, for the valves, but we are seeking guidance as to the significance, if any, of its weight. Then if you go down and you look at the native kidneys. There is a description there and, perhaps significantly, both ureters were hugely distended and dilated. Then the transplanted kidney was in situ in the right pelvis, the

ureter drained freely and the vascular attachments were intact.

I think we can go on to the next page. She weighed the various organs, the liver and the lungs. Interestingly enough, although she did that, you won't see on the report on autopsy any reference to the weight of the lungs. The brain on autopsy has to be fixed before it can be examined and the contemporaneous notes of her autopsy show that she recorded the unfixed weight of the brain initially at 1,302 grams, and that seems to have struck out and replaced by 1320. And then the lungs at 190 for left, I believe, 290 for the right. But none of those weights, the unfixed weight of the brain or the lungs, appear in the report on autopsy. She internally examined the neck and I think we can go to that, 011-010-039.

Right at the top:

"There was no evidence of congestion or obstruction of the major blood vessels or the carotid arteries and jugular veins. There was no evidence of superior vena cava obstruction. The carotid arteries were normal. There was a suture in situ on the left side of the neck at the junction of the internal jugular vein and the subclavian vein."

So there is an issue as to what exactly that means,

in particular the first sentence in relation to the third sentence.

Then if we go down and look at the description of the organs after fixation, and the external examination. Of course, she does that first. So she has the fixed weight of the brain as 1,680 grams and then weighs various parts. What she doesn't record there is what the unfixed weight was, although she's got that in her notes. And she describes the brain as.

"Grossly swollen with loss of sulci and uncal swelling and this was symmetrical."

She says:

"There was no uncal necrosis, there was swelling of the cerebellar tonsils, but no necrosis. There was no cortical venous thrombosis and the anatomy of the circle of Willis was normal."

Then she cuts and she notes that there was a massive brain swelling and constriction of ventricles.

"There was no ventricular haemorrhage. There was no asymmetrical lesion. There was severe white matter congestion and marked congestion of the blood vessels in the basal ganglia, white matter and deep grey matter. There was no necrosis of the mid-brain or brainstem."

Then she says that she's taken blocks from there and the brain was photographed sequentially. And we do have

those photographs. I don't propose to put them up now, but we have them and we have considered them, the inquiry's experts have considered them -- particularly the neuropathologist, Dr Squier and the neurologist, Professor Kirkham.

Then, under microscopy, she says, in relation to the lungs:

"There was congestion of the capillaries and moderate numbers of ovular macrophages and there was no evidence of embolism or infarction."

She examined the histological slides of the organ under a microscope and, in relation to the kidney, she records:

"Revealed complete infarction of the transplanted kidney."

And as I said before.

"Massive cerebral oedema of the cortex and white matter of the brain, but no evidence of terminal hypoxia."

In her commentary at the end of the report, Dr Armour referred to Arieff's 1992 article, the one that I have mentioned before, and she sought to distinguish it as referring to healthy children undergoing operations, minor operations like tonsillectomies, who therefore had normal functioning

kidneys, which was not the situation in this case. However she stated that:

"The most likely explanation for Adam's death was cerebral oedema, followed by a period of hyponatraemia and was compounded by impaired cerebral perfusion."

And she recorded the cause of Adam's death as:

"1(a) cerebral oedema due to 1(b) dilutional hyponatraemia and impaired cerebral perfusion during renal transplant."

She had available to her the opinion of Professor Jeremy Berry. He was professor of paediatric pathology as I indicated right at the beginning and he had the histological slides or at least some of them. He was engaged by the Coroner and the slides he was sent related to a number of parts of Adam's anatomy, but in particular his native kidneys and the donor kidney. And he concluded in his report that the transplanted kidney was dead, infarcted, and he thought that had happened at or before the time of transplantation.

Dr Armour claims to have also sought an opinion on the brain and related material from a Dr Mirakhur, who was a consultant neuropathologist, and she says that she sent the brain, spinal cord and histological slides and tissue blocks and claims that Dr Mirakhur's views in relation to the brain were consistent with her

report, that is Dr Armour's report on autopsy, in relation to that description and the comments that she made there on the brain.

However, the inquiry has sought a formal request or a new pathological report in respect of Dr Mirakhur and it seems that there was no such formal request and it seems that there was no such report provided by her. In fact, Dr Mirakhur denies any knowledge of her opinion having been sought or seeing any slides and she claims not to have seen the report on autopsy until the inquiry provided it when it was seeking a witness statement. So we have not really been able to advance matters as to Dr Mirakhur's views on the histological slides in relation to Adam's brain at that time.

In addition to that, there was a note made by the Coroner, and that's dated 8 December 1995. The note refers to Dr Armour also showing slides to Dr O'Hara -- no relation, as I think the chairman's mentioned last time -- Dr Denis O'Hara, who was a consultant paediatric pathologist, and a Dr Bharucha. We're not entirely sure which Dr Bharucha it is. There was a time when we thought it might be a Dr Chitra Bharucha, who is a haematologist, but that may not prove to be the case. In any event, we are pursuing the enquiry to find out which is the appropriate Dr Bharucha that is referred to

in the Coroner's note.

But whenever that happens, what the note records is that both of them, Dr O'Hara and the Dr Bharucha, stated that there was clear evidence of hypoxia. As I've just taken you through the relevant parts of the report on autopsy, Dr Armour concluded that there was no evidence of hypoxia. Unfortunately, Dr O'Hara is no longer available to us -- he is dead -- and we are trying to find where Dr Bharucha is in order to ask the question. But given that there is no reference to Dr O'Hara or Dr Bharucha in the report, there is no way of understanding how it came to be that the Coroner has referred to them taking that view and Dr Armour has concluded differently. She's entitled to conclude differently. All I'm explaining is that we don't know how that came about.

Dr Armour wrote to Professor Jack Crane, though, on 8 December. That was before she produced her report. She said that she had been dealing with the case of Adam and:

"I am willing to attend any meeting about this case, including a meeting of clinicians, administrative staff, HM Coroner and whoever else wishes to attend. As I was the pathologist who carried out the autopsy, I feel my opinion on the case is relevant to such a meeting and,

as such, the case could be discussed in full."

We don't actually know, at least so far as I'm aware, what prompted that letter. It was provided to a number of people, including Dr George Murnaghan, who's the hospital administrator; it was provided also to the coroner. It's not clear whether anyone at the State Pathologist's Department actually saw Dr Armour's report, which was subsequently produced after this, and before it was sent to the coroner, but we know that both Drs Savage and Taylor, at least from their own evidence, were present at some time while the autopsy was carried out.

The Coroner's papers also indicate that Dr Armour discussed Adam's death and its possible causes with doctors Taylor, O'Hara and Bharucha. As I say, this is what the Coroner's papers indicate. It's also clear from her subsequent evidence at the inquest that the extent of Adam's cerebral oedema was something with which she was quite unfamiliar.

The autopsy report is undated, so while it's known that a copy of it was sent out by the Coroner on 22 April 1996 to Adam's mother, the Coroner's experts Dr Sumner, Dr Alexander and to Dr George Murnaghan at the Royal, it's not entirely clear when Dr Armour finalised her autopsy report.

However, the way in which she carried out the autopsy and prepared her report is something that is going to be addressed in the oral hearing and will be also be considered from a governance perspective.

So moving to the Coroner's investigation because that was just the autopsy. The Coroner wrote to Dr Alexander. He was a consultant anaesthetist. The Coroner wrote to him on 30 November and asked him to prepare an anaesthetist's report on Adam's case for use at the inquest. And he stated that Dr Armour informed him that she found gross cerebral oedema, the worst she had ever seen in an autopsy on a child. And he identified the clinicians as Dr Taylor, Messrs Brown and Keane, and he stated that the child was healthy and considered to be an ideal candidate for transplant surgery, no complications were anticipated.

Dr Alexander confirmed that he would produce a report and the Coroner contacted George Murnaghan asking for statements from the clinicians involved as soon as possible. He also stated:

"It would be useful to have a statement from the technician responsible for the equipment in the theatre, confirming that it was functioning properly. The statement should cover the frequency of checks and whether such checks were carried out before and after

surgery in this instance."

Dr Armour contacted the Coroner on 1 December 1995 -- so that's quite soon after she had carried out her autopsy -- and indicated that she was becoming ever more convinced that there was a question mark over the anaesthetic equipment used, as nothing in the anaesthetic readings during surgery had indicated a problem. The Coroner spoke to Dr Murnaghan and asked that the equipment used during Adam's surgery should be independently examined.

Messrs Wilson and McLaughlin were the medical technical officers employed by the Children's Hospital. They carried out an inspection of the Siemens monitor on 2 December 1995. That's the monitor that had been purportedly used in Adam's surgery and they provided a report. They said that they were not told the purpose of their investigation. The inspection was carried out in the presence of Dr Fiona Gibson. As I've said before, she was consultant cardiac anaesthetist at the Children's Hospital, and she'd been asked by Dr Murnaghan and Dr Gaston -- if you remember, he's the clinical director of intensive care. She had been asked by them to review and report on the processes and equipment used in Adam's operating theatre. And Dr Taylor was present during the inspection.

The report that was provided to the Coroner as part of the inquest on Adam's death indicated that all cylinders were removed from the Lamtec and five pins were discovered to be loose and could be removed. The report further states:

"The anaesthetist using the machine is also expected to sign the log before commencing the list, but this does not happen on most occasions and a reason for this should be requested."

That particular part of the report is something that will be considered from a governance perspective.

Dr Gibson stated in her report, which she provided to Dr Murnaghan:

"The protocols for monitoring anaesthetic set-up and drug administration in this area are amongst the best on the Royal Hospital site."

The inquiry has since been advised that there aren't such protocols -- at least there weren't such protocols at the time and that Dr Gibson will have been referring to her perception of clinical practice in the Children's Hospital and not to any written document. That information is gained from letters dated 24 February of last year and 21 July of last year from DLS.

Quite how that could be the case is something that will be considered in the governance part or at least

from the governance perspective. But matters moved on. During enquiries by the PSNI in 2006, it turned out that they had all been inspecting and reviewing the wrong Siemens monitor. The correct one had been out for repair shortly after Adam's surgery and was on test in the department. In fact, that possibility that they might be looking at the "wrong" monitor -- I say "wrong" in inverted commas because they claim they didn't actually know why they were investigating the equipment. But the possibility that they weren't looking at the one that was used in Adam's case was actually raised in that report of Messrs Wilson and McLaughlin.

The conduct of the investigation of the equipment for the Coroner by them and Dr Gibson's review for Dr Murnaghan and Gaston are all matters that are going to be pursued from a governance perspective.

The Coroner met with Drs Murnaghan, Gaston and Lyons on 3 December and Dr Lyons suggested that it would be important to have another paediatric anaesthetist's opinion apart from Dr John Alexander because he didn't have extensive paediatric experience. And that might be relevant when one is considering his report.

The Coroner subsequently telephoned Dr Sumner, whose name you'll have seen throughout the papers, who agreed to provide an opinion for the inquest. And Professor

Jeremy Berry also agreed, at that stage, to provide a report on the transplanted kidney.

Dr Alexander's report was sent to the Coroner on 3 January and he claimed that there was very little available information concerning dilutional hyponatraemia in children. He referred to Arieff's paper, which was dealing with death or permanent brain damage in healthy children, and referring to how generally healthy children with symptomatic hyponatraemia had abruptly developed respiratory arrest and either die or suffer permanent brain damage. He summarised his opinion in this way:

"The complex metabolic and fluid requirements for this child having major surgery led to the administration of a large volume of hypotonics [that is number 18 solution] which produced a dilutional hyponatraemia and subsequent cerebral oedema."

That conclusion, at least how it's arrived at, that the complex metabolic and fluid requirements led to that, is something that is obviously a matter of debate amongst the experts, and indeed the other clinicians. Then he went on to say:

"Dr Taylor is to be commended on the detailed notes and records he kept throughout the anaesthetic."

THE CHAIRMAN: Just stop for a moment. You have referred to

Dr Alexander's report. He says the requirements led to the administration of a large volume of number 18, which produced dilutional hyponatraemia. Is he on his own in it? Dr Taylor has now moved away from that position, hasn't he, to the extent that he now says he administered a large volume of number 18 because of a miscalculation or a misunderstanding --

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: -- of what Adam's output could be?

MS ANYADIKE-DANES: Yes, he does say that.

THE CHAIRMAN: Now that Dr Taylor has changed his position, there's nobody that said, apart from Dr Alexander, that this large volume was required?

MS ANYADIKE-DANES: No, but in fairness to his position, one would want to find out more about how he arrived at that, why he thought that the complex metabolic and fluid requirements and major surgery led to that. That may be a fact. In other words, it's not that he necessarily thought that's how you approached it, but it may be that he thought that that had been the problem for Dr Taylor, that Adam was a complicated situation and he had been led into that error, if I can put it that way.

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: So we will have to look more as to what

he was actually saying therefore and to see whether he was expressing his own view that "I could have fallen into that error" or "That's how I think that error arose".

THE CHAIRMAN: It may be we don't need to follow Dr Alexander's line.

MS ANYADIKE-DANES: It may be that we don't need to, but these things are important as to what they thought at the time. What the state of knowledge was, what experienced consultant people, clinicians, could conclude was going on. Those things are important, and the question is, which is really sort of an education and training issue is: how could that be the case?

THE CHAIRMAN: Okay.

MS ANYADIKE-DANES: Dr Sumner produces his report on 22 January. So all these reports are really coming in, so far as we understand, before the report on autopsy. And he refers to Arieff's article, and he says:

"I believe that on the balance of probabilities, Adam's gross cerebral oedema was caused by the acute onset of hyponatraemia from the excess administration of fluids containing only very small amounts of sodium, dextrose, saline and plasma and this state was exacerbated by the blood loss and possibly by the overnight dialysis."

And if I pause there: there are issues about that that the experts are considering, as to whether that is indeed the case or might be the case. He then goes on to say:

"A further exacerbating cause may have been the obstruction to the venous drainage of the head. With drugs such as antibiotics which are administered through a venous line in a partially-obstructed neck vein, then it is possible that they could cause some cerebral damage as well."

So there's a lot going on in his report as to what he thinks might have contributed to it. And that's worth bearing in mind because, very often, the issue is telescoped down to a relatively simple proposition as to what he thought had happened. In fact, when one reads his conclusion, he has a number of hypotheses, and it's those hypotheses added to by the hypotheses of others that have made this, in recent weeks, quite a complex area.

THE CHAIRMAN: But he leads with dilutional hyponatraemia with other exacerbating factors?

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: Which is in, very broad terms, the decision of all of the experts save for Dr Kirkham, who thinks it's other factors that take the lead?

MS ANYADIKE-DANES: Well, those would be extremely broad terms because there are real differences amongst the experts as to the extent to which they felt that the overnight dialysis was relevant at all, and could even have been an exacerbating factor. There is a real difference amongst the experts as to whether they believe that there was any obstruction of venous drainage of the head and, if there was, whether it was caused or could have been caused by the suture that Dr Armour identified in her report on autopsy. And then it's not clear at all what people think about the effect of having drugs being administered through a venous line.

So if you say in broad terms that they agree that dilutional hyponatraemia was a main factor, then one would say yes, but the trouble is that not all of them have such a straightforward line. There are all these issues as to whether any of that was exacerbated, whether it needed anything else to produce that terminal event and so forth. And that is precisely the area of debate where the experts are at the moment and the only reason for reading this out is to show you that that had started as far back as 1996, ie the fact that there wasn't just one factor, even so far as Dr Sumner was concerned.

And of course, if an expert talks about an exacerbation of a condition through blood loss, that becomes an issue, and that's a very important issue to see whether that did happen, could happen, and what does that mean about our procedure. And just on the straightforward learning, what do we do about that? So these things are actually quite important, these alternative or additional hypotheses or elements to the hypothesis. Certainly the overnight dialysis is also an important question.

Professor Berry sends a letter to the Coroner, dated 25 March, and he encloses his report, and he says:

"I am unable to throw any light on the cause of this child's death. I suspect the answer lies in the precise details of his clinical management and the examination of his brain. I doubt this kidney would ever have functioned."

It's very interesting that he refers to the examination of the brain because it's the examination of the brain that we don't have at that time anyway, didn't have a full report on, and so one's trying to do it now from a remove, as it were.

He then goes on to say in his report that he noted:

"On microscopy [the transplant of the kidney, that is] the kidney shows also complete infarction, and that

the transplant kidney was infarcted [these are his words] dead. The extent of the change suggested that this occurred at or before the time of transplantation."

Which I think was reflected in Dr Armour's report.

So if we move now to the inquest itself, Adam's inquest was opened on 18 June, evidence was heard. Amongst others, Dr Sumner, Dr Alexander, Dr Patrick Keane, and I understand Professor Berry wasn't called because he had expressed himself as being unable to throw any light on the cause of the child's death.

It was adjourned to 21 June when the evidence was heard from Dr Taylor and Dr Savage, and the only relevance of saying that is that it means that Dr Sumner didn't hear Dr Taylor's evidence at the inquest, or for that matter Dr Savage, but principally didn't hear Dr Taylor's evidence.

Of the team that were involved in Adam's transplant, the rest of the team -- Dr Montague, Mr Brown, Peter Shaw -- or any of the nurses, none of them were called so far as I understand it, to give evidence at the inquest. And the Coroner didn't have available to him the expertise of a paediatric neurologist.

Dr Armour in her evidence to the coroner was that she found massive cerebral oedema and she said that she had never

come across anything of similar degree. She also stated that Adam had experienced substantial blood loss. And that issue about whether he did or he didn't -- and I've already identified the views of Mr Keane on that point and why he has those views. That is obviously an issue because people are attributing the blood loss in part or at least are considering it as a potential contributory factor. So he had experienced substantial blood loss and that he was a sick little boy. She further stated that:

"There was impaired cerebral perfusion as there was a suture on the left side and a catheter tip on the right."

And this is a new matter that was not in her report. In her autopsy, she said that the suture had been there for some time. That's going to be an issue.

Dr Alexander said in his evidence that there was a fluid deficit between 5 am and 7 am, and that he would not have been particularly alarmed with the drop to 123 millimoles, and he did not entirely concur with Dr Sumner's concern that a compromised renal function is not a factor in the onset of hyponatraemia.

One has to look at his report carefully to see what he means about the fluid deficit between 5 and 7 because in some ways of looking at it, there was because he

didn't have any fluids. But as I was explaining before, and as the experts do discuss, clinicians -- it rather makes a difference what the starting point is. So it's not just as simple as saying whether anyone has any fluids or experiences any losses between a given point in time. It rather depends, as I understand it, on what their position is before you enter that period of no fluid.

So Dr Sumner, in his evidence, stated -- and this is also an interesting point because he develops that issue of the venous drainage:

"Without the venous drainage problem, Adam may have survived, provided the level did not drop below 123 millimoles. Fluid balance in paediatrics is a very controversial area with a variety of views."

But his first point is an interesting one of note: he was of the view that so long as you didn't get that serum sodium level below 123, he could have survived without that venous drainage problem, and that means it is important to find out exactly what was happening about the suggested venous drainage problem by Dr Armour.

As I say, when he gave evidence, he didn't have an opportunity to hear and comment upon Dr Taylor and Dr Savage.

THE CHAIRMAN: An expert witness coming to give evidence could see the statements of the doctors who were involved in the treatment of the dead child, wouldn't he?

MS ANYADIKE-DANES: I don't know whether he actually saw them.

THE CHAIRMAN: Well, he should have seen them.

MS ANYADIKE-DANES: I'm not suggesting that they wouldn't have been made available to him; I'm just not sure whether he saw them. In answer to your question, I don't know. We can look and see what was made available because we will be able to look at the Coroner's files and see where they were sent and that's something that we will do. But as I stand here, I can't tell you whether he saw them or not.

What Dr Taylor says is that he spoke to Dr Sumner and Dr Savage at a lunch break in the Coroner's inquest and explained that Adam had high-output renal failure and so could not respond by ADH, by concentrating urine and retaining water. And the ADH is the antidiuretic hormone. He had earlier made that very plain in a PSNI statement under caution on 17 October. This is what he said:

"They both acknowledge that the cause of the papers on dilutional hyponatraemia couldn't have happened to

Adam; yet, in court, they said it did."

And he was frustrated that they said in court that it could happen in that way. Unfortunately, Dr Sumner is not available to us, but it's an issue to be pursued so far as it can be as to what exactly Dr Taylor meant by that conversation that he says he had.

In any event, the cause of Adam's death was recorded on the verdict on inquest and you've seen it before: cerebral oedema due to dilutional hyponatraemia, impaired cerebral perfusion during renal transplant, operation for chronic renal failure. So in essence, the Coroner has accepted the other factors that were referred to by Dr Armour and developed by Dr Sumner in his report. And in fact, if you look at page 10 of Dr Sumner's report, what he says is:

"The acute onset of hyponatraemia from excess fluids containing very small amounts sodium exacerbated by blood loss and possibly also exacerbated by overnight dialysis and obstruction of the venous drainage to the head."

That coroner's verdict was not accepted by Dr Taylor and he disagreed with -- at least, at that stage, he disagreed with Dr Sumner's principal finding. What he said was:

"I cannot understand why a fluid regime employed

successfully with Adam previously, led on this occasion, to dilutional hyponatraemia. I believe that the underlying cause of the cerebral oedema was hyponatraemia -- not dilutional -- during the renal transplant operation. Adam was the only child with polyuric renal failure I have anaesthetised for renal transplant. He needed a greater amount of fluid because of the nature of the operation. I believe the fluids given were neither restrictive nor excessive. The new kidney did not work, leading to a re-assessment of the fluids given. This made us think that we had underestimated the fluid."

And he gave a bolus at 9.32.

It's important to note that what is recorded there is Dr Sumner's responses in his deposition and Dr Taylor's responses to questions during the inquest. And you don't have the benefit of the questions, you simply have his answers. So one has to interpret that with care and a particular area to be careful about is the last two sentences where he says:

"The new kidney did not work, leading to a re-assessment of fluids given. This made us think we had underestimated fluid and we gave a fluid bolus at 9.32."

It's easy to run those things together and believe

that the effect of him looking at the condition or the lack of performance of the kidney was to lead him to increase the fluids. If that were true, that connection would actually be quite important, but we have questioned Dr Taylor about that in terms of witness statement requests and his evidence to us in the statements is that those two sentences should not and cannot properly be linked together; they were simply answers to questions and that statement is available for people to consider. I just say that, and that's a point to consider when one reads all the depositions and the evidence to the coroner: recognising that you're only getting the answers, not the questions.

So Dr Taylor set out his objections to Dr Sumner's report and Dr Armour's autopsy in correspondence, and we can see that in 2 February 1996 and 8 May 1996 and he was fairly trenchant over quite a period of time as to his differences with them and why.

The verdict on inquest, it's fair to say, is not entirely accepted by the inquiry's experts, and the reasons for that have been addressed in their debate and will be reflected, I trust, in their reports. When I say that, it is not that they are considering whether they accept the verdict on inquest. They're not thinking about the inquest in that way; they are looking

at the causes and linkages and seeing whether they agree with them. So the implications of the views that they are expressing is that, for some of them, they don't accept the verdict on inquest in relation to the dilutional hyponatraemia. I think they all accept it was cerebral oedema. It's the "B" that causes the problem. The dilutional hyponatraemia causes a problem for some, the impaired cerebral perfusion causes a problem for others.

Moving then to the PSNI investigation carried out. I don't want to go any more into that because I have already drawn from it in terms of statements that people made. The principal large statement looked at is the transcript of the interview under caution of Dr Taylor. It is a very lengthy document and it bears some scrutiny, Mr Chairman, particularly in the light of the statement that Dr Taylor submitted on 1 February of this year.

As you know, Mr Chairman, the revised terms of reference, although they were revised, hadn't really affected Adam in any way because the things that this inquiry has to investigate in relation to him were there from the outset and they have remained unchanged throughout. The list of issues for Adam -- one thing I could say, actually, although they haven't changed for

Adam, I think it's the case that the fact that Claire's death has been added to the investigation and that her death is so proximate to both -- well, in terms of her death being proximate to Adam's, there's almost a year's difference, but there's something like four or five months' difference between her death and the inquest into Adam, and that proximity is something that we are looking at very carefully in relation to governance. So it has had an impact in that case, but from the clinical point of view it hasn't had an impact on what we're looking at for Adam.

So then if we look at the list of issues or consider the list of issues. As you know, Mr Chairman, they were published on 14 February 2012. And in relation to the clinical area, which is what this hearing is going to be about, there are really four areas that they fall into. One is the investigation into the relevance of the care and treatment that Adam Strain received at the Children's Hospital. Another is investigating into the care and treatment that he received on specific days, the 26th, 27th and 28th, in relation to the management of his fluid and electrolyte balance, and then there's an investigation into the quality of information that was provided to and received from the next of kin and from when the possibility of placing Adam on the renal

transplant list arose in 1994 until the announcement of the inquiry in 2004.

Then finally, there is an area to be investigated into the experience of the transplant team, including the surgeons, anaesthetists and nurses. So the list of issues, of course, is in great detail. I'm simply trying to put them into four main categories, but all those issues we are looking at, of course.

That moves me exactly on to issues to be addressed through the oral hearing. All the evidence, as I said before, that's received by the inquiry, the categories of which I've already described, form part of the material for you, Mr Chairman, on which you in due course make your findings. And as I've taken you through it, I think it can be seen that it is a substantial volume of material and, as one might expect, not all of it is consistent; there are also gaps in the information. In some places, it seems clear that those gaps cannot be filled. For example, the inquiry has been informed by the DLS that they no longer have a complete set of staff rotas. So if there is an issue that relates to that, well, they don't have them. After being told that, I believe we have had some documents, but in a piecemeal fashion, and I think the reality of it is that they don't have a comprehensive or complete

set of them.

Now, we are going to seek to have a witness address the policy on destruction of documents, but that's an issue that we will more conveniently deal with from a hospital management and governance point of view, and it's unlikely that it's going to assist us in any event in learning better what actually happened in relation to Adam, but it is an issue from the governance perspective.

Some gaps may be filled by evidence. For example -- and I gave you the example before when we were looking at the chronology -- it's unclear whether the chest X-ray that Dr O'Neill has recorded in Adam's notes as having been ordered was actually carried out. We just don't know that. What we know is we don't have it, but we don't know whether it was actually carried out and, if it was carried out, whether anyone ever saw it, so where there are references to "chest clear", what that means.

If it wasn't actually carried out, then we don't know why not, and that's something that we hope can be clarified and that gap filled for you during the oral hearing. If it can't and it's all left unsatisfactory, then I suspect it's going to be part of a governance issue or a hospital management issue.

In addition to providing missing elements of the narrative, if I can put it that way, the matters to be addressed during the oral hearing are essentially going to concern four categories of as yet unresolved issues, dealing with the differences between the documents and the evidence of a witness, the evidence of witnesses, whether between the accounts that they themselves have given, some witnesses' evidence is internally inconsistent, if I can put it that way, or between the accounts of one witness and another.

The evidence of a witness and the views of an expert, where those differ, those are issues to be explored. And then the views of the experts themselves on a particular issue, especially where those experts' views diverge, and particularly where they diverge on something that is considered to be an important question.

Those categories of as yet unresolved issues apply to the entire period that is relevant to Adam's case, but they particularly apply from 14 July 1994, when the arrangements were made to put Adam on call for renal transplant simultaneous with the start of dialysis, up until the autopsy on 29 November 1995. And for the purposes of this opening, what I would wish to do is to highlight the main issues leading up to that report on

autopsy in relation to four periods, if I can put it that way. One is the preoperative period, and that spans quite a large period. That is a period from he when was put on the register right up until the morning of his transplant surgery, so it takes into account that important period of the evening of his admission on 26 November.

Then there's the perioperative period, which deals with the period from the start of anaesthesia for his surgery until his transfer to paediatric intensive care, so that's roughly seven in the morning of the 27th to noon, roughly.

The post-operative period -- and that deals with the period from Adam's transfer to paediatric intensive care up until his death and then the period following his death, which deals with the autopsy until the verdict on inquest. So those are the four periods. And the events that took place in those periods are to a certain extent reflected in some of the documents that have been compiled by the legal team, and I will refer to them when it's appropriate to do so. But in particular, as you'll have already seen, there is the timeline of the main events and the schedule of surgical procedures, the charts on serum sodium levels and urine sodium levels, all in relation to the entirety of the period. Then we

have the chronology of events that you've seen from the 26th to 29th. Then we have his pre-surgical state from the time of his admission to 7 am, and then the charts of the perioperative period covering that 7 to 12, and what was being measured and what could have been understood from what was happening to Adam during that period.

Now, I have to say I'm anxious not to compromise the evidence that's going to be given during the oral hearing, particularly where there's an issue concerning differences in the versions of those who were directly involved with Adam's case or queries over some part of his management over that period of the 26th to 28th. So I'm going to try and address those issues with care and sometimes I may not address them at all, simply to try and preserve the best evidence for you.

But an example that I can give without compromising matters concerns the differences and inconsistencies in the evidence of Dr Taylor, and I have already touched on that, and in particular the explanations that he gives in his interview under caution on 17 October in relation to his preparation for Adam's transplant surgery and his management of Adam during it.

The PSNI have provided the inquiry with a transcript of that interview, and that's part of the papers and

everybody has access to it. As I said before, it really is a very lengthy document. But it is worth looking at, notwithstanding -- well, maybe because of Dr Taylor's most recent inquiry witness statement on 1 February, which was welcome, but nonetheless, when he says and acknowledges a number of errors that led to a lower standard of care for Adam than he would normally give, it gives rise to issues as to exactly the basis for the explanations he was given, what he understood could and was happening to Adam by comparison to what he now says was the case, and those two things are worth comparing.

There are also issues other than matters arising out of Dr Taylor's evidence, especially in relation to his most recent witness statement, that relate to governance, and that will be looked at there.

The reports of the experts that were engaged in previous investigations into Adam's case, whether by the Coroner for the purpose of the inquest or by the PSNI, they've all been published. And furthermore, the reports received to date from the experts engaged by the inquiry have been provided to the interested parties and will in due course be published. And you can see, Mr Chairman, that there are clear differences between the experts and Adam's clinicians in some respects and there are also clear differences amongst the experts

themselves, not just the inquiry's experts but the experts previously engaged and the inquiry's experts and I'm going to try and highlight some of those differences for you. There is a very important area of disagreement between the experts that is worth especially mentioning.

THE CHAIRMAN: Shall we save that special mention for tomorrow?

MS ANYADIKE-DANES: Yes.

THE CHAIRMAN: I've been looking around and I'm conscious of the fact that you've been on your feet from 11.30 and everybody's been following it from the screens from 11.30 and there's a limit to how much detail can be absorbed. I now know from the response when we came back in shortly after 4 o'clock that when you finish, Mr McBrien's going to speak tomorrow morning. There will be other opening addresses so we should be able to get your opening finished comfortably tomorrow morning and Mr McBrien, and also sort out some other bits and pieces of business because I think there are other bits and pieces to be tidied up. So unless anyone has any objections, we'll stop now for the day.

We will resume tomorrow morning at 10 o'clock, I promise. If you would hold on for a few minutes, I understand that the script from which Ms Anyadike-Danes is working is going to be available in the next few

minutes. It's probably helpful for you to see overnight what she has been referring to, what she will say tomorrow, and also that gives you a chance to look at the additional reports which were circulated at lunchtime. So unless there is anything that has to be dealt with immediately, that brings us to a conclusion today. Thank you for your patience. Thank you very much indeed.

(5.20 pm)

(The hearing adjourned until 10.00 am the following day)

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