Witness Statement Ref. No.	279/1

NAME OF CHILD: RAYCHEL FERGUSON (LUCY CRAWFORD)

Name: R.J. MURRAY QUINN

Title: DR.

Present position and institution:

Retired.

Previous position and institution:
[As at the time of the child's death]

Consultant Paediatrician initially employed by the Western Health and Social Services Board and then subsequently by the Altnagelvin Area Hospitals HSS Trust from January 1978 to early August 2006 (Retired August 2006).

Examiner for the Royal College of Paediatrics and Child Health (for three years following retirement).

Membership of Advisory Panels and Committees:
[Identify by date and title all of those between January 2000 – August 2012]

- Medical Staff Committee (Altnagelvin Hospital 1978 - Retirement)
- Paediatric Cancer Subgroup (2003/2004 approximately)
- Confidential Enquiry into Stillbirths and Deaths of Infants Neonatal Adviser (1980 - Retirement))
- Committee reviewing Services for Adolescent Services for patients, Altnagelvin Hospital (approximately 2004-2006)

Previous Statements, Depositions and Reports:
[Identify by date and title all those made in relation to the child's death]

OFFICIAL USE:
List of previous statements, depositions and reports attached:

Ref:	Date:	

IMPORTANT INSTRUCTIONS FOR ANSWERING:

Please attach additional sheets if more space is required. Please identify clearly any document to which you refer or rely upon for your answer. If the document has an Inquiry reference number, e.g. Ref: 049-001-001 which is 'Chart No.1 Old Notes', then please provide that number.

If the document does not have an Inquiry reference number, then please provide a copy of the document attached

I. Questions in Relation to your Career Background and Training

(1) Please address the following questions with regard to your qualifications, experience and occupation/post as of April 2000:

(a) State your medical and professional qualifications, and the date on which they were obtained.

MB BCh BAO Queen's University, Belfast, June 1970
D.Ch. Glasgow December 1972
MRCP (UK) June 1973

(b) State the date of your appointment to the post of Consultant Paediatrician in the Altnagelvin Hospital.

I was appointed to this post on 1st January 1978.

(c) List all of the professional posts held by you before and since the date of your appointment as Consultant Paediatrician at Altnagelvin Hospital, and provide the dates of each such appointment and its duration.

- Junior House Officer, Royal Victoria Hospital (August 1970 - July 1971)
- Senior House Officer, Medicine, Royal Victoria Hospital (August 1971 - July 1972)
- Senior House Officer, Paediatrics, Royal Hospital for Sick Children, Glasgow, (August 1972 - January 1973)
- Senior House Officer, Geriatrics, Belfast City Hospital (February 1973 - July 1973)
- Paediatric Registrar, Royal Belfast Hospital for Sick Children (August 1973 - July 1974)
- Senior Registrar/Senior Tutor, Royal Belfast Hospital for Sick Children (August 1974 - July 1975)
- Senior Registrar, Paediatrics, King Edward VIII Hospital, Durban (August 1975 - July 1977)
- Senior Registrar, Paediatrics, Ulster Hospital Dundonald (August 1977 - December 1977)

(2) At any time prior to your involvement in providing a report to the Sperrin Lakeland Trust in Lucy's case, had you received any form of advice, training or education in order to inform you of the appropriate approach to fluid management in paediatric cases and if so please state,

(a) **Who provided this advice, training or education to you?**

I was taught as a Student (pre-graduation) about fluid management. This would have been mostly during a living-in period in the paediatric wards of the Royal Belfast Hospital for Sick Children ('RBHSC') in 1969. The advice would have been from the doctors working in the Paediatric Wards at that time and mostly in ward rounds/tutorials.

As a junior doctor there was advice from more senior doctors and through my own reading about the subject in textbooks such as Nelson and Forfar & Arneil amongst others (these are standard paediatric reference texts).

Issues covered were the type and volumes of fluid to use in specific circumstances, for example, for dehydration or diabetic ketoacidosis. I read articles on fluid management and made charts of volumes to use for different weights of child for my personal day to day use.

(b) **When was it provided?**

Please see my answer to Question 2 (a) above.

(c) **What form did it take?**

Please see my answer to Question 2(a) above.

(d) **Generally, what information were you given or what issues were covered?**

Please see my answer to 2 (a) above.

(3) **At any time prior to your involvement in providing a report to the Sperrin Lakeland Trust in Lucy's case, had you received any form of advice, training or education in order to inform you of the issues relating to hyponatraemia in paediatric cases and if so please state,**

(a) **Who provided this advice, training or education to you?**

As a medical student living in the Paediatric Wards in 1969 in RBHSC, I was taught about the dangers of using hypotonic solutions specifically in hypernatraemic dehydration (high serum sodium associated with dehydration and inappropriately high sodium content of milk feeds).

As a junior doctor I took advice from more senior doctors.

As part of my Continuing Professional Development, when a Consultant, I read textbooks and articles regarding the dangers of the use of hypotonic solutions. This included reading about inappropriate antidiuretic hormone, as being associated with specific medical conditions such as in sick children with pneumonia, septicaemia and meningitis. It was thought to be an inconsistent association.

I can recall reading this material in the late 1980s and in the 1990s (I cannot recall the specific articles. I have been unable to find any photocopies of such articles which I took at the time, as a lot of material was discarded when I retired in 2006).

(b) **When was it provided?**

Please see my answer to Question 3 (a) above.

(c) **What form did it take?**

Please see my answer to Question 3(a) above.

(d) **Generally, what information were you given or what issues were covered?**

Please see my answer to Question 3(a) above.

(4) **Prior to April 2000, describe in detail your experience of dealing with children with hyponatraemia, including the**

(a) **Estimated total number of such cases, together with the dates and where they took place.**

Over more than three decades I saw a number of children with hyponatraemia. I find it hard to estimate the numbers as they would have been scattered over that period of time. Many would have had conditions such as gastroenteritis and would have been losing electrolytes, including sodium, from their vomiting and diarrhoea. Neonates who were requiring dextrose solution to maintain their blood sugars also became hyponatraemic. I have seen very ill patients admitted already showing low sodium, presumably from inappropriate ADH secretion.

I am unaware of any of my patients who died as a result of hyponatraemia.

(b) **Nature of your involvement.**

Please see my answer to Question 4(a) above.

(c) **Outcome for the children.**

Please see my answer to Question 4(a) above.

(5) **Since April 2000, describe in detail your experience of dealing with children with hyponatraemia, including the**

(a) **Estimated total number of such cases, together with the dates and where they took place.**

I cannot give an estimation of the number of children that I would have seen with hyponatraemia since April 2000. (The guidelines for the use of dilute intravenous solutions changed in our hospital and in the rest of Northern Ireland in 2002).

(b) **Nature of your involvement.**

Please see my answer to Question 5(a) above.

(c) **Outcome for the children.**

Please see my answer to Question 5(a) above.

II. Questions Arising out of your Statement to the PSNI on the 11 March 2005 [Ref: 115-041-001-004]

(6) *"In the days following the death of Lucy Crawford, I was contacted by telephone by Mr. Hugh Mills, Chief Executive of the Sperrin Lakeland Trust to ask if I was willing to review the Hospital notes of the child and comment on certain aspects of the case. In the first instance I agreed only to look at the notes and consider whether I would be in a position to agree to discuss them."* **[Ref: 115-041-001]**

(a) As of April 2000 did you know any of the following persons:

(i) Mr. Mills;

I knew Mr Mills from when he had worked in an administrative post at the Altnagelvin Hospital and to a lesser extent through the Prehen Sailing Club.

(ii) Mr. Fee;

I had no previous contact or knowledge of Mr Fee.

(iii) Dr. Kelly;

I would have known Dr Kelly as a member of the Area Medical Staff Committee but, had not had any social contact with him. To the best of my recollection the Area Medical Staff Committee met approximately once a year.

(iv) Dr. Anderson;

I may have met Dr Anderson at social functions during the period when I worked in Durban, South Africa, between the years 1975 to 1977.

(v) Dr. Jarlath O'Donohoe;

I had met Dr O'Donohoe at Paediatric meetings occasionally, particularly of the Ulster Paediatric Society. I had no social contact with Dr O'Donohoe.

(vi) Dr. A. Malik;

I had no previous contact or knowledge of Dr Malik.

(vii) Dr. Auterson

I had no previous contact or knowledge of Dr Auterson.

(b) If you knew any of the above named persons, please state:

(i) The capacity in which you knew them;

Please see my answers to Question 6 (a) above.

(ii) The nature of your relationship with them;

Please see my answers to Question 6 (a) above.

(iii) Whether you disclosed your knowledge/relationship with any of these persons to the Sperrin Lakeland Trust?

I did not disclose the above information to Sperrin Lakeland Trust.

(c) Had you heard of the death of Lucy Crawford before being contacted by Mr. Mills? If so, please outline how you had become aware of her death and what you knew about it?

I may have heard of Lucy Crawford's death but, I do not believe this was by direct contact with anyone from the Sperrin Lakeland HSS Trust.

(d) What did Mr. Mills tell you about Lucy's death and the circumstances of the death?

As far as I remember, Mr Mills said that Lucy had died following treatment in the Erne Hospital and subsequent transfer to the RBHSC Paediatric Intensive Care Unit (PICU).

(e) Did Mr. Mills explain to you the nature of the process which the Trust was engaging in, which would involve you in reviewing Lucy's notes and providing comments? If so, what did he say?

As far as I remember, Mr Mills said that the Trust were carrying out an internal inquiry into the circumstances of Lucy Crawford's admission and treatment.

(f) In any event, what was your understanding of the process which the Trust was engaging in?

Please see my answer to Question 5(e) above.

(g) Did Mr. Mills explain to you why he felt a review of Lucy's Hospital notes and a comment on certain aspects of the case was necessary? If so, what did he say?

I have no clear memory of what Mr Mills stated in this respect.

(h) Did Mr. Mills explain why he had identified you, in particular, to review the Hospital notes and provide comments? If so, what did he say?

I have no memory of Mr Mills discussing this with me.

(i) Did Mr. Mills outline any concerns to you in relation to Lucy's death or how she had been treated in the Erne Hospital? If so, please outline the nature of the concerns that he shared with you.

I cannot remember the specific details of this part of my conversation with Mr Mills.

(j) Did Mr. Mills explain the purpose of the review which he was asking you to conduct? If so, what did he say?

I believe that Mr Mills explained that this was for the purposes of an internal Trust review.

(k) **Did Mr. Mills explain to you how he intended to use any review or comments provided by you in relation to Lucy's treatment and death? If so, what did he say?**

Not that I remember, beyond that it was to be used for the purposes of an internal Trust review.

(l) **Did Mr. Mills identify for you (during the telephone conversation) the particular aspects of the case which he wanted you to comment on? If so, what did he say?**

As far as I remember, Mr Mills identified that he wanted a general review of Lucy's treatment.

(m) **Did you and Mr. Mills discuss the process which the Trust would be following in order to examine the death of Lucy? If so, what was discussed?**

I do not believe there was any discussion about the process which the Trust would be following in order to examine the death of Lucy.

(n) **In the course of your career had you ever received a request for assistance similar to that which Mr. Mills was making to you? If so, please outline the type of circumstances in which such requests have been made of you.**

I had not previously been asked to assist in an internal review process by a Trust, although we frequently discussed cases at the Perinatal meeting at Altnagelvin Hospital.

(o) **Why did you respond to Mr. Mills by agreeing to look at the notes to consider whether you would be in a position to discuss them, rather than immediately signalling your agreement to assist?**

I wished to see what information was available and the details recorded in notes and decide if I could usefully help with possible questions to be posed by the Trust. I also wished to outline the limitations on my involvement which were that:

1. I would perform a Case note review only.
2. I was not willing to talk to the mother/parents of Lucy.
3. I would not question the Nursing Staff involved in her care.
4. I would not question the Medical Staff involved in her care.
5. I would not act as a Medical Adviser in any formal complaints procedure.
6. I would not provide a Medical Legal report.
7. I was willing to discuss the case with representatives of the Trust.

(p) **Did you maintain a record of your discussions with Mr. Mills? If so, please provide the Inquiry with a copy of this record. If you did not retain a copy please explain when and why you disposed of it.**

I made no written recording of my conversation with Mr Mills.

(7) *"I was supplied with photocopies of the child's Erne Hospital notes and records on 21 April 2000 and was asked for my opinion on: (1) the significance of the type and volume of fluid administered; (2) the likely cause of the cerebral oedema; (3) the likely cause of the changes in the electrolyte balance, in other words was it likely to be caused by the type of fluids, the volume of fluids used,*

the diarrhoea or other factors. I reviewed the notes and records and made a handwritten summary of them and questions that occurred to me as I was reading the records." **[Ref: 115-041-001 & -002]**

(a) **Please confirm that you received your instructions from Mr. E. Fee (Director of Acute Hospital Services, Erne Hospital) in a letter dated 21 April 2000 [Ref: 033-102-296]?**

I confirm that I received my instructions in this letter from Mr Fee.

(b) **Please confirm that when you received your instructions from Mr. Fee you received photocopies of all of the notes and records which are to be found within File 27.**

I received a photocopy of notes and records from Mr Fee. The photocopy that I received did not, however, contain a copy of all the pages containing in File 27. The pages that I did not receive were as follows:

- 027-001-001
- 027-001-002 (as this page is redacted I am unable to confirm whether I had received a copy of this page)
- 027-002-003 to 027-002-012 (inclusive)
- 027-007-017
- 027-011-027
- 027-011-029
- 027-011-030
- 027-012-042
- 027-016-046
- 027-016-047
- 027-016-051
- 027-016-052
- 027-016-054
- 027-017-064
- 027-020-065
- 027-023-071 to 072 (as these pages are redacted I am unable to confirm whether I was supplied with them at the time)
- 027-026-078
- 027-026-079 and
- 027-027-080

(c) **Please outline your experience (as of April 2000) in the clinical setting of dealing with issues of the type that had been raised with you for the purposes of your opinion.**

I had been a Consultant Paediatrician since 1978 which would have involved significant experience in dealing with all aspects of paediatric medicine.

(d) **Did you consider yourself qualified to provide an opinion on the specific matters which were raised with you by Mr. Fee? If so, outline why you considered yourself to be qualified to provide this opinion?**

I did consider myself qualified to discuss specific paediatric clinical matters. I was qualified in this respect, on the basis of my long clinical experience and knowledge.

(e) **After receiving Mr. Fee's letter and before contacting Mr. Mills to discuss what you were prepared to do, did you have a discussion with any other person in relation to the circumstances of Lucy's death or the task that you had been asked to perform? If so, who did you have that discussion with and what was discussed?**

I did not discuss this matter with anyone else.

(f) **If you have retained the handwritten summary of the notes and records and questions which occurred to you, please provide a copy to the Inquiry. If you have not retained a copy please explain when and why you disposed of it.**

I have appended a copy of the handwritten notes that I made of the questions that occurred to me as I reviewed the notes.

(g) **What questions occurred to you as you read the records?**

The questions and points that occurred to me are set out on the appended sheets. By way of summary, however, these were:

- What symptoms and signs were noted by the GP and for how long and what treatment had been given.
- Findings on admission to hospital.
- Was Lucy noted to look ill
- Possible diagnosis.
- Investigations - results and possible reasons for them.
- Initial treatment.
- What fluids had been given, both orally and by IV and was a prescription written.
- Subsequent treatment and sequence of events.
- Description of episode and collapse/fit at 3am.
- Efficiency of treatment of this event and resuscitation.
- Amount of NaCl 0.9% given.
- Why was there respiratory arrest?
- The investigations around the time of the collapse.
- Was Mannitol given?
- Why was there such rapid deterioration in Lucy's condition?
- Other evidence of fluid overload.

(h) **Did you address these questions to anyone at the Trust? If so, identify the person you addressed the questions to, and the responses which you received.**

These questions were addressed during discussions with Dr J Kelly and Mr E Fee.

(8) *"I then telephoned Mr. Hugh Mills and said that whilst I would review the records and discuss them with representatives of the Trust, I was not willing to become involved in preparing a report for a complaints procedure, nor in preparing a report for medical/legal purposes. I made it clear to him that I would not interview the doctors involved, the nurses or the family and that if I accepted the papers it was only with a view to reviewing the records and discussing the issues*

which occurred to me as I read them. My recollection of events is that I recommended that they obtained an opinion from a Consultant Paediatrician from outside the Western Board for such purposes." **[Ref: 115-041-002]**

(a) On what date did you telephone Mr. Mills?

I cannot recollect the exact date on which I telephoned Mr Mills.

(b) Did you make a written record of your conversation with Mr. Mills? If so, please provide a copy of that record to the Inquiry. If you did not retain a copy please explain when and why you disposed of it.

I did not make a written record of my conversation with Mr Mills.

(c) Please fully explain why you were not willing to take any of the following steps:

I did not wish to be involved in any of the anticipated possible consequences of the death of a child, such as outlined above. I was willing only to try and help with a case note review and discussions with representatives of the Trust.

(i) Prepare a report for a complaints procedure;

Please see my answer to Question (8)(c) above.

(ii) Prepare a report for medical/legal purposes;

Please see my answer to Question (8)(c) above.

(iii) Interview the doctors involved;

Please see my answer to Question (8)(c) above.

(iv) Interview the nurses;

Please see my answer to Question (8)(c) above.

(v) Interview the family.

Please see my answer to Question (8)(c) above.

(d) Please explain why you were only prepared to review the records and to discuss the issues which occurred to you as you read them?

Please see my answer to Question 8(c) above.

(e) Did you at any time set out in writing for the Trust the constraints around your involvement in the review, which are summarized at (c) and (d) above?

I did not set out the constraints of my involvement in writing.

(f) **Why did you not set out the constraints around your involvement in the review within the written report which you subsequently provided to the Trust?**

I had stated and made clear what I was willing to do to all three of the individuals with whom I had contact (Mr Mills, Dr Kelly and Mr Fee). My understanding, therefore, was that the persons who were receiving my report were all aware of the constraints applicable to its preparation. In the event that I had been aware at that the time that the report may be circulated, or used by anyone else, then I accept it would have been prudent to have set out the constraints within the written report. (Please see 115-056-007 and 116-043-014 where Dr Kelly makes reference to this discussion during his Police Interview and 116-032-003 when Mr Fee also makes reference to this discussion).

(g) **State precisely how you envisaged carrying out the review in light of the constraints which you described to Mr. Mills (as described at (c) and (d) above).**

By a case note review and oral discussion with representatives of the Trust, namely Dr Kelly and Mr Fee.

(h) **Did Mr. Hugh Mills say anything to you in response to the constraints which you outlined for him in terms of how you would conduct the review? If so, what did he say?**

As far as I can remember, Mr Mills agreed to proceed with my opinion under the constraints discussed.

(i) **When did you recommend that the Trust should obtain an opinion from a Consultant Paediatrician from outside of the Western Board Area, and who did you make that recommendation to?**

As far as I can remember, this recommendation was made to Mr Mills by telephone. To the best of my recollection I had two telephone calls with Mr Mills and I believe that the recommendation with regard to obtaining a Consultant Paediatrician from outside the Western Board Area was made during the second call. I am unable, however, to recollect the dates of either of those telephone calls.

(j) **Why did you make that recommendation?**

I made the recommendation because I foresaw that there could be a complaint brought against the Trust and possible legal proceedings in the future, because a child had died. I had made it clear that I would not be willing to act in either capacity. As there were a limited number of people who would have been in a position to report, I recommended that Mr Mills consider looking outside the Western Board area.

(k) **When you made this recommendation what, from your perspective, would have been the purpose of the Trust obtaining an opinion from a Consultant Paediatrician from outside of the Western Board Area in circumstances where you had agreed to review the records?**

My review of the records was to help with the Trust's internal review and not beyond that. As stated above, I anticipated that there may be further matters arising, such as a formal complaint or medico-legal proceedings, which would have required the Trust to obtain a further report given the constraints that I had already outlined to the Trust.

(l) **Did you make that recommendation orally or in writing?**

I made the recommendation orally to Mr Mills.

(m) **Did any representative of the Hospital/Trust respond to your recommendation? If so, what was said to you by way of response?**

I understand that at a later date the doctor whose name I had mentioned, Dr Jenkins, Consultant Paediatrician, prepared a report for the Trust. I do not know whether this was as a result of my suggestion or, was coincidental.

(9) *"In June 2000 Dr. J. Kelly, Medical Director and Mr. Eugene Fee, Director of Clinical Services at the Erne Hospital came to my office to discuss my review of the notes and records. We had a full discussion of the notes and records and I recollect advising both Dr. Kelly and Mr. Fee that I could not be sure, based on the limited information available to me, of the cause of the cerebral oedema in this case. There can be a number of causes of cerebral oedema. It was not possible to provide a conclusive opinion from the information contained within the notes and records. We did discuss the issue of fluid administration and I recollect pointing out, particularly to Mr. Fee, that he needed to ascertain from staff involved in the care of the child the exact volumes of fluid given from admission to the possible 'fit' before 3.00am and also during the subsequent resuscitation. I pointed out that there had been no prescription written for the fluids and that after 3.00am it appeared that normal saline had been allowed to 'run freely' intravenously. Nowhere in the notes is it stated that the child gave the appearance of being 'shocked' which would have required another fluid regime."* **[Ref: 115-041-002]**

(a) **Please confirm that the meeting you are referring to occurred on the 21 June 2000.**

That is correct.

(b) **What was the purpose of the meeting?**

The purpose of this meeting was for discussion of the case and for me to answer questions and indeed ask questions, for example, about the exact amount of fluids given before the collapse at 3am and during and after the resuscitation.

(c) **Prior to the meeting which took place in June 2000, had you sought or obtained from the Trust any other information/clarification or documentation in addition to the notes and records which had been provided to you on 21 April 2000? If so, please describe the information/clarification or documentation which you sought or obtained from the Trust.**

I did not request any other information, clarification or documentation prior to the meeting on 21st June 2000.

(d) **Please examine a record of the 21 June meeting which has been produced by the Sperrin Lakeland Trust contained at [Ref: 036a-047-101]. To the best of your recollection does the content of this document adequately summarize what was discussed at the meeting? If you disagree with the content of this document in any respect, please explain your disagreement.**

The document at 036a-047-101 appears, to the best of my recollection, to be an accurate summary of what was discussed, save for the following points:

- I note that this document states that Lucy's urea was 9.0. In fact from the clinical records the urea was 9.9. I am unable to recollect whether a reference was mistakenly made to a urea of 9.0 during the meeting or, whether, this was misrecorded.
- The document states *"Dr Quinn does not feel that the extra fluids caused the brain problem."* I do not consider that this is an accurate summary of my views, which was that I did not consider the amount of fluid that was recorded as having been administered before 3am, was sufficient to cause such a degree of cerebral oedema as to lead to coning.
- The document refers to 250mls of saline being administered after the resuscitation. I have no recollection of being informed of this figure.
- Based on a recent review of the documents I note that the fluid had been chosen by the Paediatric Senior House Officer and not the Anaesthetist as stated in this document.
- I do not have a clear recollection of seeing the Post Mortem report at this meeting. Given the note I believe I may have seen the Post Mortem or discussed its contents at this stage. I have, however, since seen a number of versions of the Post Mortem report and do not know which, if any, version was shown to me at this meeting.

(e) If you agree that the content of the record of the meeting produced by Sperrin Lakeland Trust is accurate, please consider the following entry and address the questions arising:

"Dr. Quinn notes that there was further fluids administered after the resuscitation - 250 mls N-Saline. Again choice of fluid by anaesthetist was reasonable but volume high. Could after an hypoxic event this have produced the cerebral oedema. Events remain unclear." **[Ref: 036a-047-101]**

(i) On what basis or by reference to what document did you conclude that 250 mls of normal saline was administered after the resuscitation?

I have no recollection of concluding 250mls of normal saline was administered after the resuscitation or mentioning this. No such volume is recorded in the copy of the notes that I received.

(ii) On what basis or by reference to what document did you conclude that these fluids had been chosen by the anaesthetist?

I do not recollect concluding or stating that the fluids had been chosen by the anaesthetist. My understanding, based on the notes, would have been that the suggestion to use 500mls of Normal Saline was written in the medical notes on 13th April 2000 by the Paediatric Senior House Officer (whom I believe may have been Dr Malik).

(iii) Who raised the query about whether these fluids could have produced the cerebral oedema?

I think it is most likely that I did.

(iv) Were any steps taken to further address this query, and if so please outline the steps that were taken?

I said to Mr Fee and Dr Kelly that it should be clarified how much fluid was given, for example, that they check with the local nursing or medical staff.

(f) **At the meeting did Mr. Fee or Dr. Kelly outline to you any particular concerns that they had in relation to the treatment of Lucy? If so, what did they say?**

I have no clear recollection of this.

(g) **Did you discuss with Dr. Kelly and Mr. Fee the possible causes of cerebral oedema? If so, what was discussed?**

I did discuss the possible causes of cerebral oedema. As I recall this included:

1. The use of N/5 saline (0.18%) and the volume given.
2. The possibility of hypoxia - at the time of the fit/collapse.
3. The possible large volume of N saline given (0.9%).
4. The efficiency of the resuscitation.
5. The possible apnoea, and therefore hypoxia, as a result of the rectal diazepam.

(h) **Please explain why it was not possible to provide a conclusive opinion on the cause of the cerebral oedema from the information contained within the notes and records?**

The description of the suspected fit, as recorded in the chart, is not sufficiently detailed to form an opinion as to whether Lucy had a tonic clonic (classical epileptic) fit or, whether the symptoms were those of coning due to cerebral swelling. These are two very different events.

(i) **Did you explain to Dr. Kelly and Mr. Fee why it was not possible to provide a conclusive opinion on the cause of the cerebral oedema from the information contained within the notes and records?**

As far as I can remember, I discussed this with Dr Kelly and Mr Fee in the terms outlined in answer to Question 9(h) above.

(j) **Did you reach any view on the further information which you would have required in order to provide a conclusive opinion on the cause of the cerebral oedema? If so, did you explain your view to Dr. Kelly and Mr. Fee?**

Please see my answers to Questions 9(e)(iv).

(k) **If you were unable to reach a <u>conclusive</u> opinion on the cause of the cerebral oedema, were you nevertheless able to identify a number of <u>possible</u> causes of the cerebral oedema in Lucy's case? If so, what views did you reach and did you explain them to Dr. Kelly and Mr. Fee?**

Please see my answer to Questions 9 (g) and (h) above.

(l) **Please explain why it was necessary for Mr. Fee to ascertain from staff involved in Lucy's care, the exact volumes of fluid given from admission to the time of the possible 'fit', and during the subsequent resuscitation?**

I considered this information was required as if more N/5 Saline had been given than recorded it could have explained the rapid deterioration of Lucy's condition.

Also, if all of the 500mls of the Normal Saline had been given over a short period of time (at 3am) there could have been acute cardiovascular complications (right heart failure) and it could have contributed to the cerebral oedema.

(m) Did you advise Dr. Kelly or Mr. Fee in relation to the reasons why it was necessary to ascertain the exact volumes of fluids given to Lucy? If so, what did you say?

Please see the answer to Question 9(l) above.

(n) When did you tell Mr. Fee of the importance of ascertaining the exact volumes of fluids which had been given to Lucy? Was it during the meeting in June 2000 or at some other point?

I believe this was during the meeting that I had with Mr Fee and Dr Kelly on 21st June 2000, as far as I can remember.

(o) How did Mr. Fee respond to your advice that it was necessary for him to ascertain from staff involved in Lucy's care the exact volumes of fluid she had been given?

Mr Fee may have said that he already checked with the Nursing Staff but would do so again.

(p) Before completing your written report had you received from Mr. Fee (or anyone else associated with the Trust) clarification of the exact volumes of fluids which had been given to Lucy?

No.

(q) If you had not received clarification of the exact volume of fluids which had been given to Lucy, on what basis were you able to write a report which expressed the view that you would have been surprised if the volume of fluids could have produced cerebral oedema?

The volumes referred to in my report are those of the fluids as recorded in the chart (namely, 150mls total orally; 50mls of juice and 100mls of electrolyte solution) plus the 400mls total of N/5 saline, run at 100mls per hour for four hours as in the chart. I felt this total volume (550mls) given over the recorded period of time should not have been sufficient to provide such a degree of cerebral oedema that Lucy coned and had irreversible brain damage.

(r) If you had not received clarification of the exact volumes of fluids which had been given to Lucy before completing your written report, what reference, if any, did you make to this issue in your written report? ? If you did not make reference to this issue, please explain your omission to do so?

My written report was a summary of some what we discussed and was meant to be used in conjunction with the oral discussion I had had with Dr Kelly and Mr Fee.

(s) Why did you point out to Dr. Kelly and Mr. Fee that it appeared that normal saline had been allowed to 'run freely'? In particular, what was the significance of this fact?

Intravenous fluid administration should be in a controlled fashion with the stated rate per hour calculated and written on the fluid prescription chart. The volume of N Saline set up was recorded as 500mls and stated by Sr McManus in the Nursing Records to be *"run freely into the IV line"*. This is not in keeping with the above good practice. I calculated Lucy's total blood volume, based on her weight, to be approximately 720mls, (9 kilograms x 80mls/kilogram). The volume of 500mls as already stated run into a total blood volume of 720mls is very excessive.

(t) **By the time of your meeting in June 2000 had you reached any view on the possible implications of allowing normal saline to 'run freely' in the circumstances of Lucy's case? If so, did you explain those possible implications to Dr. Kelly or Mr. Fee?**

Yes, please see my handwritten notes at the time.

(u) **Did you explain to Dr. Kelly and Mr. Fee that the notes did not state that Lucy gave the appearance of being shocked?**

I do not recall stating this.

(10) *"We also discussed inappropriate anti-diuretic hormone secretion which can occur in some sick children causing abnormal water retention."* **[Ref: 115-041-002]**

(a) **Please outline the nature of the discussion which took place in relation to inappropriate anti-diuretic hormone ('ADH') secretion?**

I cannot remember the exact words used in the discussion but, at the time, I was aware of inappropriate ADH and its result (namely excessive water retention) in children with particular conditions (pneumonia, septicaemia and meningitis).

(b) **Explain the views that you expressed about ADH and its relevance to the circumstances of Lucy's case?**

My recollection is that I said it could have played a role in the decline of her serum sodium level.

(c) **Having discussed ADH at the meeting with Mr. Fee and Dr. Kelly, what reference, if any, did you make to this issue in your written report? If you did not make reference to this issue, please explain your omission to do so?**

I made no reference to ADH in the report as my report. My report did not cover all of the aspects discussed at the meeting.

(11) *"At the conclusion of my meeting with Dr. Kelly and Mr. Fee I was asked to summarize on paper what we had talked about. The case note I prepared is not a medical/legal report. It is a summary of my review of the case notes and records together with some of the questions which occurred to me when I was reviewing the records."* **[Ref: 115-041-002]**

(a) **Why did you agree to summarize on paper what you had talked to Mr. Fee and Dr. Kelly about?**

Dr Kelly said he needed something in writing to take to their internal review. I said I was not willing to do a full medical legal report, but was persuaded to provide a summary for the above purpose only.

(b) Did the paper which you provided to the Trust constitute a medical report on Lucy Crawford?

The paper I provided was a summary of some of what we discussed at the meeting on 21st June 2000 to be used at the Trust's internal inquiry. The format used in the summary is not the one that I used when I was preparing a formal medico-legal report for the use of solicitors, barristers or Trust use, for example, in a formal complaints procedure.

(c) Would you draw a distinction between a medical report and a medical legal report? If so, what is that distinction?

I would not draw any distinction between the terms medical report and medical legal report. What I was seeking to convey by the above comment was that, the document I produced for the Trust was intended to be a summary of the issues that I had discussed on 21st June 2000, as opposed to a stand-alone report.

(d) How did you intend the report which you provided to the Trust would be used?

I intended the report to be used only as part of the Trust's internal review, in addition to the discussion that I had with Dr Kelly and Mr Fee.

(e) Did you tell the Trust how you believed your report should be used? If so, what did you say?

I told Mr Mills that I was not writing a full medical legal report on this case and also at the time of my discussions I told Dr Kelly and Mr Fee this (Please see 115-006-007, 116-043-014 and 116-032-003 for Dr Kelly's and Mr Fee's recollections of this point).

(f) Did the Trust tell you how your report would be used? If so, what did they say?

I recall that they agreed that it was to be used as part of their internal review.

(12) *"I neither asked for, nor received, a fee for my review."* **[Ref: 115-041-003]**

(a) Why did you not ask for a fee for the work carried out by you in the review?

I did not ask a fee for work because of the limited nature of what I had agreed to do and the fact that I was not providing a full medico-legal report.

(b) Were you offered a fee for the review? If so, who offered you a fee?

I was not offered a fee for the review.

(13) *"At the end of my meeting with Dr. Kelly and Mr. Fee I was asked to provide a written summary of our discussion and in this way I was "sweet talked" into writing the case note summary, rather than limiting my involvement to a verbal discussion of the records."* **[Ref: 115-041-003]**

(a) **Why did you allow yourself to be *"sweet talked"* in the manner described?**

Dr Kelly said he needed to bring something in writing to their internal review and eventually I reluctantly agreed to produce a summary of some of what we discussed.

(b) **Who *"sweet talked"* you into writing the case note summary?**

Dr Kelly persuaded me to write the summary.

(c) **What words were used in order to *"sweet talk"* you into providing what you have called "a written summary of our discussion"?**

I recall Dr Kelly saying that I had done the work so why not write a report. I do not recall any other part of the conversation other than my insistence that I was not writing a full medical legal report. (Please see 115-056-007 and 116-043-014 and 116-032-003).

(d) **When you provided your *"written summary"* to the Trust why did you give it the following title: *"Medical Report on Lucy Crawford"* [Ref: 033-102-270]?**

The written summary that I provided to the Trust was typed by my secretary and it may be that she inserted this heading. I do not recollect noticing that it was entitled Medical Report at the time I sent it out.

(14) ***"Detective Sergeant Cross has asked me if I had been provided with a copy of Lucy Crawford's post mortem report. No I wasn't"*** **[Ref: 115-041-004]**

(a) **Please refer to the Trust's record of the meeting set out [036a-047-101] where it states,**

"Reviewing the PM report Dr. Quinn feels it does not help us piece together why this child died"

and clarify whether in your view this represents an accurate record and what you understand by it?

I have difficulty remembering exactly when and where I was informed about the Post Mortem results. I know that in the Erne Hospital notes there is a note by Dr O'Donohoe dated 18th April 2000 at 9.10pm, which records a verbal report of the Post Mortem via PICU at the Royal Victoria Hospital which notes rota gastroenteritis and cerebral oedema. I have noted this in my handwritten summary of the chart.

I was either verbally told of the pathologist's report at the time of my discussion with Mr Fee and Dr Kelly or may have been given sight of a version of the Post Mortem Report. I do not believe that I was ever given a copy of the Postmortem to keep, as had I been, this would have been filed with the other material in relation to this case and I do not have a copy of this Postmortem report.

As detailed above, I am now aware that there are various versions of the Post Mortem Report and I do not know which version may have been discussed or seen by me at this meeting.

(b) **If you weren't provided with a copy of the post mortem report, were you appraised of the pathologist's findings, or given an opportunity to read the report?**

Please see my answer to Question 14 (a) above.

(c) **If so, what conclusions did you reach in relation to the post mortem report?**

As stated above, I am not sure which version of the Post Mortem report I was told about or given sight of. One suggests the pneumonia had a large part to play in Lucy's death and noted cerebral changes consistent with an hypoxic episode. Another version seems to put more weight on the cerebral oedema as the more significant finding.

(15) *"Given the circumstances of Lucy's death, I felt from my experience that the Coroner would have been involved."* **[Ref: 115-041-004]**

(a) **What particular factors associated with the circumstances of Lucy's treatment and death caused you to feel that the Coroner would have been involved?**

The fact that Lucy had been given an excessive amount of fluids; had an episode of collapse; was transferred to PICU and died within a short period of time.

(b) **Did the Sperrin Lakeland Trust give you any information in relation to the involvement of the Coroner? If so, who spoke to you about this and what were you told?**

It was my understanding that the Coroner had been informed about the death by those dealing with her at the time of her death namely the PICU staff in RBHSC. I cannot remember where I received this information from.

(c) **Did you at any time advise the Trust that the Coroner should be involved in the case? If so, who did you provide this advice to and what was their response? If you did not provide this advice, please explain why you didn't.**

As stated above, I understood the Coroner had been informed about the death. It was normal practice for the Coroner to be notified about a death by the medical staff involved in the treatment of the child at the time when she died. In Lucy's case that was the PICU staff at the RBHSC. I did not, therefore, feel I had any role in informing the Coroner's Office.

(16) **In your statement to the PSNI you did not refer to a telephone discussion with Mr. Fee which would appear to have taken place on the 2 May 2000. Please confirm that you took part in a telephone discussion with Mr. Fee in relation to Lucy Crawford on that date.**

If you did take part in such a discussion please address the following issues:

(a) **What was the purpose of this discussion?**

I have no recollection of a telephone conversation with Mr Fee on the 2nd May 2000 and am not, therefore, able to answer this question.

(b) **Please examine a record of this discussion made by Mr. Fee at [Ref: 033-102-287]. To the best of your recollection does this record adequately summarize what was discussed at that time? If you disagree with the content of this document in any respect, please explain your disagreement.**

As I am unable to recollect this telephone conversation, I am unable to state whether the record made by Mr Fee is accurate.

(c) **During this discussion did Mr. Fee outline to you any particular concerns that the Trust had in relation to the treatment of Lucy? If so, what did he say?**

I am unable to answer this question as I have no recollection of this telephone call.

(d) **Did you make any request for further information or clarifications during this discussion? If so what did you ask for and was it provided?**

I am unable to answer this question as I have no recollection of this telephone call.

III. **Questions Arising out of the Medical Report on Lucy Crawford [Ref: 033-102-270]**

(17) *"I have reviewed the notes of this child as requested and will make a short summary and some comments on the possible sequence of events in this case."* **[Ref: 033-102-270]**

(a) **Apart from the clinical notes and records relating to Lucy, did you take any other information/documentation into account when you wrote your report?**

I based my summary only on the copies of the clinical notes.

(b) **For the avoidance of doubt, please consider the documentation listed in the Appendix of the Review of Lucy Crawford's Case [Ref: 033-102-269] and clarify whether you received any of those documents from the Trust?**

I have reviewed the document at 033-102-269. The only document listed which I received was Item 21, the letter from Mr Fee to me dated 21st June 2000.

(c) **If you did not receive any of the statements or reports which had been provided to the Trust by the nurses and clinicians who had been involved in Lucy's care, please explain why you did not ask Mr. Fee or Dr. Kelly to obtain such material?**

I did not receive any statements or reports of the medical or nursing staff. My summary is solely based on the copies of the clinical notes and the subsequent discussion with Mr Fee and Dr Kelly. The reason I did not ask for such material is that my agreement with Mr Mills was that I would do a case note review only.

(18) *"An intravenous line was inserted at 23.00 hours by a Consultant Paediatrician and solution 18 was started. It would appear that this continued at a rate of 100mls/hour over the next 4 hours. The child also drank 150 mls prior to this."* **[Ref: 033-102-270]**

(a) **Please explain how you established that the intravenous line was inserted at 23:00 hours and solution 18 started at that time? Please refer to the note or record which you used to inform your conclusion.**

It is recorded in the medical notes dated 12th April 2000 at approximately 23.00 "IV line inserted" (027-010-022). This appears to be in Dr O'Donohoe's writing. This was the basis on which I took 23.00 hours as the time the Solution 18 was started.

(b) **Did you give consideration to whether the intravenous fluids were started at 22:30 as documented at [Ref: 027-017-058]? If so, what consideration did you give to this issue and what conclusions did you reach?**

I cannot recollect precisely what I considered at the time when I was preparing my notes. My handwritten notes use the 23.00 hours as the time of the IV line insertion by Dr O'Donohoe and the commencement of the Number 18 Solution at 100mls per hour.

(c) **Did you give consideration to the time at which the infusion of solution 18 was stopped? If so, what consideration did you give to this issue and what conclusions did you reach? Please refer to the note or record which you used to inform your conclusion.**

I cannot remember precisely what I gave consideration to at the time but I note that the Nursing notes record 03.15 as the time that the IV fluids were changed to N saline (027-017-057).

(19) *"On reviewing the child's electrolytes in and around that time it was decided that because the sodium was low that normal saline should be given. At 03:20 hours it was noted the respiratory effort was decreased. An airway was inserted and the child was bagged with bag and mask. She was ultimately intubated by an Anaesthetist and Flumazenil, 100mcg was given. Her pupils were noted to be fixed and dilated. She was transferred to the intensive care unit in the Erne Hospital and ventilated...."* **[Ref: 033-102-271]**

(a) **Please explain how you were able to establish from the notes and records that it was in response to a review of the child's electrolytes showing that the sodium was low that a decision was made to give normal saline?**

I made a presumption that the change to N saline was made on the basis of the previous administration of the Solution 18 at 100mls per hour for four hours and the electrolyte results. There is no time record for this electrolyte urea result (on the lab form).

(b) **Did you reach a conclusion in relation to the time at which those treating Lucy reviewed her electrolytes and found her sodium to be low? If so, please explain the conclusion which you reached and identify the review of the electrolytes to which you have referred.**

I cannot recollect reaching a conclusion as to the time at which those treating Lucy reviewed her electrolytes and found her sodium to be low. I would have, however, noted that there was a reference to the urea and electrolyte result in the medical notes (027-010-023) and that the Fluid Chart refers to N Saline being administered from 3.00am (027-019-062).

(c) **Did you reach a conclusion in relation to the time at which those treating Lucy decided to give her normal saline and for how long it was given? If so, please explain the conclusion which you reached and refer to the note or record which you used to inform your conclusion.**

The Nursing notes record 03.15 as the time that the IV fluids were changed to N saline (027-017-057).

I cannot find anywhere where it was recorded how much Normal saline was given nor over what period, apart from the note which appears to have been made by Dr Malik on 13th April 2000 at 03.20 which states that NaCl 0.9% 500mls should be given over 60 minutes (027-010-

024). This seems to be a suggestion that this amount should be given rather than recording that this was the volume actually given.

(d) **Did you reach a conclusion in relation to the time at which Lucy's pupils were first noted to be fixed and dilated? If so, please explain the conclusion which you reached and refer to the note or record which you used to inform your conclusion.**

Please see the note which appears to be written by Dr Malik on the 13th April 2000 at 03.20, pupils fixed and non-responding to light. Fixed dilated pupils indicate serious brain damage at that time. This most often is irreversible.

(e) **What conclusions did you draw from the fact that Lucy's pupils were found to be fixed and dilated? Did you inform Dr. Kelly or Mr. Fee of those conclusions?**

I concluded Lucy had suffered irreversible brain damage at that time. I have no recollection of discussion of the fixed dilation of the pupils with Dr Kelly and Mr Fee.

(20) *"I have subsequently been made aware that the Pathologist reported that the child had a significant pneumonia and cerebral oedema."* **[Ref: 033-102-270]**

(a) **How were you advised of the Pathologist's findings?**

I cannot recollect whether I was verbally informed of the Pathologist's findings or had sight of a version of the Post Mortem Report.

(b) **When were you advised of the Pathologist's findings?**

Based on the notes of the meeting on 21st June 2000 it appears that this happened at the time of the meeting with Dr Kelly and Mr Fee.

(c) **What significance, if any, did you attach to the Pathologist's findings when completing your written report for the Trust?**

Both the pneumonia and cerebral oedema were taken into consideration when I completed my written report for the Trust.

(21) *"I suspect she may have been quite ill on admission."* **[Ref: 033-102-271]**

(a) **What did you intend to convey by the phrase *"quite ill"*?**

One of the most significant statements an experienced Clinician can make in relation to the assessment of a patient is whether they consider them to look ill or not. On a personal basis this is one of the things I recorded in the notes following an examination of the patient. It is something which comes with experience. By use of the phrase quite ill, I intended to convey that Lucy may have been more ill than was apparent at first assessment on her admission to Erne Hospital.

(b) **Outline all of the factors which led you to suspect that Lucy was "quite ill" on admission, and refer to the particular notes and records which informed your view on this.**

Lucy's mother or parents felt that Lucy was ill enough to be seen by the GP. The GP letter describes Lucy as being drowsy and lethargic, floppy, with pyrexia and not drinking. All of these indicate a sick child and the GP considered her ill enough to refer her to hospital for admission and had stated *"needs fluids"*.

The hospital notes record that Lucy had not been feeding as usual for five days. She was running a fever, vomiting everything and had for the past twelve hours been very sleepy. Investigations were requested and it was felt she required IV fluids. Her blood urea was raised and she had a raised white cell count predominantly neutrophils, which suggests a possible bacterial infection. She had ketones in her urine indicating that she had been taking insufficient carbohydrates, that is, not eating, vomiting and starting to use her fat supplies as an energy source. She was pyrexic, had a raised heart rate and a respiratory rate. All of these factors lead me to think this was quite a sick child.

(c) **Did you reach a conclusion in relation to whether the illness which Lucy was suffering on admission to Hospital was implicated in her deterioration and death? If so, please explain the conclusion which you reached and fully explain the basis for it.**

Looking at the signs and symptoms on admission and the pathologist's findings of which I was made aware, I felt that Lucy may have had a significant pneumonia on admission. She was not treated initially with antibiotics which may be significant.

(22) *"I think the urea measurement of 9.9 on admission does indicate a degree of dehydration."* **[Ref: 033-102-271]**

(a) **Please outline the steps, if any, which you took to determine the degree of dehydration?**

I read the GP and hospital notes to see if any of the signs and symptoms of dehydration were noted. The GP stated *"mucosa moist"* in the referral letter (027-004-014). Normally the mucosa would be dry even with mild dehydration. There is no mention of mucosal state in the hospital notes. There is no assessment of skin turgor, nor as to whether the eyes were sunken. Tachycardia and tachypnoea are recorded. The capillary refill time is recorded as being more than two seconds. This does suggest a degree of dehydration, however, my personal practice is to say precisely what the capillary refill time actually is, for example three seconds or four seconds, as I feel that is a more meaningful indicator of the child's condition, the slower the capillary refill time the more significance one can attach to it. The only recorded significant pointers to dehydration recorded are the history of vomiting, not drinking, drowsiness, increased heart rate and respiratory rate and a laboratory finding of a raised urea. There was no blood pressure measurement recorded in the doctor's notes, nor admission notes before the episode of collapse/fit. In other words there is limited recording of staff specifically looking for signs of dehydration for the purposes of assessing its severity.

(b) **Explain why you were unable to reach a conclusive view of the extent of the dehydration?**

Please see my answer to Question 22 (a) above.

(23) *"Fluids*
She was treated with Solution 18 which would be appropriate. On looking at the volume of fluids over the 7 hour period between admission and 3.00am when she had the possible seizure she got a total of 550 mls. This would include 150 mls oral and 400 mls i.v. as the intravenous drip was running at 100mls/hr over a 4 hour period. Calculating the amounts over that period of

time this would be about 80mls/hr. I have calculated the rate of fluid requirements. If she was not dehydrated she would have required 45mls/hr. If she was 5% dehydrated it would have worked out at 60mls/hr and 10% dehydration works out at 80mls/hr. I would therefore be surprised if those volumes of fluid could have produced gross cerebral oedema causing coning. I have however noted that there was no prescription written for the fluids indicating the volume per hour that should be given." **[Ref: 033-102-271 & -272]**

(a) **Did you reach any conclusions in relation to the purpose that was being served by administering solution 18 at a rate of 100 mls/hr? If so, please explain the conclusions which you reached and fully explain the basis for them.**

Dr O'Donohoe in his note of 14th April 2000 states that he had intended to give 100mls of fluid over one hour and then 30mls per hour thereafter of 0.18% NaCl 4% dextrose. It appeared to me that this instruction had not been communicated to the staff dealing with Lucy and indeed I noted there were no written instructions as to what fluids were to be given in the fluid chart, nor in the medical notes when the IV fluids were commenced. The conclusion I came to was that more IV fluids were administered than had been intended.

(b) **Why did you reach the view that it was "appropriate" to treat Lucy with solution 18? Please fully explain your answer.**

My perception was that the doctors admitting the child assessed her as requiring maintenance fluids and at that time (2000) the commonest maintenance fluid used extensively was Solution 18 so it was appropriate that they used that type of fluid at the time.

If a child appeared shocked, the common practice would have been use 0.9%NaCl, however, it did not appear to me, from the notes, that they assessed that Lucy was shocked from hypovalaemia (reduced blood volume due to fluid loss).

(c) **Did you reach any conclusions in relation to the appropriateness of the rate of infusion (100 ml/hr) and the volume of fluid which was given to treat Lucy? If so, please explain the conclusions which you reached and the basis for them.**

I calculated the fluid volumes which could have been used depending on the degree of dehydration of Lucy (please see my summary at Appendix X). None of the figures which I calculated indicated that a rate of 100mls per hour was appropriate.

(d) **Did Lucy's condition at or about 22:30 on the 12 April 2000 support the intravenous administration of solution 18 at a rate of 100 mls/hr over a period of (at least) 4 hours? Please fully explain your answer.**

Lucy's condition did not warrant IV administration of Solution 18 at a rate of100mls per hour over a period of four hours, as this was in excess of the amount of fluid that I had estimated that Lucy would have required if she had been 10% dehydrated.

(e) **Were you of the view that the administration of solution 18 at a rate of 100ml/hr for four hours was excessive? If so, why did you omit to state that in your report?**

I was of the view that the administration of 100mls per hour for four hours was excessive. I had discussed this at my meeting with both Dr Kelly and Mr Fee and stated the volumes

which might have been used, depending on the degree of dehydration. Nowhere did I state that 100mls per hour over four hours was appropriate.

(f) **Fully explain why you expressed the volume of Lucy's fluid intake by reference to a 7 hour period from the time of admission, rather than from the commencement of the intravenous fluids.**

The normal practice in terms of stating volumes of fluids which should be given to patients is generally to work out a volume to be given over a 24 hour period. This then gives the volume which should be given hourly (total daily volume divided by twenty four equals hourly volume). In expressing Lucy's fluid by reference to a seven hour period I was attempting to take into account all of the fluid which had been given to her since her admission. This included the oral fluids (50mls juice and 100mls of electrolyte solution) and the intravenous fluids (100mls per hour for four hours). In no way was I attempting to lessen the amounts given and as it can be seen in my summary under the heading fluids I clearly state that she received 100mls per hour over a four hour period.

(g) **In June 2000, what was your understanding of the propensity of a fluid overload to cause cerebral oedema?**

I was aware that fluid overload can cause cerebral oedema.

(h) **In June 2000, what was your understanding of the propensity of excess dilute/hypotonic solutions to cause cerebral oedema?**

I was aware that in certain circumstances dilute fluids can cause cerebral oedema. Please see my answer to Question 3(a) above.

(i) **Please fully explain the factors that you took into account and which led you to the conclusion that you would have been "surprised" if the volumes of fluid received by Lucy could have produced gross cerebral oedema causing coning.**

I based my opinion on the clinical experience of dealing with the administration of fluid to children over the years. The volumes of fluid referred to are those recorded in the chart as having been given before the episode of collapse around 3am. I did not feel that the volume given over the timescale should have so rapidly resulted in a gross cerebral oedema.

(j) **Why would you have been "surprised" if the volume of fluids received by Lucy could have produced gross cerebral oedema causing coning?**

Please see my answer to Question 23 (i) above.

(k) **In reaching your view that you would have been "surprised" if the volume of fluids received by Lucy could have produced gross cerebral oedema causing coning, did you give any consideration to the fact that Lucy had suffered vomiting and diarrhoea after fluids had commenced? If so what consideration did you give to those factors and what conclusions did you reach?**

I had noted the vomiting and diarrhoea as recorded in the nursing notes. Both of these would have produced fluid and electrolyte loss.

(l) **Leaving aside the 150ml of oral fluid which was given, did you give any consideration to whether the intravenous infusion of solution 18 at a rate of 100 ml/hr for (at least) a four hour period could have produced or contributed to gross cerebral oedema causing coning? If so, what consideration did you give to this issue and what conclusions did you reach?**

I consider the Solution 18 administration could have contributed to the cerebral oedema but it cannot be considered in isolation. All of the fluids given to Lucy could have contributed to the cerebral oedema including whatever proportion of 500mls of N Saline was given at the time of the collapse around 3am.

I also gave consideration to the possibility that Lucy suffered hypoxia at the time of the collapse/fit. This would have been more likely if the resuscitation was inadequate. She has respiratory support with bag and mask and two attempts to intubate her failed, before the Anaesthetist intubated her. She had reducing respiratory effort leading ultimately to apnoea. It is unusual for apnoea to occur after a fit but it can occur. Apnoea can also be caused by the administration of Diazepam. This is more likely to occur if it is given intravenously but on questioning the drug representative some years ago I was told that it can also occur with rectal administration. This information caused me to change my own practice when advising the administration of rectal Diazepam and I have commented on Diazepam as a potential factor in my summary.

(24) **Please clarify whether if it remains your view that it would be surprising if the volume of fluids received by Lucy could have produced gross cerebral oedema causing coning? If you have changed your position in relation to this conclusion please fully explain why you have changed your position.**

At the time, my view was that it would have been surprising if the volume of fluids Lucy had been recorded to have received could have produced gross cerebral oedema, within the relevant time-scale. I still feel that it is surprising but, accept that it is a possibility. At the time I had also questioned whether Lucy could have received more fluid than was recorded.

I have been unable to find an evidence based article which states what volumes of fluid over a specified time will, or will not, invariably produce coning in a child of Lucy's age and with her medical condition.

(25) *"During resuscitation it obviously became apparent that the child's sodium had dropped to 127 and potassium down to 2.5 and a decision to use normal saline was made. I am not certain how much normal saline was run in at the time but if it was suspected that she was shocked then perhaps up to 20mls/kg could have been given."* **[Ref: 033-102-273]**

(a) **Please explain how you came to the view that the drop in sodium to 127 became apparent during resuscitation? Specify any note or record which caused you to form that view.**

On reviewing the notes it is recorded that repeat U&Es were ordered possibly at 03.20. The results of which showed a sodium of 127mmol/L and potassium of 2.5mmol/L.

Perhaps, I should have said, in and around the time of resuscitation, blood was sent for analysis of urea and electrolyte and the results showed sodium of 127mmol/L and potassium of 2.5mmol/L.

(b) **Did you give any consideration to what might have caused the drop in sodium to 127? If so, what consideration did you give to this matter, and what conclusions did you reach?**

Consideration was given to the use of N/5 Saline at around 100mls per hour for four hours. I was also specifically asked by Mr Fee what part the diarrhoea could have had as a cause of sodium loss. I considered inappropriate ADH as the cause of the decreased sodium. My conclusion was that all three could have contributed.

(c) **Did you give any consideration to whether the drop in sodium, and the relatively short period of time within which this drop had occurred, may have been relevant to the production of the cerebral oedema? If so, what consideration did you give to this matter and what conclusions did you reach?**

I had been aware of rapidly falling serum sodium being a risk factor for cerebral oedema since my early Paediatric career, particularly in relation to hypernatraemic dehydration treatment.

I note the urea and electrolyte results of initial blood samples showed a time of 20.50 on 12th April 2000. There is no time noted on the results which show the sodium of 127mmol/L although this was taken during the early hours of 13th April 2000. I was aware of this information when preparing my report.

(d) **What steps, if any, did you take in order to ascertain the total volume of normal saline which had been administered to Lucy?**

I asked Mr Fee to check with the staff involved in Lucy's care how much N saline was given.

(e) **Were you at any time told that the nursing staff had advised that normal Saline was commenced at 03:15 and that 250mls had been administered by 04.00am?**

No.

(f) **Please explain why you weren't in a position to ascertain the total volume of normal saline which had been administered to Lucy?**

I was unable to identify any record of the amount of Normal Saline administered to Lucy in the Erne Hospital notes.

(g) **Did your inability to ascertain the total volume of normal saline which had been administered to Lucy have any effect on the conclusions which you were able to reach in your report? If so, please fully explain the effect that this lack of clarity had on the conclusions which you were able to reach.**

If all, or most, of the N saline had been given rapidly it could have had serious consequences both cardiovascular with possible right heart failure, and contributed to her cerebral oedema.

(h) **While you weren't certain how much normal saline was run in, from your consideration of the records were you able to estimate how much was given and the period of time over which it was given? If so, please fully explain the estimate which you made.**

No.

(i) **Did you give any consideration to whether normal saline was used appropriately in Lucy's case? If so, what consideration did you give to this issue and what conclusions did you reach?**

Normal Saline in restricted controlled amounts would be appropriate to use on finding a low sodium after the infusion of 100mls N5 Saline for four hours. The term *"and run freely into the IV line"* is not an appropriate instruction.

(j) **Did you give any consideration to whether the use of normal saline could have produced, or contributed to the production of gross cerebral oedema causing coning? If so, what consideration did you give to this issue and what conclusions did you reach?**

Please see my answer to Question 25 (g) above.

(k) **Was there any evidence in the documents before you or in the information that you were given by the Trust that led you to conclude that Lucy was shocked or that the treating clinicians suspected that she was shocked? If so, identify the material that supports either of these views.**

I felt that if the attending Physicians were giving Normal saline it was most likely the infusion was for the suspicion of hyponatraemia occurring, in which case a controlled restricted amount should have been given.

If it was as treatment for a presumed shock, then the standard regime was to give 20mls per kilogram rapidly (based on Advanced Paediatric Life Support ('APLS'); The Practical Approach (a British Medical Journal Publication)).

(l) **Fully explain the basis for your view that if Lucy was shocked (or if it was suspected that she was shocked) up to 20mls/kg could have been given. Please set out how you arrived at this calculation.**

This is a standard amount of normal saline given for shock (please see the APLS Manual)

(m) **Did you reach any conclusion in relation to the appropriate rate/volume of normal saline that should have been given to Lucy if she was not shocked? If so, please set out the conclusion which you reached and the basis for it.**

If Lucy was not shocked and the Normal Saline was given because of presumed hyponatraemia, as stated above, it should have been given in restricted, controlled amounts. I was more concerned about the possibility that large volumes of the N Saline were infused.

(26) *"I find it difficult to be totally certain as to what occurred to Lucy in and around 3.00am or indeed what the ultimate cause of her cerebral oedema was. It is always difficult when simply working from medical and nursing records and also from not seeing the child to get an absolutely clear picture of what was happening."* **[Ref: 033-102-273]**

(a) **Having reached the conclusion that you found it difficult to be totally certain what occurred to Lucy at 3.00am or what happened to cause her cerebral oedema, did you recommend to the Trust that any of the following steps should be taken:**

(i) **The Coroner should be notified;**

As stated above, it was my understanding that the Coroner had already been informed about Lucy's death by the RBHSC PICU Staff.

(ii) **The views of Lucy's family should be sought;**

No.

(iii) **Another expert should be retained;**

I had suggested to Mr Mills that if the Trust wanted a full medical legal report they should engage someone else.

(iv) **The views of the treating clinicians in the Royal should be sought;**

No.

(v) **Any particular further investigations should be conducted.**

No.

(b) **In respect of any recommendation that you may have made, please state who the recommendation was made to, when and in what form?**

Please see my answer to Question 8(i) above.

(c) **If you did not make a recommendation in relation to any of these matters, please explain your omission to do so.**

It was my understanding the Coroner was informed by the appropriate people, namely the staff at the PICU, RBHSC. It was my expectation that a Coroner's Inquest would therefore take place within the normal timescale.

(27) **In your review of Lucy's case did you give any consideration to the significance of the rotavirus? If so, what consideration did you give to this matter and what conclusions did you reach?**

Rotavirus is the commonest cause of gastroenteritis in this area. As in Lucy's case it would cause fever, vomiting and diarrhoea and can cause dehydration and electrolyte loss. I would have taken this into account in my report and it would have formed part of my overall conclusion.

(28) **The letter from the Sperrin Lakeland Trust which briefed you to conduct a review asked you to provide your opinion on the following specific issue:**

"The likely cause of the change in the electrolyte balance ie. was it likely to be caused by the type of fluids, the volume of fluids used, the diarrhoea or other factors." **[Ref: 033-102-296]**

Please clarify what conclusions, if any, you reached on this issue, and where they are to be found.

My conclusions were that the changes in the electrolyte balance could have been contributed to by the infusion of N/5 Saline in the stated volumes; fluid and electrolyte loss from vomiting and diarrhoea and possible inappropriate ADH effects in a sick child.

(29) **After delivering your written report to the Sperrin Lakeland Trust, did you have any further involvement in the Trust's consideration of Lucy's treatment and death? If so, please outline the nature of your further involvement and when this took place.**

I had no further involvement or contact with the Trust in respect of this matter until I was "door stepped" by a UTV reporter in 2004, sometime following the Inquest.

(30) **Did you report your involvement in examining Lucy's case to any of your professional colleagues at the Altnagelvin Hospital or elsewhere? If so, please address the following matters:**

(a) **Who did you report your involvement to?**

I may have had general discussions with my colleagues in Altnagelvin when it became apparent that Lucy had died following treatment in the Erne Hospital.

I had a brief discussion with Dr Moira Stewart, the Royal College of Paediatrics and Child Health representative. I presume this was after she was contacted by the Sperrin Lakeland Trust in her capacity as the Royal College Representative. I have no recollection of the detail discussed with Dr Stewart. It was only when preparing this Witness Statement that I first had sight of Dr Stewart's report.

(b) **What did you report?**

Please see my answer to Question 30(a) above.

(c) **When did you report?**

Please see my answer to Question 30(a) above.

(d) **What information, if any, did you share with your professional colleague(s) about the treatment of Lucy, her condition and the cause of her deterioration and death?**

Please see my answer to Question 30(a) above.

IV. **Other Matters**

(31) **How would you categorize the quality of care which was provided to Lucy Crawford at the Erne Hospital? In addressing this question please refer to each of the factors which have caused you to reach this view.**

The concerns about the care provided to Lucy during her stay at the Erne Hospital are solely based on sight of copies of her hospital notes. As stated in the last paragraph of my summary, it is always difficult to fully assess the situation without having seen the child. The recording of events in the medical notes is sparse and I had to rely on the Nursing notes for a lot of the details. My feeling was that Lucy was more ill on admission than originally assessed. There was no prescription written for the N5 Saline solution which resulted in it being given at 100mls per hour for four hours. There is an inadequate description of the "fit" which occurred at approximately

3am, to allow it to be determined whether this was a tonic clonic fit or cloning. There is no prescription written in the fluid chart or medical notes to say what volume or rate the N Saline should be given at. The statement in the Nursing notes that it should be allowed to run freely into the IV line is an inappropriate instruction. I could find no record of how much of the N Saline solution was actually given.

It is difficult to assess the quality of the resuscitation of Lucy before the Anaesthetist arrived. The above remain concerns about the quality of care provided.

(32) Provide any further points and comments that you wish to make, together with any documents, in relation to:

(a) The cause of Lucy's death;

As I understand it, following the Coroner's Inquest, Lucy's death was attributed to cerebral oedema as a consequence of administration of hypotonic saline solution. This conclusion was obviously recorded after consideration of all the facts and not just what was available in the copies of the Erne Hospital notes.

(b) The role performed by you, the Sperrin Lakeland Trust or others when reviewing or investigating issues relating to the cause of Lucy's death;

I, and all three of the staff at Sperrin Lakeland Trust with whom I was in contact (Mr Mills, Dr Kelly and Mr Fee), were trying to establish what exactly happened to Lucy during her time in the Erne Hospital

Dr Kelly asked me if Dr O'Donohoe should be suspended from duties. I consider that the fact Dr Kelly asked this questions shows that he was not attempting to hide any facts.

(c) The procedures which were followed when reviewing or investigating issues relating to the cause of Lucy's death;

My only involvement in the process was to perform the case note review, discuss my findings with representatives of the Trust and answer further questions that they put to me at the time. I did eventually agree to produce a written summary of some of what was said at the meeting for the purpose of being used in the internal inquiry of the Sperrin Lakeland Trust.

(d) Lessons learned from Lucy's death and how that affected your practice at Altnagelvin or elsewhere;

I have always been cautious in my use of intravenous fluids and indeed favour oral rehydration where possible, which followed my two years of working in South Africa. The need for a fluid prescription to be written in the fluid chart and signed precisely outlining the volume to be given and at what rate is essential. The dangers of excessive fluid administration were highlighted and the need for more comprehensive clinical notes was an informed important lesson.

(e) Any other relevant matter.

I wish to express my sympathies to the families of all those involved.

THIS STATEMENT IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF

Signed: [signature] Dated: 9th Nov 2012

G.P. letter: DOB 5/11/98

History [illegible] not responding to Calpol.
Drowsy + lethargic
floppy not drinking
Temp. 38° [illegible]
[illegible]
[illegible]

Communication [illegible]

Admitted 12/4/00 19-30 hrs.
History fever 36 hrs. not feeding 5 days
vomiting 36 hrs.
Drowsy 12 hrs.
normal stools no rash..
P.H. Bronchiolitis
Drugs Calpol p.r.n. (2%)
O/E Temp 38°C. wt 9.14 Kg. capillary refill > 2 secs.
Abdo soft BS. [illegible]
Δ Viral illness.

Encourage oral feeding.
Check urine [illegible] + nitrates.
Bloods FBC U+E glucose CRP B.C.

Hb 12.1 WCC 15 N13 N 13.7. AG 397
Na+ 137 K+ 4.1 Cl 105 Ca 2.16 urea 9.3. gl. 4.5
Urine Protein ++ Ketones ++. no [illegible]

23-00 i.v. line inserted by Dr. J. O'D.
No.18 solution at 100 mls/hr

02-30 large soft / runny B.O. [illegible] → side room.
0255 [illegible] Buzzed nurse – child rigid in mothers arms
0300 2nd nurse called
Colour + resp. satisfactory.
Dr. Malik bleeped → O2 given + turned on side.
Dr. Malik ordered 2.5 mg diazepam → within 1 min large BO.
i.v. fluids changed to
0315 0.9% NaCl [illegible] into i.v. line.
03 20 decreased resp. effort noted. airway inserted + bagged by Dr. Malik.
→ Dr O'D arrived. Intubation attempted / colour noted to remain poor
04.. → anaesthetist intubated Na+ 132 K+ 2.8
[illegible] 100 [illegible] given urea 4.9 Bx 12

04 35 → ICU. [illegible]

→ ventilation. no spontaneous resp. O2 100%

Pupils fixed & dilated. Hypothermic.

Mannitol 20% 25mls over 30 mins.

05.15 [illegible] 15m.

i.v. fluids at 30 mls / hr.

06.30 → Transfer [illegible] ICU

Urine culture -ve

CRP 11.2 (0-10)

B.C. -ve Rotavirus +ve

P.A. Rotavirus GE. Cerebral oedema.

Smitten 7pm

9 pm. 50 mls juice

10 pm. 100 mls Dioralyte.

8pm 20 mls urine

11pm sleep.

11	? 100 mls
12	100
1	100
2	100

7hrs 550 mls
= 80 mls/hr.

0% ↑ 45 mls/hr.
5% dehydration = 60 mls/hr
17 10% dehydration = 80 mls/hr.

— Why 'floppy' in 1st place

— Was episode a fit or coning.

— Apnoea ? Diazepam — said 5 hours BO.
within 1 min
So dose unlikely to have
been absorbed
Dose 500 mg/1.51
Could have been given up to 4-5 mg.

most excessive dose

— Resuscitation — ? adequate.

— 500 mls N/saline at 3am.
(Total blood volume is 720 mls.)

— → 300 mls/hr.

— Urinary out-put — ? small < Dehydration / Renal problem < 1°y / 2°

— i.e. fluid chart No amount/hr. of fluids prescribed

— Δ Cerebral oedema — ? Encephalitis / ? oedema.

Why Floppy in first place?

Was she dehydrated? — Urea 9.9

Fluids N/5 = appropriate

RATE 0% dehydration 45mls/hr.
5% " 60 mls/hr
10% " 80 mls/hr.

She got 150 mls orally
400 mls IV (→ 100mls/hr. for 4 hrs)
= 550 mls.
[illegible] FROM ADMISSION → 3 am was 7hrs.
fluids given = 80 mls/hr
NO PRESCRIPTION WRITTEN FOR FLUIDS.

WAS THERE RENAL COMPROMISE — URINARY out not NOTED
? ANY OEDEMA of FACE or PERIPHERIES.

FIT or CONING

APNOEA fit / cerebral oedema / coning

medication 2.5 mg DIAZEPAM

RECOMMENDED DOSE is 300 µg/KG.

WAS DOSE EXCESSIVE? should not have been

? idiosyncratic reaction
? NOT related. – passed [illegible] within 1 min of administration.

RESUSCITATION ? ADEQUATE.

HAD GOOD HEART RATE + COLOUR NOTED

FLUIDS GIVEN ? TOO MUCH

? 500 mls N SALINE RUN INAPPROPRIATELY

DROP IN SODIUM. 137 → 127 K+ 4.1 → 2.5.

P.M. ? RESULTS.