Witness Statement Ref. No. 292/1

NAME OF CHILD: RAYCHEL FERGUSON (LUCY CRAWFORD)

Name: Peter Crean

Title: Doctor

Present position and institution:

Consultant Paediatric Anaesthetist, Royal Belfast Hospital for Sick Children

Previous position and institution:

Consultant in Paediatric Anaesthesia and Intensive Care, Royal Belfast Hospital for Sick Children
[As at the time of the child's death]

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

In N Ireland:

Chairman of the Paediatric Anaesthetic Group in N Ireland 1999-2004

Member of N Ireland Working Group on Hyponatraemia in Children 2001-2002

Member of the Human Organs Enquire Implementation Sub-group on the guidance to the HPSS and consent 2002-2004.

Member of the Human Organs Enquiry Implementation Sub-group on Public Information and Communication 2003.

Northern Ireland Regional Paediatric Fluid Therapy Working Group 2006.

Member of 'Pediatric Surgery Working Group Phase 1', Department of Health, N Ireland. 2008

Member of the Paediatric ENT Surgery Group, Department of Health, N Ireland, 2008-9

Guideline and Audit Implementation Network (GAIN). Member of Guideline Development Group on Hyponatraemia in Adults. 2008-9

National:

Member of Working Group on Paediatric Anaesthesia and Emergency Care in District General Hospitals 2004-6.

"Care of the acutely ill or injured child: a team response" published 2006

Member of External Reference Group, Children's Hospital Service Pilot Improvement Review, Healthcare Commission. 2004-2005

Member of the Children's Surgical Forum, Royal College of Surgeons, England 2005-07

President of the Association of Paediatric Anaesthetists of Great Britain and Ireland 2005-7

'Joint statement on the provision of general paediatric surgery provision in the District General Hospital', 2006. Member of the working group and co-signatory as President of the APA.

Member of working group revising 'Children's Surgery: a first class service'. 2006-07. 'Surgery for children - delivering a first class service' published July 2007

NICE Guideline Development Group on Sedation in Children 2008 - 2010

NCEPOD Advisor 2009 - 2011 on deaths following surgery in children. 'Are We There Yet?' Published October 2011.

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:

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 to your statement.

(1) Please look at the typed note made by you in Lucy's case notes headed *"Ward Round -Thursday 13 April 2000- PICU-Consultant -Dr P Crean"* [Ref: 061-018-065].

"I am awaiting faxes of her notes from the Erne Hospital and she is to be reviewed by a Paediatric Neurologist this morning" **[Ref: 061-018-065]**

Arising from that please answer the following questions:

(a) At what time (approximately) was your Ward Round in the PICU on 13th April 2000?

I am unable to recollect the events on the 13th April 2000, however, it would have been usual to start the ward round at 09.00. This would be completed sometime in the morning, the time being dependent on the number and complexity of the patients being reviewed. On occasion, the ward round may have ended at 10.30, whereas if there were more children on the ward or certain treatments required, it could have been lunchtime before the ward round was completed.

I am aware, from the Admissions Book on th e ward, which records all admissions to PICU, that there were already two children in PICU when Lucy arrived and a further 3 admissions during the day on 13th April 2000. PICU would, therefore, have been very busy on 13th April 2000.

As Lucy had arrived just after 8 am, it is likely I spent time during the initial part of the day further stabilising her. Also I note that I spoke to her parents at approximately 10.00 am (061-031). Dr Hanrahan, when he reviewed Lucy at 10.30 am, requested a CT scan. In 2000 there was not a CT scanner in RBHSC; children had to be taken over to the Neuroradiology Department in the RVH to have scans. It is likely that I transported Lucy, by ambulance, to the Neuroradiology Department so that the CT scan could be carried out. The time on the CT scan is 12.26 pm. I would then have to wait for an ambulance to transport her back to PICU. It is unlikely that I arrived back to PICU before 1.00 pm.

(b) Did you request faxes of her notes from the Erne Hospital?

From the records, it would appear that a request for her notes to be faxed to PICU was made, however, I am unable to recollect if I made that request. It was, and still is, usual practice to receive a copy of a patient's notes from the referring hospital when a patient is being transferred. If a photocopy of the notes does not accompany the patient when transferred, a copy of the notes will usually be faxed to PICU. To the best of my knowledge, when Lucy was transferred to the RBHSC, no notes were brought with her, only a transfer letter.

(c) When were faxes of Lucy's notes requested?

I have no recollection at what time faxes were requested.

(d) Why were faxes of Lucy's notes requested?

The notes were requested to bring the PICU team up to date with the clinical history and management before transfer.

(e) What did you intend to do when the faxes of Lucy's notes arrived?

Although I do not specifically recollect what I intended at the time, it would be my usual practice to have looked at the notes in order to establish what the patient's clinical history and management prior to transfer had been.

(f) Did you do as you intended?

Although I have no recollection of the specific details of what I did on that particular day, it would have been my normal practice to review the notes of a child who has been transferred to PICU.

(g) Did you discuss Lucy's case with the Paediatric Neurologist, Dr Hanrahan? If so please provide full details of the discussion.

I have no recollection of a discussion but it would have been my normal practice to discuss the case with the other medical staff involved with the patient's care.

(2) Please look at your evidence to the Coroner's inquest at the bottom of page Ref: 013-021-73a, where you said, in answer to Mr Good, *"The fluid management chart arrived at Royal Belfast Hospital for Sick Children at 8.53am on 13th April 2000."* Arising from this, please confirm that you agree that the fluid management chart arrived in the Royal Belfast Hospital for Sick Children at 8.53am on the 13th April 2000.

I do not have an independent recollection of the time the faxed notes arrived. At the time of the Coroner's Inquest, I presumed that 08.53 was the time the fax was received because 08.53 is the time printed at the top of each sheet faxed (for example, 061-017-054). However, I now note, upon further review of the notes for the purposes of responding to this question, that there is a different time at the bottom of each sheet faxed, which is 09.51. I am now uncertain when exactly the fax arrived. It is possible that 08.53 was the time the fax was sent and 09.51 the time received. If this was so, the fax would probably have arrived during the morning ward round and I may not have seen it until after the ward round. I am also unable to state whether the timings on the fax machine are accurate.

(3) Please look at the faxed copy of the Erne Hospital fluid balance chart in the records of the Royal Belfast Hospital for Sick Children at Ref: 061-017-056 and answer the following questions.

(a) Did you read this chart? If you did not, please explain why you did not. If you did read it please answer the further questions (b) to (e) below

After the passage of time, I have no recollection of reading the chart, however, I presume I did, as this would be my usual practice once notes were received from a transferring hospital.

(b) When did you first read this chart?

I do not recollect when I first read the chart.

(c) What conclusions did you reach after reading the chart as regards the fluids administered to Lucy in the Erne?

I do not recall what conclusions I reached after reading the chart regarding the fluids administered to Lucy in the Erne Hospital. Upon review of the Fluid Balance chart now, however, it is not clear to me how much fluid was actually administered to Lucy.

(d) Did you have any questions about the information in the chart?

I cannot recollect what, if any, questions I had about the information in the chart at the time.

(e) What further steps did you take after reading it?

I do not have a direct recollection of what steps I took after reading the Fluid Balance Chart. I note, however, that Dr O' Donohoe, at the Erne Hospital, has made a retrospective note in the Erne Hospital chart [027-010-024] regarding a telephone call that I made to him. Whilst I do not recall this telephone call, I have no reason to believe that it did not happen. Dr O'Donohoe's note suggests that I had had the opportunity to consider the fluid balance chart prior to the telephone conversation.

(f) Did you discuss the information in the chart with any of your clinical colleagues?

I have no recollection of discussing the information in the chart with any of my clinical colleagues and am not, therefore, able to answer the below questions.

If so:

(i) With whom did you discuss it?

(ii) When did you discuss it?

(iii) Give details of the discussion.

(iv) Describe any conclusions reached.

(4) Please look at the entry in the Erne Hospital Notes made by Dr J O'Donohoe at Ref: 027-010-024. ***"Yesterday Dr Peter Crean rang from PICU RBHSC to enquire what fluid regime Lucy had been on. I told him a bolus of 100mls over 1 hour followed by 0.18% NaCl Dextrose 4% at 30 ml/hour. He said he thought that it had been NaCl 0.18% Dextrose 4% at 100ml/hour. My recollection was of having said a bolus over 1 hour and 30 ml/hour as above."***

Did you telephone Dr O'Donohoe to enquire what fluid regime Lucy had been on? If so please answer the following:

(a) Please state the date and (approximate) time of the call.

As stated above, I have no recollection of making the telephone call and am not, therefore, able to comment on the date and/or time of the call.

(b) Is Dr O'Donohoe's note an accurate record of the discussion? Please indicate any areas of disagreement.

As I have no direct recollection of the telephone call, I am unable to confirm whether the note is accurate.

(c) Please give full details of your recollection of the discussion.

I have no direct recollection of the telephone call or the contents of any discussion that I had with Dr O'Donohoe.

(d) Why did you want to establish what fluid regime Lucy had been on?

As part of Lucy's initial resuscitation, it would have been helpful to have full knowledge of her fluid regime, as well as the rest of her clinical history, as with any unwell child who has been transferred from another hospital.

(e) Did you think when you spoke to Dr O'Donohoe that the fluid regime was NaCl 0.18% Dextrose 4% ("Solution No.18") at 100mls per hour? If so, please answer the following questions.

I do not recollect my discussion with Dr O'Donohoe or what I thought at the time.

(i) **What was your source for that information?**

As I do not recollect this discussion I am unable to answer this question.

(ii) **Did you have a view as to the appropriateness of that fluid regime? Please give reasons for your answer.**

I am unable to recollect what my view was at that time. However, I anticipate that, on looking at the Erne fluid balance chart now, I would have had specific concerns regarding the administration of boluses of hypotonic fluids to children.

It would appear from Dr Donohue's note that he wished to give a bolus of fluid to Lucy. Fluid boluses would normally be given to improve the circulation. It would have been normal practice to use normal saline as the bolus fluid. The administration of large volumes of hypotonic solutions may produce very low concentrations of electrolytes, in particular sodium, leading to undesirable fluid shifts.

The volume of fluid given would have depended on the patients maintenance requirements and the degree of fluid deficit. A fluid deficit would normally have been replaced with normal saline.

(f) **What conclusions did you reach as regards Lucy's fluid regime following your conversation with Dr O'Donohoe?**

I do not recall what conclusions, if any, I reached regarding Lucy's fluid regime following my conversation with Dr O'Donohoe.

(g) **Did you make a note of your conversation with Dr O'Donohoe? If you did, please provide a copy of the note. If you did not, please explain why you did not.**

I did not make a note of my telephone conversation with Dr O'Donhoe. I would not make a note of every telephone call that I have with colleagues as it would depend what was discussed. I am, however, unable to recollect the reason why I did not make a note in this case.

(h) **Did you tell any of your clinical colleagues of your conversation with Dr O'Donohoe? If you did please answer the following questions. If you did not, explain why you did not.**

I do not recall if I told any of my clinical colleagues about my conversation with Dr O'Donohoe. I am not, therefore, able to answer the following questions.

(i) **Whom did you tell of your conversation with Dr O'Donohoe?**

(ii) **When did you provide the information?**

(iii) **Detail the discussion which you had.**

(iv) **Detail any conclusions reached.**

(5) Did you have any other contact or discussion with Dr O'Donohoe or any of the clinicians in the Erne Hospital regarding Lucy? If so, please give full details.

I have no recollection of having further discussions with Dr O'Donohoe or other clinicians in the Erne Hospital regarding Lucy.

(6) When did you last have any involvement in Lucy's care or treatment? Please give details of your involvement on that occasion.

I believe I looked after Lucy on Thursday 13th April 2000 only. Normally I would leave PICU in the evening, at approximately 17.30 or 18.00, so my involvement in her care would have ended then unless I was on-call. I cannot recollect whether, or not, I was on-call on 13th April 2000.

(7) When did you learn that Lucy had died?

I learned of Lucy's death on the day she died.

(8) Did you give any consideration to the cause of Lucy's death? If so, please give details of :

(a) When you considered the cause of Lucy's death.

I believe I considered this when she died and subsequently when asked to review her care for the Coroner in 2003 (006-061).

(b) The factors you took account of in considering the cause of Lucy's death.

At the time of her death all I remember was that she had developed acute neurological deterioration. There were several potential causes for this and Dr Hanrahan, the paediatric neurologist, took the lead in investigating these.

I remember having concerns regarding her fluid management, however, it is difficult to separate these memories from what I have come to know subsequently.

Now, looking at the faxed fluid balance chart from the Erne Hospital, it appears that this was not completed fully, so the total fluid administered at that time was unclear. Also, the note written by Dr O'Donohoe suggests a different rate of fluid administration than that recorded as having been administered in the fluid balance chart.

It was known to me, at that time, that acutely developing hyponatraemia could cause neurological decompensation.

(c) The conclusions you reached as regards the cause of Lucy's death.

As stated above, at the time of Lucy's death, all I remember was that she had developed acute neurological deterioration.

In 2003, the Coroner, Mr John Leckey, asked me to review Lucy's chart (006-061). At that time, all investigations that had been conducted on Lucy had been completed. The results from the viral cultures taken and metabolic investigations, prior to Lucy's death, were all normal. This ruled out some potential causes for Lucy's death. It then became clear to me that Lucy's care in the Erne Hospital should be further reviewed. The administration of hypotonic fluids could have caused dilutional hyponatraemia to develop. At the time I was asked to review Lucy's notes, I had been recently involved in Raychel Ferguson's Inquest and consequently it is possible that I was particularly alive to the possibility of dilutional hyponatraemia at that time.

(d) The persons (if any) with whom you discussed your consideration of Lucy's death?

I discussed this with the Coroner in 2003.

(9) Were you party to any discussion with any of your colleagues in the Royal Belfast Hospital for Sick Children (RBHSC) regarding reporting Lucy's death to the Coroner? If so, please give full details.

I have no recollection of such discussions, however, at the time it was my understanding that the death was to be reported to the Coroner and it is my understanding that this did happen.

(10) Were you party to any discussion with any of your colleagues in the RBHSC regarding the completion of a medical certificate of cause of death in respect of Lucy? If so, please give full details.

I cannot recollect being party to any discussion with any of my colleagues in the RBHSC regarding the completion of a medical certificate of cause of death, although it is possible that such discussions did take place.

(11) Were you party to any discussion with any of your colleagues in the RBHSC regarding the referral of Lucy for a consent post-mortem? If so, please give full details.

I have no recollection of involvement in any discussions.

(12) Please look at the statement of Dr Caroline Stewart to the PSNI dated 9 April 2005 [Ref: 115-022-001] At Ref: 115-022-002 she stated: *"I stated on the Autopsy form that the Clinical Diagnosis was Dehydration and Hyponatraemia, Cerebral Oedema, Acute Coning and Brain Death. This information was on the basis of the clinical information available, which was the working pathogenesis agreed by Dr Hanrahan and the anaesthetists, in the absence of a definitive aetiological diagnosis."* Arising from that:

(a) Were you involved in agreeing any such "working pathogenesis" in respect of Lucy?

I have no recollection of agreeing a "working pathogenesis" in respect of Lucy. I would, however, not disagree with anything Dr Stewart has recorded on the Autopsy Form request.

(b) If you were, please fully describe:

As I do not recollect being party to such discussions I am unable to answer the following questions.

(i) Who else was involved;

(ii) How this working pathogenesis was arrived at.

(iii) Whether consideration was given to the possible cause of the cerebral oedema, and, if so, the outcome of that consideration.

(13) Did you (or, insofar as you are aware, anyone in RBHSC) write a discharge letter in respect of Lucy to her GP? If so, please confirm the following:

As an anaesthetist working in PICU at that time, it would not have been my practice to write discharge letters. This would normally have been undertaken by the consultant paediatrician or consultant surgeon in charge of the case. However, I note on file 061-012 that an Inpatient/Outpatient Advice Note was completed by Dr Dara O'Donoghue on 17th April 2000. A copy of this would normally have been sent to the GP.

(a) Provide a copy of the discharge letter;

I am unaware of whether a discharge letter was prepared and do not hold a copy of one.

(b) State whether the discharge letter was copied to the Erne Hospital, and if so, to whom.

I am unaware whether the discharge letter, if one was prepared, was copied to the Erne Hospital.

(14) Did you complete or sign off a PICU Coding Form in respect of Lucy? If so, please provide a copy.

I did not sign off a PICU coding form in respect of Lucy.

(15) Please outline the processes which were available within the RBHSC in the year 2000 to facilitate investigation or review of a death, where that death was considered to have been unexpected, unexplained, or where there might have been concerns that it had arisen out of an adverse clinical incident.

Unexpected or unexplained deaths would have been referred to the Coroner.

Deaths would have been reviewed in the Mortality Section of the Audit Meeting.

Although Adverse Incident Reporting was introduced to the Trust in 2000, this was rolled out across the organisation in the subsequent two years. It was not, to my knowledge, embedded in practice at the time of Lucy's death.

(16) Was Lucy's death investigated or reviewed under any of the processes set out in your answer at 15 above? If so, outline the nature of any investigation or review which took place and the conclusions that were reached. If no such investigation or review took place, please explain why this omission occurred.

Lucy's death was initially referred to the Coroner in 2000, however, this was not accepted as a Coroner's case at that time.

I understand that Lucy's death was discussed at the hospital Mortality Meeting although I have no independent recollection of this.

(17) Please look at Ref: 061-038-123 where it is stated- "2. ***Lucy's death was discussed in the mortality section of an RBHSC Audit meeting. This meeting was chaired by Dr. R H Taylor, Consultant Paediatric Anaesthetist, Paediatric Intensive Care Unit, Royal Belfast Hospital for Sick Children, 10 August 2000."*** **(Ref: 061-038-123)**

Arising out of the foregoing please address the following matters:

(a) What, insofar as you are aware, was the function or purpose of the mortality section of Audit meetings in the RBHSC?

The mortality section of the Audit meeting was to review all deaths occurring in RBHSC.

(b) How often, insofar as you are aware, did mortality meetings take place in the period around 2000?

These usually took place on a monthly basis.

(c) Describe the process, in 2000, by which a particular death was identified for discussion at Audit meetings, and outline the factors that determined that a particular death would be discussed?

My understanding is that all deaths that occurred within the RBHSC were reviewed at the Audit meetings. I anticipate, however, that the Audit Coordinator would be best placed to explain that this is correct or if some additional criteria were applied as to which cases were discussed.

(d) Did you attend the mortality section of the Audit meeting which discussed Lucy's death on the 10th August 2000? If so:

I have no recollection if I attended the Audit meeting on 10th August 2000. I am, therefore, unable to answer the following questions.

Identify all of those persons who attended that meeting and who were present when Lucy's death was discussed.

(i) Describe the information that was given to the meeting in relation to the death of Lucy, and identify the person(s) who provided that information to the meeting.

(ii) Please outline and describe the matters that were discussed in relation to the death of Lucy.

(iii) Clarify whether the meeting discussed the relevance of fluid management in relation to Lucy's death? If so, please fully outline the nature of those discussions. If those matters were not discussed, please explain why they were not discussed.

(iv) Clarify whether the meeting considered the case records from the Erne Hospital. If so, please outline the conclusions, if any, that were drawn from a review of those records.

(v) Clarify whether the meeting made any assessment of the correctness of the treatment which Lucy received at the Erne Hospital? If so, please outline the conclusions if any which were reached following any such assessment.

(vi) Clarify whether the meeting reviewed the autopsy report which had been prepared by Dr O'Hara, or the death certificate signed off by Dr Dara O'Donoghue? If either of these documents were reviewed, please outline the conclusions , if any, which were reached following any such review.

(vii) Were any conclusions reached in relation to the death of Lucy following this discussion? If so, please outline the conclusions that were reached.

(e) **Whether or not you attended the meeting, did you know that Lucy's death was discussed at the Audit meeting on the 10th August 2000? If so please answer the following:**

With the passage of time, I have no recollection if I knew if Lucy's death was discussed at the Audit meeting on 10th August 2000.

(i) Did you provide any information or documentation for consideration at that meeting? If so, specify the information or documentation that you provided?

I do not recollect having provided any information or documentation for consideration at that meeting. The Medical Chart would normally have been made available.

(ii) Who identified Lucy's death as one which ought to be discussed at the Audit meeting?

As stated above, it is my understanding that all deaths within the RBHSC are discussed at Audit meetings.

(iii) Why was Lucy's death discussed at the Audit meeting?

As stated above it was my understanding that all deaths in the RBHSC were discussed at the Audit meeting.

(iv) Did you delegate any member(s) of your clinical team to attend the meeting? If so identify the person(s) to whom you delegated this task.

Normal practice was that all available medical staff would attend the audit meeting. If I was not present it is, therefore, unlikely that I would have specifically delegated a member of the team to attend in my place, however, it is probable that members of my clinical team would have been present.

(v) **Did you receive any information as to the discussion of Lucy's death at the meeting or the outcome of that discussion? If so, please provide full details of that information, and, if the information was in writing, a copy of the document in which it is contained.**

To the best of my recollection, I did not receive any information regarding the discussion of Lucy's death at the meeting or the outcome of the discussion.

(vi) **Insofar as you know, were any follow-up investigations or inquiries conducted after this meeting, or was any action taken on foot of what was discussed at this meeting? If so, fully describe the investigations, inquiries or action which resulted.**

I do not recollect if any further action was taken.

(vii) **Insofar as you know, were the circumstances leading to Lucy's death discussed between the RBHSC and the Erne Hospital/Sperrin Lakeland Trust before the Audit meeting on the 10 August 2000? If so, please outline the nature of those discussions and identify the persons who participated in them.**

I do not recollect if any such discussions took place.

(18) **Following the Inquest into Lucy's death which took place in February 2004, were the issues relating to Lucy's death revisited by the RBHSC in the context of its audit arrangements or otherwise.**

I have no recollection if these issues were revisited.

(19) **Apart from the discussion of Lucy's death as part of the mortality section of the Audit meeting on the 10 August 2000, was her death and/or the cause of her death otherwise the subject of discussions between you and any of your medical colleagues in the Royal Belfast Hospital for Sick Children at any time?**

If her death was otherwise the subject of such discussions please address the following matters:

I am sure I discussed Lucy's death with colleagues at the time of her death, at the time of the inquest and when she was included in the Inquiry. However, I am unable to recollect specific events or contents of discussions and am not, therefore, able to answer the following questions.

(a) **Whom did you have such discussions with?**

(b) **When did such discussions take place?**

(c) **What aspects of her death and/or the cause of her death were discussed, and what views were expressed?**

(d) **Were any conclusions reached as a result of such discussions?**

(e) **Was any action taken on foot of such discussions?**

(20) **Please provide any further points and comments which you wish to make, together with any documents, in relation to:**

(a) **The cause of Lucy's death;**

Any review, audit, and/or investigation into Lucy's death;

(b) **Lessons learned from Lucy's death;**

(c) **Any other relevant matter.**

Looking back at the events relating to Lucy's treatment I think we did not fully consider the timing of the blood test taken around the time of her acute deterioration in the Erne Hospital. Although a sodium level of 127 may not be as low as one may expect to produce cerebral oedema caused by dilutional hyponatraemia, the rate of fall from the normal value is the most important factor. It may, however, also be that the blood test for sodium estimation around the time of her collapse may have taken place during or after she had received the 500 ml of normal saline. If this is correct, then I think her sodium level at the time of her acute deterioration was probably much lower than 127 and, if this had been considered, dilutional hyponatraemia would have been a more obvious cause of the development of cerebral oedema.

On reviewing files on the Inquiry website I note a faxed letter (006-001-112), dated the 7th January 2004, from Dr O'Donohoe. It appears that the blood sample for sodium estimation was in fact taken when Lucy had received almost 500 ml of normal saline, following her acute collapse. The infusion of normal saline would have significantly elevated her serum sodium level above that at the time of her deterioration. In my opinion the sodium level at the time of her acute collapse was most likely less than 120.

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

Signed: **Dated:** 7 November 2012