Witness Statement Ref. No. 289/1

NAME OF CHILD: RAYCHEL FERGUSON (LUCY CRAWFORD)

Name: Donncha Hanrahan

Title: Doctor

Present position and institution:

Consultant Paediatric Neurologist, RBHSC

Previous position and institution: Consultant Paediatric Neurologist, RBHSC.
[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 - August 2012]

Training Committee, British Paediatric Neurology Association 2002-2008

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

WS 039/1 19 July 2005

WS 039/2 14 June 2012

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.

I. QUERIES IN RELATION TO YOUR MEDICAL QUALIFICATIONS, EXPERIENCE, TRAINING AND RESPONSIBILITIES

(1) Please provide the following information:

(a) State your medical qualifications as of April 2000.

MB, BCh, BAO, MRCPI, MD, FRCPCH.

(b) State the date you qualified as a medical doctor.

June 1985.

(c) State the date of your appointment to the post of Consultant Paediatric Neurologist at the Royal Belfast Hospital for Sick Children (RBHSC).

July 1998.

(d) List all the professional posts held by you before and since the date of your appointment as Consultant Paediatric Neurologist at RBHSC and provide the dates of each such appointment and its duration.

Jan-June 1998 **Honorary Senior Registrar in Neurophysiology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH**

Aug-Dec 1997 **Senior Registrar in Paediatric Neurology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH**

July 1997 **Honorary Registrar in Neurophysiology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH**

Jan-June 1997 **Senior Registrar in Neurodevelopment and Neurodisability, Donald Winnicott Centre, Queen Elizabeth Children's Hospital, London E2**

Jan-Dec 1996 **Senior Registrar in Paediatric Neurology and Paediatrics, The Royal London Hospital, Whitechapel, London E1 1BB**

Oct 1993 - Oct 1995 **Research Fellow, Royal Postgraduate Medical School, Hammersmith Hospital, Du Cane Road, London W12 0HS**

August 1993 **Locum Registrar in Paediatric Neurology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH**

Feb-July 1993 **SHO in Paediatric Neurology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH**

May 1992 **Locum Consultant Paediatrician, Mullingar General Hospital, Co Westmeath**

June 1992 **Locum Consultant Paediatrician, Castlebar General Hospital, Co Mayo**

July 1991-April 1992 **Registrar in Paediatric Neurology, Royal Hospital for Sick Children, Yorkhill, Glasgow G3 8SJ**

Jan-June 1991 **Registrar in Paediatrics, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12**

Jan-Dec 1990 **Registrar in Paediatrics and Paediatric Neurology, The Childrens' Hospital, Temple Street, Dublin 1**

Jan-Dec 1989 **Registrar in Neonatology, National Maternity Hospital, Holles Street, Dublin 2**

July-Dec 1988 **SHO in Neonatology, National Maternity Hospital, Holles Street, Dublin2**

Jan-June 1988 **SHO in Paediatric Neurology, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12**

July-Dec 1987 **SHO, St Vincent's Private Hospital, Elm Park, Dublin 4**

Jan-June 1987 **Medical SHO, St Mary's Hospital, Cappagh, Dublin 11**

July-Dec 1986 **Surgical SHO, St Mary's Hospital, Cappagh, Dublin 11**

Jan-June 1986 **Surgical Intern, St Vincent's Hospital, Elm Park, Dublin 4**

July-Dec 1985 **Medical Intern, Monaghan Co. Hospital, Co. Monaghan**

(2) **At any time prior to April 2000 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**

Only as part of general training. Specific training was not provided to my memory. The risks of dilutional hyponatraemia were known to me, although particularly in the context of hypernatraemia, when it is standard practice to bring down the sodium level in guarded fashion by not using dilute fluids .

and if so please state.

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

(b) When was it provided?

(c) What form did it take?

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

(3) At any time prior to April 2000 had you received any form of advice, training or education in order to inform you of the issues relating to hyponatraemia in paediatric case

See (2)

and if so please state :

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

(b) When was it provided?

(c) What form did it take?

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

(4) Decribe in detail your experience, prior to April 2000, of dealing with children with hyponatraemia including :

(a) Estimated numbers of such cases;

(b) Nature of your involvement;

(c) Outcome of the cases.

I cannot quantify this. Hyponatraemia is a very common biochemical finding and I would have frequently encountered and treated children with this entity, particularly during my period in general paediatrics up to 1991. I cannot recall a specific case involving hyponatraemia severe and acute enough to lead to cerebral oedema.

(5) Describe in detail your experience since April 2000, of dealing with children with hyponatraemia, including:

(a) Estimated numbers of such cases;

(b) Nature of your involvement;

(c) Outcome of the case

As for (4). Being involved solely in paediatric neurology, I would order and perform less electrolyte measurement than I would have in the past. Nevertheless, low sodium levels are frequently encountered, but I cannot provide exact numbers. To my knowledge, Raychel Ferguson is the only child I have encountered since 2000 with dilutional hyponatraemia severe and acute enough to lead to cerebral oedema.

II. QUERIES IN RELATION TO YOUR DEPOSITION TO THE CORONER'S INQUEST [Ref: 013-031-111 to Ref: 013-031-116]

(6) *"Lucy Crawford arrived in Paediatric Intensive Care at approximately 8.30 am on 13th April. I first reviewed her approximately two hours later at 10.30. At my initial assessment, I did not have access to her Eniskillen notes. An entry in her notes relating to the ward round of that*

morning by Dr Crean, stated that he was awaiting the faxes of her notes and that she was to be reviewed by a Neurologist that morning. It was shortly after that that I saw her and it was subsequent to my reviewing her that Dr Crean's typed up entry was inserted into her notes"[Ref: 013-031-111]

(a) **Please confirm that you made the entry in the hospital notes beginning half way down Ref. 061-018-060 and ending at the bottom of Ref: 061-018-063.**

Yes.

(b) **Approximately how much time did your 10.30 review of Lucy take?**

I do not know exactly. I would envisage 30-45 minutes. It is not usual practice to document time of completing entry.

(c) **Please look at the fax cover sheet for Lucy's Erne Hospital notes at Ref: 061-017-042. The transmission record at the bottom of the page appears to show that transmission was at 09.51 on 13th April. Arising from that-**

(i) **Do you agree that the Erne notes were faxed to the RBHSC on the morning of 13th April 2000 at or about 09.51?**

It would appear so.

(ii) **Explain why you did not have access to the Erne notes when you reviewed Lucy at 10.30.**

I do not know.

(iii) **If you did not have access to the Erne notes at 10.30 when did you first have access to them?**

I am unsure.

(iv) **When did you first read the Erne notes relating to Lucy?**

See (iii)

(v) **Did Dr Crean speak to you about Lucy before you reviewed her. If so, please provide details of your discussion with Dr Crean.**

I cannot recall

(7) *"Her parents rang the Contactors and she was seen by an out-of- hours doctor , who referred her to Erne Hospital, with her arriving there at approximately 19.30 hours. According to Dr O'Donohoe's letter a this stage, IV placement was achieved three hours later. Her initial sodium was 137and her potassium was 4.1. She was given 18.(0.18%NaCL and 4% dextrose). According to her fluid balance chart , she was given 100 mls an hour of this once IV placement was achieved."*[Ref: 013-031-112]

(a) **What was the source of your information that Lucy was given 0.18 NaCL and 4% dextrose ("Solution No.18")?**

Fluid balance chart from the Erne (11pm → 3am)

(b) **When did you first become aware of that information?**

Presumably when I saw the fluid balance chart (or copy thereof). I cannot recall exactly when.

(c) **When did you first read the fluid balance chart?**

I cannot recall.

(d) **Did you give consideration at any time to the appropriateness or otherwise of administering 100mls an hour of Solution No.18 to a child of Lucy's age, weight, and condition, and/or whether it could have caused or contributed to her collapse?**

I have not specifically documented my concern in that regard.

If so-

(i) **State when you considered that issue.**

(ii) **Detail the consideration which you gave to that issue.**

(iii) **State the conclusions you reached and the reasons for them.**

(iv) **State whether you discussed the issue or your conclusions with anyone and if so with whom and when.**

If you did not consider this issue, explain why you did not.

(8) *"At 11pm, she was noted to be staring somewhat with her eyes quite glazed. At approximately 3am, she was restless with some abnormal breathing and then she went quite rigid. At that stage, she had some offensive diarrhoea and it was noted that her pupils were fixed and dilated. She was intubated by an anaesthetist and approximately at that stage, her sodium was found to have dropped to 127. She was given what appears to be a large bolus dose (500 mls) of normal saline (0.9)."[Ref: 013-031-112]*

(a) **What was the source of your information that Lucy's sodium was found to have dropped to 127 at approximately the stage of intubation?**

See page 061-017-047 and page 061-018-060

(b) **When did you first become aware of that information?**

When completing my note of 13/04/2000

(c) **Did you at any time consider what had caused the drop in Lucy's sodium from 137 on admission to the Erne to 127 at approximately the stage of intubation?**

I may not have. 127 represents only mild hyponatraemia

If so-

(i) **State when you considered that issue.**

(ii) **Detail the consideration which you gave to the issue .**

(iii) **State the conclusions you reached and why you reached them.**

(iv) **State whether you discussed the issue or your conclusions with anyone, and if so, with whom, and when.**

If you did not consider this issue explain why you did not.

A sodium level of 127, while below the normal range, is not markedly reduced.

(d) **What was the source of your information that Lucy was given a large bolus dose (500mls) of normal saline?**

Presumably the copy of the fluid balance chart

(e) **When did you first become aware of that information?**

I cannot remember It is recorded on the fluid balance sheet 061-017-056

(f) **Did you at any time consider the appropriateness or otherwise of administering a large bolus dose (500 mls) of normal saline to a child of Lucy's age , weight, and condition, and/or whether that could have caused, or contributed to, or exacerbated, her condition?**

No

If so-

(i) **State when you considered that issue.**

(ii) **Detail the consideration which you gave to the issue.**

(iii) **State the conclusions you reached and why you reached them.**

(iv) **State whether you discussed the issue or your conclusions with anyone else, and if so, with whom and when.**

If you did not consider that issue, explain why you did not.

The saline bolus was given after her acute collapse, when I believe she coned.

(9) *"Not having access to her fluid balance chart at that stage, my differential diagnosis included infection, possibly from herpes, haemorrhagic shock, encephalopathy, metabolic disease, including urea cycle defect from other cause. Various investigations were all normal and subsequent events transpired to indicate that cerebral oedema, probably related to hyponatraemia, in turn to a gastroenteritis, was the cause of death."* **[Ref: 013-031-113]**

(a) **Please look at the RBHSC copy of the Erne Hospital fluid balance chart [Ref: 061-017-056]. There is a record at the top of that page of fax transmission at 08.53 on the 13th April, and at the bottom of the page there is a record of fax transmission at 09.51 on the 13th April. Having regard to this, explain how you did not have access to the fluid balance sheet when you saw Lucy at 10.30.**

I cannot recall

(b) **If you did not have access to the fluid balance chart when you reviewed Lucy's case at 10.30, when did you first have access to it?**

I cannot remember exactly.

(c) **When did you first read the fluid balance chart?**

See (b)

(d) **Did you re-evaluate your differential diagnosis after you read the fluid balance chart? If you did, please detail your re-evaluation. If you did not, explain why you did not.**

No. I have not documented a change in the differential diagnosis so I presume not

(e) **Identify each of the *"various investigations"* to which you refer.**

Amino acids and organic acids in urine; Toxicology screen;Ammonia;Liver function tests; Blood culture;Virology screen;Urinalysis

(f) **From the results of the investigations were you able to exclude any of the possibilities in your differential diagnosis,? If so-**

(i) **Identify which possibilities you were able to exclude.** Aminoacidopathy;Organic aciduria;Toxin ingestion;urea cycle defect; septicaemia;infection with mumps, measles, herpes simplex virus,varicella, cytomegalovirus;Urinary tract infection

(ii) **Explain how you were able to exclude them.** The normal amino acid profile in urine would not support an aminoacidopathy; The normal organic acids would not support an organic aciduria; the negative toxicology screen would not suggest an ingestion; the normal ammonia would not suggest a urea cycle defect; the negative virology would not suggest a viral infection. The negative urinalysis would not suggest a urinary trract infection. The normal, or near-normal (AST was mildly elevated at 71, range 10-40) liver function tests would not suggest liver failure as part of multiorgan failure in cases oh haemorrhagic shock encephalopathy

(iii) **Did you re-evaluate your differential diagnosis in light of the outcome of the investigations?** No

(g) **Please identify each of the *"subsequent events"* to which you referred and state, in relation to each of those events;**

Publicity surrounding case, television programme, leading to Lucy's inquest

(i) **When did you become aware of it?** Cannot exactly remember.

(ii) **By what means did you become aware of it?** Cannot exactly remember.

(iii) **Did you make anyone else aware of it?** I do not believe so.

(iv) **What consideration did you give to it?** I cannot remember.

(v) **What conclusions did you draw from it?** That the perceived opinion of experts with greater experience than me of fluid balance was that Lucy had died of dilutional hyponatraemia.

(10) *"I reviewed Lucy again that evening at 17.45, and I felt that her prognosis was hopeless. I discussed it with her parents, who were agreeable to her not being actively resuscitated in the event of acute deterioration. I mentioned at that stage that if she succumbed that a post-mortem would be desirable and that the Coroner would have to be informed."*[Ref: 113-031-113]

(a) **Did Lucy's parents express any concerns to you about her treatment in the Erne Hospital?**

I do recall their great upset. They were distressed about difficulty in intravenous line placement but I did not document in writing the exact details of their concern .

(b) State fully the reasons why you considered that a post- mortem would be desirable.

The cause of death was not clear to me.

(c) State fully the reasons why you considered that the Coroner would have to be informed in the event of Lucy's death.

Cause of death was not clear to me. Lucy also had died within a short time of admission to hospital.

(d) Did you consider that there was a legal duty to inform the Coroner in the event of Lucy's death? Please give reasons for your answer.

See (c)

Did you have any guidance to assist you in relation to:

(i) Deciding when a death should be reported to the Coroner

(ii) The information to be given to the Coroner by a doctor reporting a death.

If so, please provide a copy of such guidance.

I cannot remember having access at that time to any written guidance.

(11) *"Earlier that morning Dr Stewart (who was then my registrar) made a note that I contacted Dr. Curtis on behalf of the Coroner's and discussed the case. The Coroner's office advised that a Coroner's post mortem was not required but that a hospital post mortem would be useful to establish the cause of death and rule out other diagnoses. Her parents subsequently consented to post -mortem."* **[Ref: 013-031-113]**

(a) On what date and at what time (approximately) did you discuss the case of Lucy Crawford with Dr Curtis?

14th April 2000. I do not remember the exact time.

(b) What was the purpose of your discussion with Dr Curtis?

As a representative of the coroner's office.

(c) What information did you give Dr Curtis in relation to Lucy's death and the circumstances of her death?

I do not remember the details since I did not document my conversation.

(d) What information or advice, if any, did Dr Curtis give to you?

I do not remember. The note records that he agreed that a post-mortem was desirable.

(e) Did Dr Curtis explain to you why a Coroner's post-mortem was not required? If so, please detail the reasons which he gave you as to why a Coroner's post mortem was not required.

I do not recall the details of our conversation.

(f) **Did you discuss the completion of the death certificate with Dr Curtis and if so what was discussed?**

No

(g) **Did you discuss with Dr Curtis whether a Coroner's Inquest would be held and if so what was discussed?**

No

(h) **Did you speak to Dr Curtis again after this discussion?**

No

If so, please address the following:

(i) **When did the subsequent conversation take place?**

(ii) **What was the purpose of this subsequent conversation?**

(iii) **What was discussed during this subsequent conversation?**

(iv) **Did you take any action on foot of this subsequent conversation?**

(12) **Please look at the statement of Maureen Dennison (Coroner's office) to the PSNI [Ref: 115-033-001]**

"On 14 April 2000 I took the report of the death of Lucy Crawford.... The death was reported to me by Dr D Hanrahan, from ICU at Children's Royal Victoria Hospital. I have written in the circumstances of the death as he reported to me. I spoke to Dr Curtis, Deputy State Pathologist, because I couldn't get in touch with the Coroner, that is why I have written Dr Curtis' name in the entry, it is my writing...." **Arising from this -**

(i) **Do you agree that on the 14th April 2000, you reported Lucy's death to Mrs Dennison in the Coroner's Office?**

Yes

If so, please answer the following questions.

(ii) **At what time on the 14th April (approximately) did you speak to Mrs Dennison?**

I do not recall

(iii) **What information did you provide to Mrs Dennison about the cause of Lucy's death?**

I have no memory of the details. It would appear that the information I gave comprised "gastroenteritis, dehydration, cerebral oedema". See 013-053a-290

(iv) **What information did you provide to her about the circumstances of Lucy's death?** I do not remember.

(v) **Did you discuss the completion of the death certificate with Mrs Dennison? If so, what was discussed?**

No

(vi) **Did you discuss with Mrs Dennison whether a Coroner's inquest would be held and if so what was discussed?**

No

(vii) **Did Mrs Dennison provide any advice or information to you? If so, please give details.**

I do not believe so, beyond suggesting that I talk to Dr Curtis

(b) **Did you have any other discussion with the Coroner's office?**

No

If so, please answer the following:

(i) **When did the discussion with the Coroner's office take place?**

(ii) **What was the purpose of the discussion?**

(iii) **What was discussed during the discussion?**

(iv) **What conclusions were reached?**

(c) **Did you obtain the consent of Lucy's parents for the post mortem to be performed?**

Yes

If so please answer the following:

(i) **Please confirm the date and approximate time at which consent was obtained.** According to Dr Stewart's note in the clinical records, approximately 14.30 on 14 April 2000. See 061-018-068

(ii) **Describe fully the information you provided to the parents about the post-mortem and its purpose.**

I cannot recall

(iii) **Did Lucy's parents raise any issues that they wished to have addressed by the post-mortem?**

I cannot recall

(iv) **Was the consent in writing?**

According to Dr Stewart's note in the clinical records, yes.

(d) **Please look at the autopsy request form completed by Dr Caroline Stewart [Ref: 061-022-073]. Did you provide any advice, direction, or assistance to Dr Stewart regarding the completion of this request? If so provide details of the advice, direction or assistance which you provided.**

I do not remember.

(e) **Did you consider whether or not:**

(i) **To attend personally the autopsy;**

No

(ii) **To delegate one of your clinical team to attend the autopsy?**

No

If so please detail what consideration you gave to the issue and the outcome. If you did not consider this, explain why you did not.

I did not believe it would assist

(f) **Look at page Ref: 061-022-075, the final page of the autopsy request form, where the question *"Will you or a colleague be attending the review session at 1.45pm on the date of the autopsy?"* is answered *"No"*. Did you consider whether or not:**

(i) **To attend personally the review session:**

I do not recall.

(ii) **To delegate one of your clinical team to attend the review session.**

I do not recall

(iii)

If so, please detail what consideration you gave to this issue and the outcome of your consideration. If you did not consider the issue, explain why you did not.

I do not recall

(13) *"Subsequently, Lucy was shown to have been suffering from rotavirus. Her post-mortem showed cerebral oedema and bronchopneumonia. The brain was swollen and showed some signs of early necrosis. The bronchopneumonia was established and was felt to have been present for twenty four hours at least and could have happened, therefore, at Lucy's acute worsening at approximately 3a.m. on 13th April."*[Ref: 013-031-114]

(a) **Identify the information available to you that showed that Lucy was suffering from rotavirus?**

Erne notes 027-011-027

(b) **When did you first become aware that Lucy was suffering from rotavirus?**

I cannot recall when I first saw this information. It is consistent with her gastroenteritic presentation

(c) **Did you consider the provisional anatomical summary provided by Dr O'Hara [Ref: 061-009-033] and dated 17/04/2000? If so please answer the following questions. If you did not consider it, explain why you did not.**

(i) **What exactly did you consider? Please identify the document(s) which you considered.**

I cannot remember.

(ii) **When did you first consider it?**

I cannot recall.

(iii) **Did it assist you in identifying the cause of Lucy's death? Please give reasons for your answer.**

I cannot recall.

(iv) **Did it assist you in identifying the cause of the cerebral oedema which Lucy had suffered? Please give reasons for your answer.**

(v) **Did you discuss the findings with any other person. If so identify the person(s) with whom you discussed the findings and provide details of the discussion.**

I cannot recall

(d) **Insofar as you are aware, when was the autopsy on Lucy performed?**

14th April 2000

(e) **Did you consider the post mortem report provided by Dr O'Hara [Ref: 061-009-016 to 061-009-032] dated 13/06/2000? If so, please answer the following questions. If you did not consider it please explain why you did not.**

I do not recall considering the Post Mortem Report

(i) **What exactly did you consider? Please identify the document(s) which you considered.**

(ii) **When did you first consider it?**

(iii) **Did it assist you in identifying the cause of Lucy's death? Please give reasons for your answer.**

(iv) **Did it assist you in identifying the cause of the cerebral oedema which Lucy had suffered? Please give reasons for your answer.**

(v) **Did you discuss the findings with any other person. If so, identify the person(s) with whom you discussed the findings and provide details of the discussion.**

(f) **Did you at any time discuss the findings of the post-mortem with Dr O'Hara? If so, please give details.**

I do not recall such a discussion

(g) **Did you at any stage consider making a further report of Lucy's death to the Coroner's office? Please give reasons for your answer.**

No

(14) *"Having discussed with the Coroner's Office, I subsequently interviewed her parents on 9th June and I encouraged them to re-attend Dr O'Donohue (sic) to clarify events in the Erne Hospital."*[Ref: 013-031-114]

(a) **What, in your understanding, was the purpose of your interview with Lucy's parents on 9th June?**

I usually write to parents whose children have died offering an appointment to come and see me. I had developed a very good relationship with Lucy's family and wished to do all I could to help them come to terms with their loss.

(b) **Was anyone else (apart from you and Mr and Mrs Crawford) present? If so please identify the other person(s) present?**

I do not remember.

(c) **What questions did Lucy's parents ask you?**

I do not remember exactly.

(d) **Did Lucy's parents express concerns to you about her treatment in the Erne Hospital ? If so, what concerns did they express?**

They were unhappy about her treatment, but I did not document their particular concerns on that occasion so I do not remember.

(e) **What did you tell them?**

I do not remember exactly.

(f) **Why did you encourage them to clarify events in the Erne Hospital with Dr O'Donohoe?**

The sentinel event had occurred in the Erne, when Lucy collapsed. She was brain dead on arrival in Belfast. The events that led to her death, therefore, took place locally, and I believed that Dr O'Donohoe should have been involved in their explanation to Lucy's parents.

(g) **Did you attempt to clarify events at the Erne Hospital:**

I do not recall doing so.

(i) **By reading the notes and records which had been faxed from the Erne; or**

(ii) **By speaking to Dr O'Donohoe, or any other clinician involved in Lucy's care, at the Erne.**

If you did, please give full details.

(h) **Did you have any concerns about events at the Erne Hospital at the time of your interview with Lucy's parents? If you did, please provide full details.**

The fluid management did appear inappropriate, both in the amount of Soln18 administered prior to Lucy's collapse and the size of the bolus of normal saline that she subsequently received. Lucy's cerebral complications were, however, due to

hyponatraemia (secondary to the Soln18), the degree of which I was unaware of at the time.

(i) **Please look at the entry dated 14th June 2000 in the hospital notes [Ref: 061-018-069] where you stated *"Contacted Dr O'Donohoe who will see Lucy's parents again, but he would rather wait for the pm report"* and answer the following questions.**

(i) **Please give full details of this conversation with Dr O'Donohoe. In particular;**

I cannot remember the exact details of the conversation.

(ii) **Did you tell Dr O'Donohoe what questions or concerns Lucy's parents had raised with you? If so, what did you tell him?**

I cannot remember.

(iii) **Did you tell Dr O'Donohoe that a consent post mortem had been carried out? If so, what did you tell him about that?**

I do not remember, but he clearly was aware that a post-mortem examination had been carried out.

(iv) **Did you tell Dr O'Donohoe that Lucy's death had been reported to the Coroner? If so what did you tell him about that?**

I do not remember.

(v) **Did Dr O'Donohoe tell you that the Erne Hospital was conducting an investigation into Lucy's death? If so, what did he tell you?**

I do not remember.

(vi) **Did you tell Dr O'Donohoe that a death certificate had been issued? If so, what did you tell him about that?**

I cannot remember.

(15) *"I am not an expert in fluid management. I accept fluid documentation may have arrived in RBHSC. But I did not see it until 10.30am."[Ref: 013-031-115]*

Is it the position that you did see the fluid balance chart from the Erne Hospital at 10.30am on the 13th April 2000? Please clarify.

I am unclear as to when I saw the fluid balance chart.

III. QUERIES ARISING FROM YOUR STATEMENT TO THE PSNI [115-050-001 TO 115-050-008]

(16) *"I refer to my entry in the Notes where I stated that if the patient succumbed during the night a Post Mortem would be desirable and that the Coroner would have to be informed. I felt that a Post Mortem was desirable as I was not confident as to the cause of death. My uncertainty did not extend to believing that the patient had died an unnatural death but simply that a child presenting with Gastroenteritis should not then have brain oedema without the matter being further investigated."* **[Ref: 115-050-003]**

(a) **How uncertain were you as to the cause of death? Please give details.**

Not having had access to what I now believe to have been full information about Lucy's hyponatraemia, the most important link in the chain of events leading to her cerebral oedema was not evident to me.

(b) **Did you explain fully your uncertainty to Dr Curtis and/or the Coroner's office? Please give details.**

I cannot recall.

(c) **Did you feel able to exclude the possibility that Lucy had died an unnatural death? If so, explain how you were able to do so.**

The reason for her death was not entirely clear.

(17) *"The Clinical History of the Section of the Post Mortem Report would have emanated from an Autopsy Request Form completed by Dr. Caroline Stewart, my Specialist Registrar at the time. Under Clinical Diagnosis it states: Dehydration and Hyponatraemia Cerebral Oedema - acute coning and brain stem death. I would point out that Dr Stewart was my Registrar and placed Hyponatraemia within the Clinical History Section. I believe that Dr Stewart placed hyponatraemia as a clinical feature when filling in the Autopsy Referral Form but this is not the same as implicating it in the chain of events leading to Lucy's death. I delegated the writing of the Autopsy form to her. Whilst I was aware that the Deceased child was Hyponatraemic for a period of time , the significance of this was not apparent to me as the sodium level in the Notes of NA127, having dropped from NA137 did not appear to me to be a marked and significant drop in sodium. One often in Clinical Practice sees a sodium level at 127. At the time I did not believe that this drop in sodium level was sufficient to have caused brain oedema and coning. On reflection and given that there has been some debate over Lucy's death since the Inquest and the calling of a Public Inquiry I believe that the sodium levels were considerably lower than 127 when the patient coned which in retrospect I believe occurred around 3.00 am on the 13th April at Erne Hospital. It appears that the patient was given 500 millilitres of normal saline 0.9% per hour after this event and it was some time after the drip was changed to normal saline when the sodium was re-tested. The resultant sodium levels (showing that 127) was not the alarm bell that it would have* been if it had *been taken at 3.00am when the patient coned. I would stress that this was not something I was (aware of) at the time of my management of the patient and is something that has come to my attention subsequently when at a recent Study Day at the Royal Victoria Hospital I had a brief conversation with Dr. Jarlath O'Donohoe."* **[Ref: 115-050-003 to 115-050-004]**

(a) **Why did you delegate the completion of the autopsy request form to Dr Stewart?**

Dr Stewart was my registrar (i.e an experienced trainee) at the time and it was not inappropriate to delegate this task to her.

(b) **Did you consider whether or not hyponatraemia was implicated in the chain of events leading to Lucy's death? If so please detail your consideration of the issue and the conclusions you reached.**

I cannot recall. Despite the unusual fluid balance, I would not have believed that a sodium level of 127, which is frequently encountered in clinical practice, would have been low enough to lead to cerebral oedema.

(c) **Please look at ref: 061-022-075, the second page of the autopsy request form, and the section which asks *"List Clinical Problems in Order of Importance"*.**

(i) **What is your understanding of the purpose of this section of the form?**

To provide information which might inform the post-mortem process.

(ii) **What is your understanding of why Dr Stewart listed "hyponatraemia" at number (3) in this list?**

Strictly speaking, there was hyponatraemia. 127 is below the normal range, but it is only mildly so.

(iii) **To what extent are the problems listed ((1) vomiting and diarrhoea (2) dehydration (3) hyponatraemia (4) seizure and unresponsiveness leading to brain stem death) an accurate summary of the clinical chain of events leading to Lucy's death as known on 14th April 2000?**

The list is accurate but an essential missing factor is the rehydration with hypotonic fluids.

(d) **In relation to the conversation with Dr O'Donohoe at a Study Day in the Royal Victoria Hospital to which you refer please answer the following questions.**

(i) **What was the date of the conversation?**

I do not exactly recall. Probably the 3rd or the 10th December 2004.

(ii) **Who initiated the conversation?**

I do not remember.

(iii) **Was the conversation pre-arranged? If so, when was it arranged and for what purpose?**

No.

(iv) **Provide full details of the conversation.**

I do not recall the exact details. However I do recall Dr O'Donoghue advising me that the sodium 127 related to blood taken after the bolus of normal saline. See 006-001-112.

(18) *"It may have been felt that a Paediatric Post Mortem would be more helpful than that of a Forensic Pathologist. The pathologist would have the power to request an Inquest if felt to be necessary by referring back to the Coroner"[115-050-004]*

(a) **Was a suggestion made to you, or by you, that a paediatric post mortem would be more helpful than that of a forensic pathologist?**

I do not recall.

If so please answer the following:

(i) **Who made the suggestion ?**

(ii) **When was it made?**

(iii) **Why, in your understanding, was it suggested that a Paediatric Post-Mortem would be more helpful than that of a Forensic Pathologist**

(b) **Was it your understanding that a Coroner's post- mortem could not be conducted by a specialist paediatric pathologist?**

I do not recall.

If so, upon what did you base this understanding?

(19) *"The note of 4th May 2000 is written by Dara O'Donoghue and in relation to the filling out and compiling of the Death Certificate. The Death Certificate was not written until the Post Mortem Report was obtained. He was the Intensive Care fellow. I do not recall the conversation that I had with Dr O'Donoghue and I am therefore relying on the notes in this regard. It would appear from the notes that Dr O'Donoghue spoke to Dr Stewart. It would further appear that the Post Mortem result was on the front of the Chart. It would seem that there was a conversation between Dr O'Donoghue and myself in relation to his liaising with me in relation to what he should put on the death Certificate as the cause of death. It was not uncommon for the more Junior Doctors to write Death Certificates. On looking at the Post Mortem Report I note that it is dated 13th June 2000 and on the first page there is the final Anatomical Summary and the Commentary. On looking at the Hospital Notes and Records Dr O'Donoghue's note is dated 4th May 2000 and thereafter the Funeral Undertaker was provided with a copy of the Death Certificate. I assume that Dr O'Donoghue would have been in possession of the provisional anatomical Summary only. This is dated 17th April 2000. I imagine that Dr O'Donoghue would have discussed with me the content of same where it states history of 24 to 36 hours of vomiting /diarrohea illness with dehydration and drowsiness. History of seizure with pupils fixed and dilated following intubation. Relatively little congestion with some distention of large and small intestine with gas and patchy pulmonary congestion , pulmonary oedema. Swollen brain with generalised oedema...I would have been of the opinion from that that the pulmonary oedema co-existed but was not caused by the brain oedema and I therefore assume that gastroenteritis, dehydration and brain oedema were put on the Death Certificate due to this provisional Anatomical Summary and after Consultation with me. I have considered the final Anatomical Summary which is different in that it states extensive bilateral broncho-pneumonia. I again believe that this co-existed with brain oedema but was not part of the primary chain of events leading to death and this had not been mentioned at the time the Death Certificate was being compiled. The pathologist did not mention Hyponatraemia despite the fact that that was placed in the Clinical History by Dr. Caroline Stewart, my specialist Registrar at the time. It was in my opinion appropriate to draw on the Anatomical Summary for the purposes of the compilation of the Death Certificate."* **[Ref: 115-050-005 to 115-050-006]**

(a) **Did you consider that Dr Dara O'Donoghue was an appropriate person to complete and sign the Death Certificate? Please give reasons for your answer. In particular, state the extent to which , to your knowledge, Dr O'Donoghue had treated Lucy.**

Dr O'Donoghue, was to my knowledge, the clinical fellow in PICU, where Lucy was pronounced dead. Even though he may not have treated Lucy, I did not consider it inappropriate for him to complete the death certificate.

(b) **Did you ask Dr O'Donoghue to complete and sign the Death Certificate?**

I do not remember.

(c) **Why did you not complete and sign the death certificate?** See (a) above

(d) **Were you satisfied, following your conversation with the Coroner's office and/or Dr Curtis that it was appropriate to issue a Death Certificate? Please give your reasons.**

Yes.

(e) **Please look at the statement of Dr O'Donoghue to the PSNI at [Ref: 115-036-003].** ***"In this instance I spoke to Dr Hanrahan. He provided the causes of death, which I duly recorded in the Death Certificate"*** **Do you agree with this statement? Please identify any areas of disagreement.**

I do not remember Dr O'Donoghue seeking my input, although I have no reason to doubt that he spoke with me since he has documented that he did. I cannot recall the advice that I gave him.

(f) **Please look at the Death Certificate at [Ref: 013-008-022]. In relation to the cause of death certified please describe in detail:**

(i) **What consideration you gave to the possible causes of the cerebral oedema?**

I cannot remember my conversation with Dr O'Donoghue , but it is possible that I suggested following the post-mortem report in filling out the death certificate.

(ii) **The factors that led you to conclude that cerebral oedema was due to, or in consequence of, dehydration.**

I cannot remember, but see 19 (f) (i) above.

(iii) **How, in your view, dehydration could have caused the cerebral oedema.**

Cerebral oedema was not due to dehydration, but rather to excessive rehydration leading to hyponatraemia.

And answer the following

(iv) **Did you consider whether cerebral oedema could have been due to, or in consequence of, any other or additional condition or event.**

No.

(v) **If the answer to (iv) above is "yes" what other possibilities or events you considered and how you did you exclude them.**

(vi) **Did you have regard to the notes and records of Lucy's treatment at the Erne Hospital when considering the cause of her death? If so, how did these inform your conclusions as to cause of death. If you did not have regard to them, explain why not.**

The notes were considered. The notes confirmed that she was acutely ill with gastroenteritis.

(vii) **Did you have regard to the clinical diagnosis of hyponatraemia when considering cause of death? If so, how did it inform your conclusions as to cause of death?**

I did have regard to hyponatraemia but considered this to be a mild finding.

(g) **Why was there a delay in the completion of the Death Certificate in respect of Lucy between 14th April 2000 and 4th May 2000?**

I am unsure of the reason.

(h) **Why was the Death Certificate completed after, rather than before, the post-mortem?**

The post-mortem might have shed more light on the cause of death.

(i) **Did you (or insofar as you are aware anyone else in RBHSC) inform the Coroner's office (or Dr Curtis)**

No.

(i) **That a Death Certificate had , or would, be issued; or**

No.

(ii) **The cause of death as certified in the Death Certificate.**

No.

If so, provide details of the information given.

(j) **Did you (or insofar as you are aware anyone in RBHSC) inform the Erne Hospital of the certified cause of death?**

I do not believe that I did.

If so

(i) **Please identify who did so;**

(ii) **To whom at the Erne Hospital was the information conveyed?**

(iii) **When was the information conveyed?**

(k) **Did you (or insofar as you are aware anyone in RBHSC) inform Lucy's GP of the certified cause of death? If so, please identify who did so and when.**

I cannot recall doing so.

IV. OTHER MATTERS

(20) **Did you (or, insofar as you are aware, anyone in RBHSC) write a discharge letter in respect of Lucy to her GP**

I do not believe so.

If so, please confirm the following:

(a) **Provide a copy of the discharge letter;**

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

(21) **Did you (or insofar as you are aware, anyone else in RBHSC) inform anyone in the Erne Hospital that there was not to be a Coroner's post- mortem in relation to Lucy and/or that there was to be a consent post-mortem?**

I do not believe so.

If so, please answer the following:

(a) **What information was provided?**

(b) **When was the information provided?**

(c) **To whom was it provided?**

(d) **If the information was provided in writing, please provide a copy of the document.**

(22) **Did you (or insofar as you are aware, anyone in RBHSC) inform Lucy's GP that there was not to be Coroner's post-mortem in relation to Lucy's death and /or that there was to be a consent post mortem?**

No.

If so please provide the following information:

(a) **What information was provided?**

(b) **When was this information provided?**

(c) **If the information was provided in writing, please provide a copy of the document in which it was provided.**

(d) **If the information was provided in writing, was the information copied to the Erne Hospital?**

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

No.

(24) **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.**

There were regular mortality meetings where attempts were made to discuss the deaths of all children who died in RBHSC. I am unaware of any other processes that applied at that time.

(25) **Was Lucy's death investigated or reviewed under any of the processes set out in your answer at 1 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.**

I believe that Lucy's death was discussed at a mortality meeting.

(26) **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?

To discuss deaths that occurred in the hospital for learning lessons in a non-judgemental fashion.

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

Monthly.

(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?

The intention was that all deaths that took place in the hospital be discussed.

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

I presume that I did, since I was involved in Lucy's case, but I cannot recall the details.

If so:

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

I have no record of this.

(ii) 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.

I cannot remember in detail.

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

I cannot remember in detail.

(iv) 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.

I am unsure. It was the policy at that time not to take minutes.

(v) 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.

I cannot recall.

(vi) **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.**

I cannot recall.

(vii) **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.**

I think Dr O'Hara was at the meeting (it was, and still is, the practice that, if a post-mortem was carried out, the pathologist who performed the autopsy attended the meeting.) I do not believe that he made any further amendments to his opinion expressed in his report.

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

I cannot recall.

(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?**

I presume I would have known

If so please answer the following:

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

I cannot recall.

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

I cannot recall. As mentioned in my answer to 26 (c), it was the intention to discuss all deaths that took place in the hospital.

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

See (e) (ii)

(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.**

I cannot recall.

(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.**

I cannot recall.

(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 believe so.

(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 believe so.

(27) **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 do not know.

(28) **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?**

I cannot recall.

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

(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?**

(29) **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;**

Lucy Crawford undoubtedly died because of cerebral oedema secondary to dilutional hyponatraemia. This entity leads to an osmotic gradient, with fluid diffusing from a dilute compartment (blood) to a relatively concentrated one (brain), leading to swelling. The solid skull does not allow expansion of the brain, so pressure rises adversely, causing coning and, in Lucy's case, death. The primary factor is the severe, rapid, drop in blood sodium levels. I was unaware of the real extent of Lucy's hyponatraemia, the sodium level that was revealed to us having been taken, I believe, following a large bolus of normal (0.9%) saline. The given sodium level of 127 was not low enough, in my opinion, to have resulted in Lucy's decompensation, and hyponatraemia, which was an integral link in the

chain of events which led to Lucy's demise, was not therefore readily identified. Even though misgivings may have been expressed about her intravenous fluid management, it is the drop in sodium, rather than the actual fluids used *per se* (Soln 18 was a widely used intravenous fluid at that time) which renders subsequent events iatrogenic in nature, and therefore unnatural. Not being in possession of the full facts concerning Lucy's actual sodium level made it more difficult to accurately recognise the significance of her care in the Erne hospital.

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

Having discussed with the coroner, I attempted to ensure that Dr O'Donohoe remained involved in follow-up. I do not remember being told that a local investigation was proposed, but this was set in train after Lucy's death.

(c) Lessons learned from Lucy's death;

1. With hindsight, it could be argued that I could have been more rigorous in questioning the timing of the sodium analysis in the Erne. It did not occur to me that it might have been after the normal saline bolus that this took place. If I had questioned this, the real nature of Lucy's death might have become more evident. However, I believe that it was reasonable to assume that the blood was drawn at the time of Lucy's acute collapse, since emergency bloods are typically taken at the time of an acute episode, which her collapse at 3am was.

2. With hindsight, I might have considered re-referral to the coroner. However, it was not made clear to me that this was an option, since a coroner's post-mortem was not felt necessary at the time.

3. The death certificate did not reflect the true chain of events in Lucy's death.I believe, in the absence of information about the real degree of Lucy's hyponatraemia, that I relied too readily on the result of the post-mortem in advising Dr O'Donoghue what to include on the certificate.

(d) Any other relevant matter.

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

Signed: Donncha Hanrahan **Dated:** 1/11/12