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Dr Anderson.
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REPORT

THE REVIEW OF LUCY CRAWFORD'S CASE

CONTENTS

Mr Eugene Fee, Director of Acute Hospital Services

5 July 2000

SPERRIN LAKELAND

HEALTH AND SOCIAL CARE TRUST
ACUTE HOSPITAL SERVICES
TYRONE COUNTY HOSPITAL
[redacted]

MEMORANDUM

TO: Mr T Anderson, Clinical Director for Women & Children's Directorate

FROM: Mr E Fee, Director of Acute Hospital Services

REF: EF/sb

DATE: 5 July 2000

SUBJECT: Lucy Crawford

Trevor, during your period of Annual Leave, Dr Kelly and myself met with Dr Quinn and we also had the opportunity of reviewing the final autopsy report on the late Lucy Crawford.

I have drafted, for your information and use, a report in relation to our review of this case. Please feel free to amend in any way you feel appropriate. I have not had the opportunity to read the draft report when typed.

I know Dr Kelly met with Dr O'Donohoe, on Wednesday 28 June 2000, to give him feedback on our meeting with Dr Quinn. We would suggest that beyond the completion of this report a meeting should be arranged again with the family to give further feedback. This meeting would probably best be attended by yourself, Dr O'Donohoe and Sister Traynor.

I understand that the family, in addition to the meeting held with Dr O'Donohoe, also met with Dr Hanrahan, the Paediatrician in Belfast, and that the final autopsy report was shared with them by Dr O'Hara and Mr Stanley Millar, Western Health and Social Services Council. This meeting, I understand, was held on 16 June 2000.

EUGENE FEE
DIRECTOR OF ACUTE HOSPITAL SERVICES

EF/Complaints2000

SPERRIN LAKELAND
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17 July 2000

Mr E Fee
Director of Acute Hospital Services
Tyrone County Hospital
OMAGH
Co Tyrone

Dear Mr Fee

RE: REVIEW OF LUCY CRAWFORD CASE

Having read through the Review including all of the reports received, I do not have the final report of the Post Mortem and therefore have not seen it. The overall impression gained from reading through all of the reports is of a child who came in with what was thought to be a viral infection or a urinary tract infection. This child was thought to be no sicker than the average patient coming in to the ward and it seems to have come as a major surprise to everyone when there was a sudden deterioration noted at a few minutes before 3 o'clock in the morning. From which point onwards the child never showed any evidence of improvement until eventually determined brain dead.

I found that the report by Dr Quinn, whilst being helpful in the sense that it ruled out any obvious mis-management on the part of our medical/nursing staff at the hospital, was also evidence of the fact that there was no clearly obvious explanation for the child's sudden deterioration.

Certain lessons can be learned from the information that we do have available and the most obvious of these is:

(1) the need for prescribed orders to be clearly documented and signed by the prescriber; and

(2) the importance for standard protocols to be readily available in the ward against which treatment can be compared.

There was also a mistake in the calculation of the ongoing cumulative fluid which the patient received. This would be understandable if it had occurred after the emergency at 3 o'clock but in fact the inaccuracies precede preceed that emergency. There is no obvious indication as to suggest that the nursing staff were under excessive pressure by an excessive workload up to that point. If they were then the staffing of the ward would need to be addressed.

LC - SLT

My further recommendations would be:

(1) That all team members involved in the care of the child on the night in question would probably benefit from a joint meeting and discussion of this report/findings; and

(2) That it would be appropriate for another meeting with the family to appraise them of all of the knowledge and opinions that we have at this point. Whilst we are not in a position to give them definite answers we may at least be able to demonstrate our openness and show to them the measures that have been taken to analyse the care of Lucys admission.

Thanking you.

Yours sincerely

Mr T Anderson, M.B., F.R.C.O.G.
Clinical Director

REPORT RE: THE REVIEW OF LUCY CRAWFORD'S CASE

BACKGROUND

On Friday 14 April 2000 Dr O'Donohoe, Consultant Paediatrician advised Dr Kelly, Medical Director, that 17 month old Lucy Crawford had been admitted to the Children's Ward, Erne Hospital on Wednesday 12 April 2000. She was admitted at around 7.30pm and had deteriorated rapidly early on 13 April 2000 morning. This deterioration in Lucy's condition led to emergency resuscitation within the Paediatric Department, a transfer to the High Dependency Unit, Erne Hospital, and a subsequent transfer to the Royal Belfast Hospital for Sick Children's Intensive Care Unit, where she died.

In light of the unexpected development and outcome of Lucy's condition it was agreed that a review would be established in keeping with the developing arrangements for Review of Clinical Instances/Untoward Events. This review has been conducted by Dr Anderson, Clinical Director, Women & Chilren's Directorate and Mr Fee, Director of Acute Hospital Services with an input from Dr Kelly, Medical Director. External assistance and advice was made available by Dr Quinn, Consultant Paediatrician, Altnagelvin Hospital.

PURPOSE OF REVIEW

The main purpose of the review was to trace the progression of Lucy's illness from her admission to the Erne Hospital and her treatments/interventions in order to try and establish whether:

a) There is any connection between our activities and actions, and the progression and outcome of Lucy's condition
b) Whether or not there was any omission in our actions and treatments which may have influenced the progession and outcome of Lucy's condition
c) Whether or not there are any features of our contribution to care in this case which may suggest the need for change in our approach to the care of patients within the Paediatric Department or wider hospital generally

PROCESS OF REVIEW

1. The case notes were reviewed
2. All staff within Sperrin Lakeland Trust who had an involvement in Lucy's care were asked to provide a written comment/response of their contribution to Lucy's care
3. Some separate discussions were held with Sister Traynor (appendix 11) and Mrs Martin, Infection Control Nurse
4. Dr Quinn, Consultant Paediatrician, Altnagelvin Hospital, was asked to give his opinion on 3 specific issues. A copy of the patient's notes were made available to Dr Quinn
5. The outcome of the postmortem was considered
6. A meeting was held between Dr Kelly, Dr Quinn and Mr Fee on Wednesday 21 June 2000 to share with him the result of the autopsy and seek his comment and a formal response on the issues raised. Dr Quinn's report dated 22 June 2000 is included as appendix 1.

FINDINGS

Lucy Crawford was admitted to the Children's Ward, Erne Hospital on 12 April 2000 at approximately 7.30pm having been referred by her General Practitioner. The history given was one of 2 days fever, vomiting and passing smelly urine. The General Practitioner's impression was that Lucy was possibly suffering from a urinary tract infection. The patient was examined by Dr Malik, Senior House House Officer, Paediatrics, who made a provisional diagnosis of viral illness. She was admitted for investigation and administration of IV fluids. Lucy was considered to be no more or less ill than many children admitted to this department. Neither the postmortem result or the independent medical report on Lucy Crawford, provided by Dr Quinn, can give an absolute explanation as to why Lucy's condition deteriorated rapidly, why she had an event described as a seizure at around 2.55am on 13 April 2000, or why cerebral oedema was present on examination at postmortem.

ISSUES ARISING

1 Level of Fluid Intake

Lucy was given a mixture of oral fluids and intravenous infusion of solution 18 between her admission, at around 7.30pm on 12 April 2000, and the event that happened around 2.55am on 13 April 2000. Dr Quinn is of the view that the intravenous solution used and the total volume of fluid intake, when spread over the 7 ½ hour period, would be within the accepted range and has expressed his surprise if those volumes of fluid could have produced gross cerebral oedema causing coning.

There was no written prescription to define the intended volume. There was some confusion between the Consultant, Senior House Officer and Nurses concerned in relation to the intended volume of fluid to be given intravenously. There is a discrepancy in the running total of the intravenous infusion of solution 18 for the last 2 hours. There is no record of the actual volume of normal saline given when commenced on a free flowing basis.

2 Level of Description of Event

Retrospective notes have been made by nursing and medical staff in respect of the event which happened at around 2.55am on 13 April 2000. In all of these descriptions and the subsequent postmortem report the event is described as a seizure. With the exception of Nurse McCaffrey's report, little detailed descriptions of the event are recorded and no account appears to be in existence of the mother's description who was present and discovered Lucy in this state.

3 Reporting Incident

While a procedure for reporting and the initiation of an investigation into Clinical Instances/Untoward Events was not in existence universally, at the time of Lucy's admission to the Erne Hospital, Dr O'Donohoe proactively reported the unexpected outcome of Lucy's condition to Dr Kelly, Medical Director.

4 Communications

The main communication issue identified within this review was the confusion between all those concerned in relation to the intended prescribed dosage of intravenous fluids. The record shows that Dr O'Donohoe's intention or recollection was that Lucy should have 100mls bolus of fluids in the first hour and 30mls hourly thereafter. While the Nursing staff held a clear view that the expressed intention was to give 100mls hourly until Lucy passed urine. Furthermore this was considered by the Nursing staff interviewed to be a standard approach in such circumstances. This clearly demonstrates the need for standard protocols for treating such patients and the need, in keeping with required practice, to have a clearly written prescription.

5 Documentation

The main issues identified here are the need for clearly documented prescriptions for intravenous fluids, the accurate documentation of the fluid administration, and the need to document patients or parents descriptions of unusual clinical events, such as the seizure, describing the detail which may be required at a later date.

6 Care of Family

Mrs Doherty, Health Visitor, and Dr O'Donohoe were proactive in offering support to the family and given the opportunity to explain where possible the reasons for the change in Lucy's condition and support them in their bereavement.

7 Team Support

All team members involved in Lucy's care were shocked and traumatised by the unexpected deterioration in her condition. A team briefing consisting of all disciplines did not take place. Such a process may help support those concerned and reduce the fear of attempts to apportion blame between team members.

8 Linkage with the Regional Centre

A number of issues arose in respect of our link with Regional Services in this case. These included the arrangements to support the transfer of such patients, the need for greater communication between the local hospital and the regional hospital in respect of feedback which is to be given to parents in such instances and the significant time delay in getting access to the final postmortem report.

9 Recommendations

a) the need for prescribed orders to be clearly documented and signed by the prescriber

b) the importance for standard protocols to be readily available in the ward against which treatment can be compared

c) that all team members involved in the care of the child, on the night in question, would probably benefit from a joint meeting and discussion of this report/findings; and

d) that it would be appropriate for another meeting with the family to appraise them of all of the knowledge and opinions that we have at this point. Whilst we are not in a position to give them definite answers we may at least be able to demonstrate our openness and show to them the measures that have been taken to analyse the care of Lucy's admission.

31 July 2000

Appendices

1. Medical Report
2. Newspaper Coverage
3. Reference Material – Rota Viral Enteritis
4. Nurse McCaffrey's Report
5. Mr Fee's notes of Feedback from Dr Quinn
6. Draft Setting Out Review
7. Nurse McNeill's Report
8. Dr Malik's Report
9. Nurse Swift's Report
10. Dr O'Donohoe's Report & Copy of PM
11. Mr Fee's notes Following Meeting with Sister Traynor and Nurse Swift on 27/4/00
12. Letter to Dr Quinn
13. Notes re Telephone Conversation with Mrs Doherty, Health Visitor, on 21/4/00
14. Letter to Nursing Staff
15. Off Duty's
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17. Diary Entry
18. Nurse McManus' Letter
19. Dr Auterson's Report
20. Nurse Jones' Letter
21. Sequence of Events
22. Emergency Admissions Policy

Appendix 1

DATE: 22 June 2000

Mr Eugene Fee
Director of Acute Hospital Services
Sperrin Lakeland Trust
Tyrone County Hospital
OMAGH
BT79 0AP

Dear Mr Fee

Medical Report on Lucy Crawford

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.

Lucy had been admitted on 12.4.00 at around 19.30hours. Her G.P's letter stated that she had been pyrexic, not responding to Calpol, that she was drowsy and lethargic, that she was floppy and not drinking. He noted her temperature to be 38 C and wondered if she could possibly have a urinary tract infection. On admission the history revealed that the fever had been going for 36 hours and indeed that she had been vomiting for a similar period of time. She had been off her feeds to an extent of 5 days and that she was drowsy for about 12 hours. Her stools were reported to be normal. She had a temperature of 38 C on admission and was noted to be 9.14kgs. This would be around the 2nd centile for her age. Her capillary refill time was said to be > 2 seconds. Her abdomen was soft and bowel sounds were present. A diagnosis of viral illness was made.

Her urines were checked. A blood count revealed a somewhat raised WCC at 15 with 13000 of these being neutrophils. Urea & electrolytes were essentially normal apart from a raised urea at 9.9. It is reported that the taking of oral fluids by the child should be encouraged. An intravenous line was inserted at 23.00hours 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 about 150mls prior to this. At around 02.30hours the child passed a very large runny bowel motion and was transferred into a side room. At around 02.55hours of 13.4.00 the mother buzzed a nurse to say that the child was rigid. When the nurse saw the child she confirmed that it was rigid in the mother's arms and called a second nurse at around 0.300hours. Lucy's colour was recorded as being satisfactory and

LC - SLT

033-102-270

her respirations were satisfactory. A junior doctor was bleeped at that stage and the child was turned on her side and given some oxygen. 2.5mgs of Diazepam was administered rectally. However it is recorded that within one minute of this a large bowel motion occurred and I suspect most of the Diazepam was expelled. 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 03.20hours 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 in the Erne Hospital and ventilated in a high percent of oxygen. Mannitol 20% was given and intravenous Claforan.

At 06.30hours she was transferred to the Royal Belfast Hospital for Sick Children's ICU and I understand that she subsequently died.

I have subsequently been made aware that the Pathologist reported that the child had a significant pneumonia and cerebral oedema.

I will attempt to answer a few questions which obviously came up from reviewing the notes.

Why was the child noted to be floppy in the first place?

I suspect she may well have been quite ill on admission. The raised WCC with a predominance of neutrophils may go along with a bacterial infection and could have been due to the pneumonia which was found on P.M. However as stated before this is speculation.

Was the child dehydrated on admission?

I think the urea measurement of 9.9 on admission does indicate a degree of dehydration. This level of urea would certainly not go with renal failure.

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 3.00a.m. when she had the possible seizure she got a total of 550mls. This would include 150mls oral and 400mls 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

Altnagelvin Area Hospital, Glenshane Road, Londonderry BT47 6SB

have calculated the rates 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.

Was there evidence of renal compromise?

I have noted that there was a urinary output and that there was no oedema of the face or peripheries noted. Ward testing of the urine showed some protein and ketones. However lab testing did not confirm proteinuria. The ketones would certainly be present in any child who is not eating well or indeed is vomiting.

Did the child have a seizure or did she "cone" at 3.00a.m?

I feel it is very difficult to say what happened in and around this time. It is certainly possible that she had a seizure and may even have had a period of time when she was hypoxic before medical attention was drawn to the fact she was unwell. However I cannot say that this is the case. It may be that mother informed the ward staff immediately she noted the problem but again this is not clear to me from the notes provided.

Apnoea.

This could have occurred as the result of a seizure. It could have occurred as a result of coning. I have looked at the possibility that it could have been due to medication with rectal Diazepam. I note the child was given 2.5mgs but it was stated that within one minute of administration of this she had a large bowel motion and I presume most of the Diazepam actually came out. Certainly the recommended dose of Diazepam that can be given to a child who is seizing is 500mcg/kg. Therefore she could have been given up to 4.5mgs and certainly 2.5mgs given rectally to this age of child for a seizure would be appropriate. I am aware that some child have idiosyncratic reactions to Diazepam but normally this would be if they are given by the intravenous route and these events are very rare.

Lucy Crawford

Was the resuscitation adequate?

The notes state that the child had a good heart rate and colour throughout this event and that initially the child's respirations were adequate. Obviously when she became apnoeic in and around 03.20hours she required an airway insertion and bagging and she was ultimately then intubated by an Anaesthetist. 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 that time but if it was suspected that she was shocked then perhaps up to 20mls/kg could have been given.

I hope these comments are helpful. I find it difficult to be totally certain as to what occurred to Lucy in and around 3.00a.m. 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. However I hope I have attempted to be as objective as possible with the information available to me.

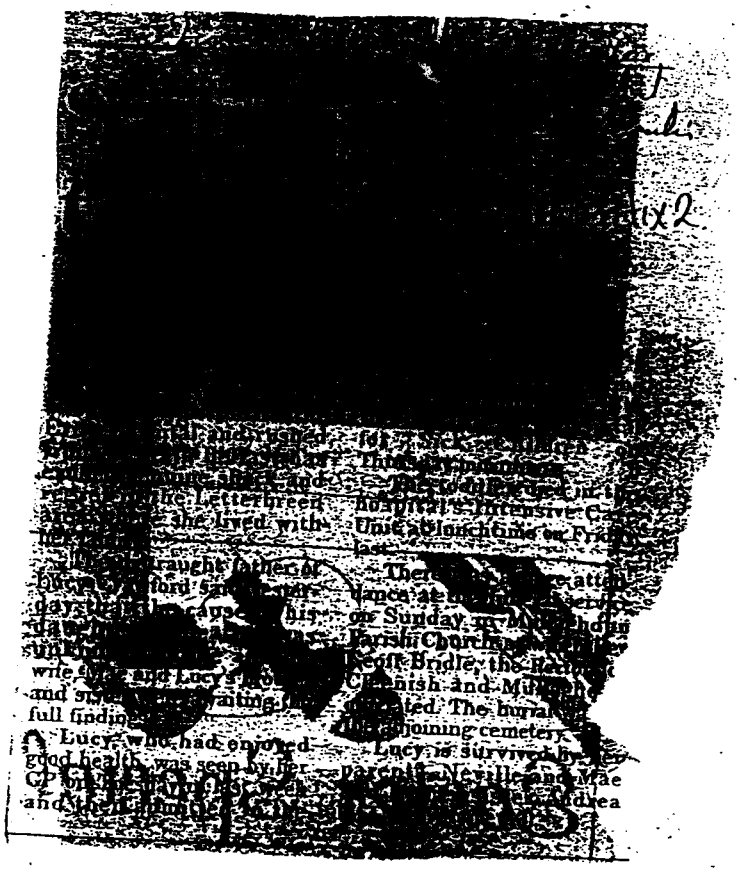
Yours sincerely

R J M QUINN, MB, FRCP, DCH, MFPaedRCPI
Consultant Paediatrician

LC - SLT

Altnagelvin Area Hospital, Glenshane Road, Londonderry BT47 6SB

Appendix 2



Lucy, who had enjoyed good health, was seen earlier

Lucy is survived by

Parents Neville and Mae

LC - SLT

B., C., and D. Control of patient, contacts and the immediate environment; Epidemic measures; and Disaster implications: See Staphylococcal food poisoning (19B, C and D, above).

E. International measures: None.

GASTROENTERITIS, ACUTE VIRAL ICD-9 078

Viral gastroenteritis presents as a sporadic or epidemic illness in infants, children and adults. Several enteropathogenic viruses (rotaviruses and, less commonly, enteric adenoviruses, caliciviruses and astroviruses) affect mainly infants and young children as a diarrheal illness which may be severe enough to produce dehydration requiring hospitalization. Other non-cultivable enteric viruses (Norwalk agent and Norwalk-like viruses) affect primarily older children and adults and cause self-limited sporadic gastroenteritis or outbreaks in families, institutions and communities. The epidemiology, natural history and clinical expression of enteric viral infections are best understood for group A rotavirus in infants and Norwalk agent in adults.

I. ROTAVIRAL ENTERITIS ICD-9 008.8

(Sporadic viral gastroenteritis, Severe viral gastroenteritis of infants and children, Non-bacterial gastroenteritis of infancy)

1. Identification—A sporadic or seasonal, often severe gastroenteritis of infants and young children characterized by fever and vomiting, followed by a watery diarrhea occasionally associated with severe dehydration and death in the young age group. Secondary symptomatic cases among adult family contacts are infrequent, although subclinical infections occur frequently. Rotavirus infection has occasionally been found in pediatric patients with a variety of clinical manifestations, but the virus is probably coincidental rather than causative in these conditions. Rotavirus is a major cause of nosocomial diarrhea of newborns and infants. In any single patient, illness caused by rotavirus is not distinguishable from that caused by other enteric viruses, although rotavirus diarrhea may be more severe, and is more frequently associated with fever and vomiting than is acute diarrhea due to other agents.

Rotavirus is identified in stool or rectal swab by EM, ELISA, LA and other immunologic techniques for which commercial kits are available. Evidence of rotavirus infection can be demonstrated by serologic techniques but diagnosis is usually based on the demonstration of rotavirus antigen in stools.

Appendix 3

2. Infectious agent—The 70-nm rotavirus belongs to the Reoviridae family. Group A is common, group B is uncommon in infants but has caused large epidemics in adults in China, while group C is rare in humans; groups B, C and D occur in animals. There are 4 major serotypes of group A human rotavirus, based on antigenic differences in the VP7 surface protein, the major neutralization antigen. Another surface protein, designated VP4, is associated with virulence and also plays a role in virus neutralization.

3. Occurrence—In both developed and developing countries, rotavirus is associated with about one-third of the hospitalized cases of diarrheal illness in infants and young children less than 5 years of age. All children are infected in their first 3-4 years of life, and most first infections after the first month of life are associated with diarrhea. Rotavirus is more frequently associated with severe diarrhea than are other enteric pathogens. In developing countries, it is responsible for an estimated 870,000 diarrheal deaths each year.

In temperate climates, it occurs almost exclusively in the cooler months; in tropical climates, throughout the year and with less pronounced peaks. Neonatal infections are frequent in certain settings but are usually asymptomatic. Infection of adults is usually subclinical; outbreaks of clinical disease occur in geriatric units. Rotavirus has caused travelers' diarrhea in adults, diarrhea in immunocompromised (and AIDS) patients, among parents of children with rotavirus diarrhea, in the elderly and among children in day-care settings.

4. Reservoir—Probably man. The pathogenicity of animal viruses for man has not been found when searched for, except for group B and group C rotaviruses which may be primarily animal rotaviruses.

5. Mode of transmission—Probably fecal-oral and possibly fecal-respiratory. Although rotaviruses do not effectively multiply in the respiratory tract, they may be swallowed with respiratory secretions.

6. Incubation period—Approximately 24 to 72 hours.

7. Period of communicability—During acute stage of disease, and later while virus shedding continues. Rotavirus is not usually detectable after about the eighth day of illness, although excretion of virus for ≥ 30 days has been reported in immunocompromised patients. Symptoms last for an average of 4-6 days.

8. Susceptibility and resistance—Susceptibility is greatest between 6 and 24 months of age. By age 3, most individuals have acquired rotavirus antibody. Immunocompromised infants are at particular risk for prolonged rotavirus diarrhea.

9. Methods of control—

A. *Preventive measures:*

1) Undetermined. Hygienic measures applicable to di
transmitted via fecal-oral route may not be effect
preventing transmission.

2) Prevent exposure of infants and young children to
viduals with acute gastroenteritis in family and in
tional (day-care or hospital) settings.

3) Passive immunization by oral administration of IG
been shown to protect low-birth-weight neonates. Bi
feeding does not affect infection rates, but may reduc
severity of the gastroenteritis. Studies are under wa
the efficacy of attenuated rotavirus as an orally adm
tered vaccine.

B. *Control of patient, contacts and the immediate environm*

1) Report to local health authority: Obligatory repor
epidemics; no individual case report, Class 4 (see Prefa

2) Isolation: Enteric precautions, with frequent handwash
by caretakers of infants.

3) Concurrent disinfection: Sanitary disposal of diapers,

4) Quarantine: None.

5) Immunization of contacts: None.

6) Investigation of contacts and source of infection: Sou
of infection should be sought, especially in the home
institutions.

7) Specific treatment: None. Oral rehydration therapy wi
oral glucose-electrolyte solution is adequate in mo
cases. Parenteral fluids are needed in cases with vascul
collapse or uncontrolled vomiting (see Cholera, 9B7).

C. *Epidemic measures:* Search for vehicles of transmission an
source on epidemiologic bases.

D. *Disaster implications:* A potential problem.

E. *International measures:* WHO Collaborating Centres (see
Preface).

II. EPIDEMIC VIRAL GASTROENTEROPATHY

ICD-9 078.8, 078.82

(Viral gastroenteritis in adults, Epidemic viral gastroenteritis, Norwalk type disease, Acute infectious nonbacterial gastroenteritis, Viral diarrhea, Epidemic diarrhea and vomiting, Winter vomiting disease, Epidemic nausea and vomiting)

1. Identification—Usually a self-limited, mild to moderate diseas often occurs in outbreaks, with clinical symptoms of nausea, vomit- diarrhea, abdominal pain, myalgia, headache, malaise, low-grade er, or a combination of these symptoms. Gastrointestinal symptoms cteristically last 24-48 hours.
The virus may be identified in stools of ill individuals by IEM or, for the rwalk virus, also by RIA. Serologic evidence of infection may be monstrated by IEM or, for the Norwalk virus, by RIA. Diagnosis quires collection of a large volume of stool, with aliquots stored at 4°C F) for EM, and at -20°C (-4°F) for antigen assays. Acute and nvalescent sera (3-4 week interval) are essential to link particles bserved by IEM with disease etiology.

2. Infectious agents—The small, 27-32-nm Norwalk virus, an atypi- al calicivirus, has been implicated as the etiologic agent in about ne-third of the nonbacterial gastroenteritis outbreaks. Other agents that re morphologically similar, but antigenically distinct, have been associ- ted with gastroenteritis outbreaks. These include Hawaii, Ditchling or , Cockle, Parramatta, Snow Mountain agents and the Marin County gent (an astrovirus). Outbreaks have also been associated with adenovi- ruses (types 40, 41 and probably 31), several types of astroviruses and 20-35-nm caliciviruses, the 33-39-nm Sapporo agent, the similar Orofuke agent, parvoviruses and coronaviruses. With the exception of the enteric adenoviruses, some astroviruses and caliciviruses, the role of these agents as a cause of severe diarrhea of infants and young children is unclear.

3. Occurrence—Worldwide and common; most often in outbreaks but also sporadically affecting all age groups. In a study in the USA, antibodies to Norwalk agent were acquired slowly; by the fifth decade of life, >60% of the population had antibodies. In most developing countries studied, antibodies are acquired much earlier. Seroresponse to Norwalk virus was detected in infants and young children in Bangladesh; this agent was associated with 1-2% of diarrhea episodes.

4. Reservoir—Man is the only known reservoir.

5. Mode of transmission—Unknown; probably by fecal-oral route principally, although airborne transmission from fomites has been sug- gested to explain the rapid spread in hospital settings. Several recent outbreaks have strongly suggested primary community foodborne and waterborne transmission, with secondary transmission to family members.

6. Incubation period—Twenty-four to 48 hours; in volunteer studies with Norwalk agent, the range was 10-50 hours.

7. Period of communicability—During acute stage of disease and up to 48 hours after Norwalk diarrhea stops.

Appendix 4

27.4.00 - Mr Tee.
Enclosed please find a factual account of the sequence of events in relation to Lucy Crawford's care, where I was involved.

JW Collins.

I am an Enrolled Nurse working on Childrens Ward, Exne Hospital. I met Lucy Crawford and her parents following our handover from the day staff.

I was giving out the evening suppers at 8.30p.m. I offered Mr & Mrs Crawford a cup of tea and a drink of juice for Lucy. I went on with my trolley to give supper to the rest of the children on the ward.

I really had very little to do with Lucy until Mrs Crawford 'buzzed' in Cubicle 6 at 2.20 a.m. Lucy had a dirty nappy, some had got on the sheets, so Mum changed the nappy and I changed the sheets. The nappy was very foul smelling, the large nappy was very runny & very yellow in colour, it was very offensive.

At that SR. Edmondson arrived into Cubicle 6, she commented on the smell, then she spoke to Mrs Crawford.

Mother settled Lucy down, she gave me a little glance, but Mum said she was very tired. Mum then got into bed

I put the nappy into the sluice room went & reported the nappy to SN McMan she advised me to move Lucy and her a sideward.

2.30 am. I returned to Cubicle 6 and to Mrs Crawford, that she would be be off in a sideroom when she had dre Mrs Crawford agreed and herself and I the cot & Lucy & the IV fluids up the to sideward No. 10. I moved the bed room over, so that I could put the c I went back down the ward and brough their belongings. Mum settled Lucy do then got into bed herself. I assured Mr that we would be popping in and out to on Lucy thraught the night, but if sh so she could 'buzz' and I showed her to push the buzzer.

2.40 am I went to the treatment room, g blue t bottles, went to the sluice room scoped

Wednesday 12/4/05

Night Duty.

LC - SLT

7.45 — Report.

Told by S/N Mc Dowell of Lucy Crawford admission.

8.20 Approx: — Went to treatment room Inside was S/N M Burns Dr Malik Mr & Mrs Crawford Lucy. I introduced myself to the parents and S/N Burns left. Dr Malik found a small vein in Lucy's (L) foot and inserted a venflon He obtained a blood sample and flushed the venflon will Heplock at this time the vein collapsed it was then removed as it was not acceptable for I.V. fluids access.

I remained in the treatment room with Mrs Crawford and Lucy as Dr Malik went to phone Dr O' Donovan and asked him to come to the ward. Lucy was given orange juice in a cup Approx 8am. Lucy passed urine into a specimen bag and a sample was tested by myself which had protein and ketones. The rest of the urine was placed into a white top container and was left ready to be send to the Lab. I chose Lucy temp. and it was still high so I gave her 1/2 Paracetamol 120 mgs in the presence of her Mother. Dr O' Donovan came to the ward - He requested Elma Cream be applied to both Lucy's hands which I did. While we waited for the Cream to work I made up a drink of Dioralyte and gave Lucy 100 mls which she drank. She asked for her dummy which her Mother gave her

Appendix 9.

Mr. Fee.

Enclosed is my account of what happened on the night of the 12th April I hope it is of some help to you

S/L D Swift
Children Ward.

Appendix 8

SPERRIN LAKELAND
HEALTH AND SOCIAL CARE TRUST

ERNE HOSPITAL
ENNISKILLEN, CO. FERMANAGH. BT74 6AY. TELEPHONE [redacted] FACSIMILE [redacted]

5 May 2000

RECEIVED
05 MAY 2000

CONFIDENTIAL

Mrs E Miller
Clinical Services Manager
Erne Hospital
ENNISKILLEN
BT74 6AY

Dear Mrs Miller

Re: Lucy Crawford DOB: 05/11/98 [redacted] ERN: 123000

I saw Lucy at the request of her General Practitioner on 12 April 2000 at 1930 with a 2 day history of fever, vomiting and passing of smelly urine. The General Practitioner's impression was that Lucy was suffering from query UTI and needed intravenous fluids.

I took a detailed history, examined the patient and made the provisional diagnosis of viral illness. I admitted her for investigations and administration of intravenous fluids. I did manage to take bloods for FBC and U&E but could not insert intravenous cannula so I called Dr O'Donohoe around 2100 for his advice regarding management of the patient. When Dr O'Donohoe arrived I gave him my clinical findings regarding this patient. While he was managing the patient I was called away to see another emergency admission. I saw 3 patients at the request of General Practitioners and finished my last admission at 0130.

I received a bleep from Children's ward at 0258 (13/4/00) saying that Lucy had become unwell. I went straight away to the ward and was informed by a nurse that Lucy was having a fit. When I examined her she was having a tonic fit with twitching of the fingers on both her hands. She was afebrile and breathing spontaneously, peripheral pulses were present and chest was clear. I told the nurse to give 2.5 mgs of Diazepam rectally. In the meantime Dr O'Donohoe was contacted by one of the Nursing Staff and I went to the nurses' station to talk to him on the telephone. I briefed him about Lucy's latest condition and he told me that he was on his way. I went back to Lucy's room and the nurse told me that Lucy had passed foul smelling loose motions within a couple of minutes of giving the Diazepam suppository. At that time Lucy's respiration became difficult and she stopped breathing. I felt her brachial pulse which was present. I started bagging her effectively. I asked the nurses to attach cardiac as well as pulse oximeter monitor. Within 2-3 minutes of institution of respiratory support Dr O'Donohoe arrived and took over the management.

LC - SLT

SPERRIN LAKELAND
HEALTH AND SOCIAL CARE TRUST

ERNE HOSPITAL
ENNISKILLEN, CO. FERMANAGH. BT74 6AY. TELEPHONE [redacted] FACSIMILE [redacted]

Lucy was intubated by the Consultant Anaesthetist and was moved to ICU at 0445, with a view to be transferred to Paediatric ICU at Royal Belfast Hospital for Sick Children by Dr O'Donohoe.

Yours sincerely

Dr A Malik
SHO in Paediatrics

cc Dr T Anderson, Clinical Director for Obs/Gynae/Paeds

LC - SLT

Erne Hospital
Night Duty – 7.45pm 12 April 2000 – 8.00am 13 April 2000

At approximately 4.00am on 13 April 2000, a Staff Nurse from Children's Ward made a request for the drug Annexate, which I brought, prepared and checked with Dr Auterson.

I then assisted Staff Nurse T Jones to insert a urinary catheter. I attended to Lucy's personal hygiene prior to catherisation.

At approximately 4.20am I returned to Ward 5 to prepare for Lucy's transfer to Intensive Care Unit, Erne.

Lucy arrived to Ward 5 at 4.40am with Dr Auterson, Dr O'Donohoe and Staff Nurse T Jones. Dr Auterson commenced Lucy on the Puritain Bennett 7200A Ventilator.

I commenced ECG monitoring, applied Blood Pressure Cuff and recorded same. I checked her level of consciousness and recorded her Glascow Coma Scale. I also checked pupil size and reaction, and applied oxygen saturation probe to Lucy's toe. I monitored and recorded these vital signs during Lucy's stay in Intensive Care, Erne.

Dr O'Donohoe prescribed Monitol 20% (25mls) over 30 minutes. I infused same via a syringe pump. Intravenous fluid of normal saline 0.9% were infused via a Buritol Infusor at 30mls/hr.

Dr Auterson re-intubated Lucy with a Naso-tracheal tube, and I assisted him with intubation and with insertion of an arterial line, and Naso-gastric tube.

Lucy was transferred to the ambulance stretcher in preparation for transfer to the Royal Belfast Hospital for Sick Children using the Children's Ward transport monitor to record ECG, non-evasive blood pressure and Oxygen saturation levels. Ventilation was continued manually by Dr O'Donohoe.

Dr Auterson checked Lucy's condition in the ambulance. Dr O'Donohoe and myself accompanied Lucy and we left the Erne Hospital at 6.30am.

During the journey manual ventilation was continued alternating with Dr O'Donohoe and myself.

I observed and recorded Lucy's ECG rhythm, non-evasive blood pressure and Oxygen saturation levels throughout the journey. These were recorded on the back of the transfer sheet.

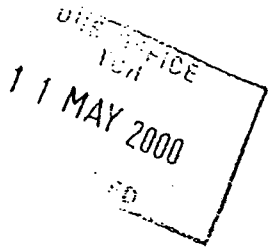
During the journey Lucy became hypotensive. Dr O'Donohoe instructed me to infuse Dopamine via syringe pump at 1ml- 1-5ml/hr.

We arrived at Royal Belfast Hospital for Sick Children at 8.10am.

Lucy was moved from the ambulance to the Paediatric Intensive Care Unit, where I gave the Staff Nurse a report on Lucy's condition.

LC - SLT

Appendix 7



27 April 2000

Mr E Fee
Director of Acute Hospital Services
Tyrone County Hospital
OMAGH
Co Tyrone

Dear Mr Fee

Re: Lucy Crawford (Deceased)

Please find enclosed an account of the events in relation to Lucy's care, where I was involved.

Yours sincerely

Siobhan Mac Neill.

Siobhan MacNeill
STAFF NURSE

Enc

LC - SLT

EF/Complt

Appendix 6

Acute Hospital Services

DRAFT

Re: Lucy Crawford (deceased)

On Friday 14 April 2000 Dr O'Donohoe, Consultant Paediatrician, advised Dr Kelly, Medical Director that 17 month old Lucy, who was admitted to the Children's Ward, Erne Hospital on Wednesday, 12 April 2000, evening, had deteriorated rapidly early on 13 April morning had been transferred to the Royal Belfast Hospital for Sick Children's Intensive Unit and was, at the stage of his report to Dr Kelly, declared brain dead.

Dr Kelly advised Mr Mills, Chief Execuitve and Mr Fee, Director of Acute Hospital Services by telephone and requested that Mr Fee consider establishing a review of Lucy's care at the Erne Hospital.

Mr Fee spoke to Dr Anderson, Clinical Director, Women and Children's Directorate, at 1.00pm and it was agreed that they would jointly co-ordinate this review.

It was confirmed on Monday 17 April 2000 that Lucy Crawford had died in hospital, in Belfast and the funeral was held Sunday 19 April 2000. Between Monday/Tuesday 17/18 April Dr Anderson and Mr Fee met with Dr O'Donohoe, Dr Malik, Sister Edmunson, S/N McManus, E/N McCaffrey and S/N McNeill to offer them support and to advise them of our intent to conduct a review.

On Wednesday 19 April Dr Anderson and Mr Fee met to review the case notes and agreed the following Action Plan:-

1) That staff listed above and Dr Auterson, Consultant Anaesthetist, would be asked to provide a factual account of the sequence of events from their perspective.

2) That the case notes/copy of case notes would be made available for reference to those concerned. Dr Anderson agreed to get a copy of the case notes made and have both the copy and the original retained in Mrs Millar's office for the immediate future.

3) Dr Anderson is to speak to Dr O'Donohoe and request that he share with staff concerned, in confidence, the verbal report of the cause of death received.

LC - SLT

4) Mr Fee is to seek an appropriate method of advising Lucy's parents that we will arrange an opportunity to share with them information on the nature of Lucy's illness, the treatment given, and the cause of death, addressing where possible, any questions they have, when we have established the necessary information and facts

Mr Fee will speak to Ms Murphy, Health Visitor Manager, to establish what support is being given to the family and if it is possible to make this offer through the Health Visiting Service.

5) Mr Fee is to establish, from the Infection Control Service, the nature of ROTA Virus infection.

6) It was agreed that Dr Anderson and Mr Fee would need an external expert Paediatric opinion on the management of Lucy's care. Mr Fee is to test the source of such an opinion with Mr Mills.

7) Dr O'Donohoe and the staff concerned are to be encouraged to consider creating the opportunity to talk through the issues and emotions surrounding this case. Mr Fee and /or Dr Anderson could facilitate such a discussion.

8) Mr Fee and Dr Anderson gave consideration to whether or not the work arrangements require modification for any of the staff involved. In the absence of an expert opinion on the likely significance of the care given having contributed to the deterioration of Lucy's condition and the unlikely event of a reoccurrence of a similar outcome of a child presenting with this type of condition it was decided that no alteration to the work arrangements for those concerned would be appropriate at this stage.

Mr Mills advised Dr McConnell, Western Health & Social Services Board, of Lucy's condition on Friday 14 April 2000 and Mr Fee advised Dr Hamilton, Western Health & Social Services Board of her death and the Press interest on Monday 17 April 2000.

Typed on 21 April 2000

Appendix 5

Notes of a Telephone Conversation with Dr Quinn – 2 May 2000 at 2.30pm
re Lucy Crawford

Issues

1. Difficult to get a complete picture of the child
2. Type of fluids appeared appropriate. The amount given would be dependent upon the level of dehydration but would expect up to 80ml per hour.
3. When the fluids are divided over the length of stay the child received approximately 80ml per hour
4. There is no clear instruction on the volume of fluids intended nor the volume for normal saline after it was commenced
5. The volume taken over the 7 hour period appears reasonable
6. Question why was the child floppy
7. Did the child have a seizure or was it rigid, a symptom of coning?
8. 2.5mg of Valium given does not appear excessive. She could have been given up to 4.5mg of Valium.
9. Was the resuscitation adequate?
10. How much normal saline was run in?
11. If 500ml was given this may have affected the level of cerebral oedema experienced at postmortem
12. Was the child rigid at the time that the mother called the nurse or was there an event that was in advance of the mother calling the nurse?

Footnote

Nursing Staff advise that normal Saline was commenced at 3.15am and 250mls had been administered by 4.00am. The dose then was reduced to 30ml/hr for the next 2 hours.

Appendix 4

27.4.00 - Mr Tee.
Enclosed please find a factual account of the sequence of events in relation to Lucy Crawford's care, where I was involved.

nappy, then returned to the office to write out my forms.

2.55 am. The buzzer sounded in sideward 10. I went down and met Mrs Crawford in the doorway. "Nurse help Lucy help Lucy" was her words. Lucy appeared pale and rigid. I took the child and laid her in her cot, I stepped to the doorway and called loudly on SIN Mc Manus, she came immediately followed a couple of minutes later by SN T. Jones. I passed the O^2 mask to SN Mc Manus and turned on the O^2, I went out of the room and bleeped Dr Malik via switchboard, he came promptly. I went back to the room, SN Mc Manus asked me to go and get Pr diazepam, this I did. On returning to the room, I helped SIN [redacted] Jones to remove the bed from the room. I then pushed down the emergency trolley. I reassured the mother.

Then Dr O' Donoghue arrived followed approx 20 minutes later by Dr. Anderson. I was sent to the lab with blood. When I returned I was asked to go to Wd 5 for a drip.

When I returned, I stayed with the - outside on the corridor outside the roo I also stayed in close proximity to t to be able to get any further equipm required.

4.40 am. Lucy was moved to I.C.U. SN Jones & doctors accompanied her.

Teresa Mc Colgan
27/4/00.

033-102-280

LC - SLT

Dr O Donohue then ventilated a venflon into Lucy's hand and flushed it with Hepsal. I connected the i.v. line and I was instructed by Dr O Donohue to run the fluids at 100 mls p/hr until Lucy has passed urine. In the presence of Dr O Donohue Dr Malik myself Mrs Crawford and Lucy I connected the line to the drip stand and took Lucy and Mrs Crawford to cubicle 6 Medical side. Lucy vomited ++ bile colour fluid, she remained sleepy but her temp settled. Mr Crawford and Lucy's sister then came into the cubicle. This was approx 10.45 a/m and after this point I had no direct contact with Lucy.

After this time I attended to the other patients on the ward.

At approx 2.45 p/m I was attending another patient with S/N Mc Manus Sr Edmunds came into the ward and came to speak to us in the side-room. E/N Mc Caffrey came and told us Lucy had a large bowel motion S/N Mc Manus Sr Edmunds and E/N Mc Caffrey went to assist Lucy and her mother. Lucy was then moved into a side-room. Approx 2.50 p/m I was still in the side-room when E/N Mc Caffrey called for help. S/N Mc Manus, Sr James went to her assistance.

The patient I was with had settled so I came out to attend to the other patients.

I saw the emergency bell had been pushed down the ward so I followed. On I reached the door of the side-room, Mrs Crawford asked me to phone her husband which I did.

I left Mrs Crawford and her daughter with the ward Sr Edmunds also entered the ward and attended the Crawford family.

LC - SLT

Lucy Leslie phoned and told her Grandparents came to the ward.

In the meantime I continued to attend the other patients.

Lucy Leslie felt faint I took her to the day room I gave her a glass of water and sat her down by the window.

Her grandparents were in attendance

At this point I continued to attend the rest of the ward.

Appendix 10

SPERRIN LAKELAND
HEALTH AND SOCIAL CARE TRUST

ERNE HOSPITAL
ENNISKILLEN, CO. FERMANAGH. BT74 6AY. TELEPHONE [redacted] FACSIMILE [redacted]

Mr T Anderson,
Clinical Director,
Womens and Childrens Directorate,
C/O: Ob/Gyn Department,
Erne Hospital.

5/3/2000

Dear Trevor,

Attached is the report on the admission of Lucy Crawford as requested. I have tried to be as factual as possible. I have obtained a copy of the post-mortem report from her GP, copy attached.

Yours sincerely,

Dr J M O'Donohoe
Consultant Paediatrician.

LC - SLT

re. Lucy Crawford. Erne Hospital Number: 123000

I was called to see Lucy on the day of admission by the SHO on duty (Dr Malik) because he was unable to site a drip. Lucy had been admitted with a history of vomiting and drowsiness. On examination she was sleepy but rousable. Since blood had been sent for urea and electrolyte measurements I applied local anaesthetic cream to the areas where I thought I was most likely to be able to insert an IV cannula. In the meantime I gave her a bottle of fluid which she took well.

When the local anaesthetic cream had had time to take effect I inserted a cannula. While strapping the cannula in situ I saw Dr Malik writing as I was describing the fluid regime i.e. 100 mls as a bolus over the first hour and then 30 mls per hour. The 100 mls was approximately 10 ml/Kg and to cover the possibility that the cannula might not last very long and the succeeding rate was relatively slow since I had seen her taking oral fluid well and presumed the rate of fluid needed was relatively small.

I looked in to the treatment room a few minutes later and Lucy was standing on the couch in front of her mother and looking better.

I was next called at approximately 03.00 because Lucy had had what sounded like a convulsion. My initial presumption was that this was a febrile convulsion. However since she showed no signs of recovering by the time I arrived and since there was a history of profuse diarrhoea I took a specimen for repeat urea and electrolytes. This showed that the sodium had fallen to 127, a level at which hyponatraemic convulsion is rare. When I took over bagging from Dr Malik it was clear that there was no respiratory effort and her pupils were fixed and dilated. I continued bagging until Dr Auterson arrived and he intubated her and she was transferred to I.C.U.

I arranged transfer to the Paediatric Intensive Care Unit in the Royal Hospital for Sick Children, Belfast and since there was no anaesthetist available to travel with her I accompanied her. I was unable to make a diagnosis for her detioraration prior to transfer. She was hand bagged until arrival in Belfast either by myself or the accompanying nurse from ICU. The only problem in transit was a fall in her blood pressure towards the end of the journey at which point I started a dopamine infusion.

Autopsy No: A45144 PPM No: 57-00 Name: Lucy Crawford

NORTHERN IRELAND REGIONAL PERINATAL/PAEDIATRIC
PATHOLOGY SERVICE DEPARTMENT OF PATHOLOGY
ROYAL GROUP OF HOSPITALS TRUST, BELFAST

POST MORTEM REPORT

Name: Lucy Crawford
A. No: A45144
Hospital No: CH461358
PPM No: 57-00
Age: 18 months (dob: 5.11.98) Sex: F
Health Board: WHSSB
Mothers Name: May Crawford
Date of PM: 14.04.2000
Ward: PICU Hospital: RBHSC
Clinician: Dr D Hanrahan
Pathologist: Dr M D O'Hara
Total No. of Pages: 1

Provisional Anatomical Summary:

1. History of acute 24-36 hour history of vomiting/diarrhoeal illness with dehydration and drowsiness 14.4.2000.
2. History of seizure at 0300 hours 13.4.2000, pupils fixed and dilated following intubation.
3. Relatively little congestion with some distension of large and small intestine with gas and clear fluid, patchy pulmonary congestion, pulmonary oedema.
4. Swollen brain with generalised oedema, brain to be further described following fixation.
5. Heart given for valve transplantation purposes.

Signature:

Date: 17.04.2000

LC - SLT

Appendix 11

Notes of a Discussion with Sister Traynor and Nurse Swift re Lucy Crawford on 27 April 2000

Mr Fee spoke with Sister Traynor who commented that the fluid replacement volume was not unusual in a child of this age given her condition. She also stated that there did not appear to be evidence of overload of fluids. We reviewed the notes again. Sister confirmed that the rate to be administered would normally be recorded on the fluid balance chart along with the type of fluids. Mr Fee spoke to Staff Nurse Swift who confirmed that she and Dr Malik were present when the fluid regime was commenced by Dr O'Donohoe. She states they were advised to administer 100ml per hour until Lucy had produced urine. Nurse Swift was not involved in recording the 2.00am or 3.00am record of the fluid balance chart. She suggested that it was possibly Nurse Jones. Nurse Swift agreed to provide a report.

Notes of a Discussion with Staff Nurse McManus on 27 April 2000 at 10.00pm

Mr Fee spoke with Staff Nurse McManus on the telephone regarding the contents of her letter. She confirmed that she had no direct involvement in the administration or recording of fluids to Lucy Crawford

Appendix 12

Acute Services Directorate,
[redacted]

21 April 2000

Dr Quinn
Consultant Pediatrician
Altnagelvin Hospital
Londonderry

Dr Quinn

Re: Lucy Crawford

Further to my telephone conversation I am enclosing for your information a copy of the notes of the most recent admission of the late Lucy Crawford.

I would be grateful for your opinion on the range of issues discussed which would assist Dr Anderson and my initial review of events relating to Lucy's care.

These were:

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 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.

I would also welcome any other observation in relation to Lucy's condition and care which you may feel is relevant at this stage.

Can I thank you for agreeing to offer your assistance.

Yours sincerely

E Fee (Mr)
Director of Acute Hospital Services

File

Acute Hospital Services

[redacted]

EF/sb

21 April 2000

PRIVATE AND CONFIDENTIAL

Staff Nurse McNeill
HDU
Ward 5
Erne Hospital
ENNISKILLEN

Dear Nurse McNeill

Re: Lucy Crawford (deceased)

You will recall from our conversation on Tuesday, 18 April 2000, evening that I indicated it was our intention that Dr Anderson, Clinical Director, Women and Children's Directorate, and myself would carry out a review of Lucy's stay at the Erne Hospital.

The purpose of this review is to try and gain a clearer understanding of Lucy's deterioration and identify if there are any lessons to be learnt.

I would ask that you provide me with a factual account of the sequence of events, in relation to Lucy's care, where you were involved.

Lucy's case notes are available at Mrs Millar's office should you wish to to have access to them when compiling your account. Ask Mrs Millar or the Nurse in-Charge of Maternity for access to these if required.

EF/Complt

LC - SLT

I would be grateful if it would be possible for you to provide me with your report by 28 April 2000.

I am happy to discuss this request with you if you so desire.

Yours sincerely

EUGENE FEE
DIRECTOR OF ACUTE HOSPITAL SERVICES

Acute Hospital Services

[redacted]

EF/sb

21 April 2000

PRIVATE AND CONFIDENTIAL

Sister S McManus
Children's Ward
Erne Hospital
ENNISKILLEN

Dear Nurse McManus

Re: Lucy Crawford (deceased)

You will recall from our conversation on Tuesday, 18 April 2000, evening that I indicated it was our intention that Dr Anderson, Clinical Director, Women and Children's Directorate, and myself would carry out a review of Lucy's stay at the Erne Hospital.

The purpose of this review is to try and gain a clearer understanding of Lucy's deterioration and identify if there are any lessons to be learnt.

I would ask that you provide me with a factual account of the sequence of events, in relation to Lucy's care, where you were involved. I would be particularly interested in your comments on a range of issues around the prescription and administration of intravenous fluids.

These issues include:-

- What advise/recommendations do you believe Dr O'Donohoe gave in relation to the volume and type of fluids to be given?
- Over what period was it to be given?
- To whom were these instructions given?
- Are such instructions/prescriptions normally written?
- Would this volume be consistent with the volume normally given to a child of this age and weight?
- Can you clarify from the fluid balance chart for me the actual volume administered over the period 11.00pm on 12 April 2000 until 3.00am on 13 April 2000?

Lucy's case notes are available at Mrs Millar's office should you wish to to have access to them when compiling your account. Ask Mrs Millar or the Nurse in-Charge of Maternity for access to these if required.

I would be grateful if it would be possible for you to provide me with your report by 28 April 2000.

I am happy to discuss this request with you if you so desire.

Yours sincerely

EUGENE FEE
DIRECTOR OF ACUTE HOSPITAL SERVICES

Appendix 13

Notes of a telephone conversation with Ms Marion Doherty, Health Visitor, on 21 April 2000

Mr Fee spoke with Marion Doherty, Health Visitor, who has been involved with the Crawford family over a period of years.

She advised Mr Fee that she had rang the family on Friday 14 April 2000 and later called to speak with the family. The child had been seen on Tuesday 11 April 2000 by Dr Graham, GP. Mr Crawford took Wednesday 12 April 2000 off work as the child was unwell. Mother had rang Westdoc and Lucy was seen by Dr Kirby, GP. Father was stating that Erne Hospital had let them down. This statement was not supported by Mrs Crawford. It appeared to be in reference to the difficulty in establishing a drip.

Ms Doherty advised that she had attended Lucy's funeral on Sunday, had called again with the family on Wednesday 19 April 2000 and spoken to Lucy's mother who advised Ms Doherty she had the results of the postmortem.

Following discussion Ms Doherty agreed to visit the family again on 21 April 2000 and advise them that we would be happy to arrange for a discussion with them in relation to Lucy's case whenever they considered it suitable.

EF/Complaints2000

Appendix 1k

Acute Hospital Services

[redacted]

EF/sb

21 April 2000

PRIVATE AND CONFIDENTIAL

Enrolled Nurse McCaffrey
Children's Ward
Erne Hospital
ENNISKILLEN

Dear Nurse McCaffrey

Re: **Lucy Crawford (deceased)**

You will recall from our conversation on Tuesday, 18 April 2000, evening that I indicated it was our intention that Dr Anderson, Clinical Director, Women and Children's Directorate, and myself would carry out a review of Lucy's stay at the Erne Hospital.

The purpose of this review is to try and gain a clearer understanding of Lucy's deterioration and identify if there are any lessons to be learnt.

I would ask that you provide me with a factual account of the sequence of events, in relation to Lucy's care, where you were involved.

Lucy's case notes are available at Mrs Millar's office should you wish to to have access to them when compiling your account. Ask Mrs Millar or the Nurse in-Charge of Maternity for access to these if required.

EF/C

EF/Complt

033-102-302

LC - SLT

I would be grateful if it would be possible for you to provide me with your report by 28 April 2000.

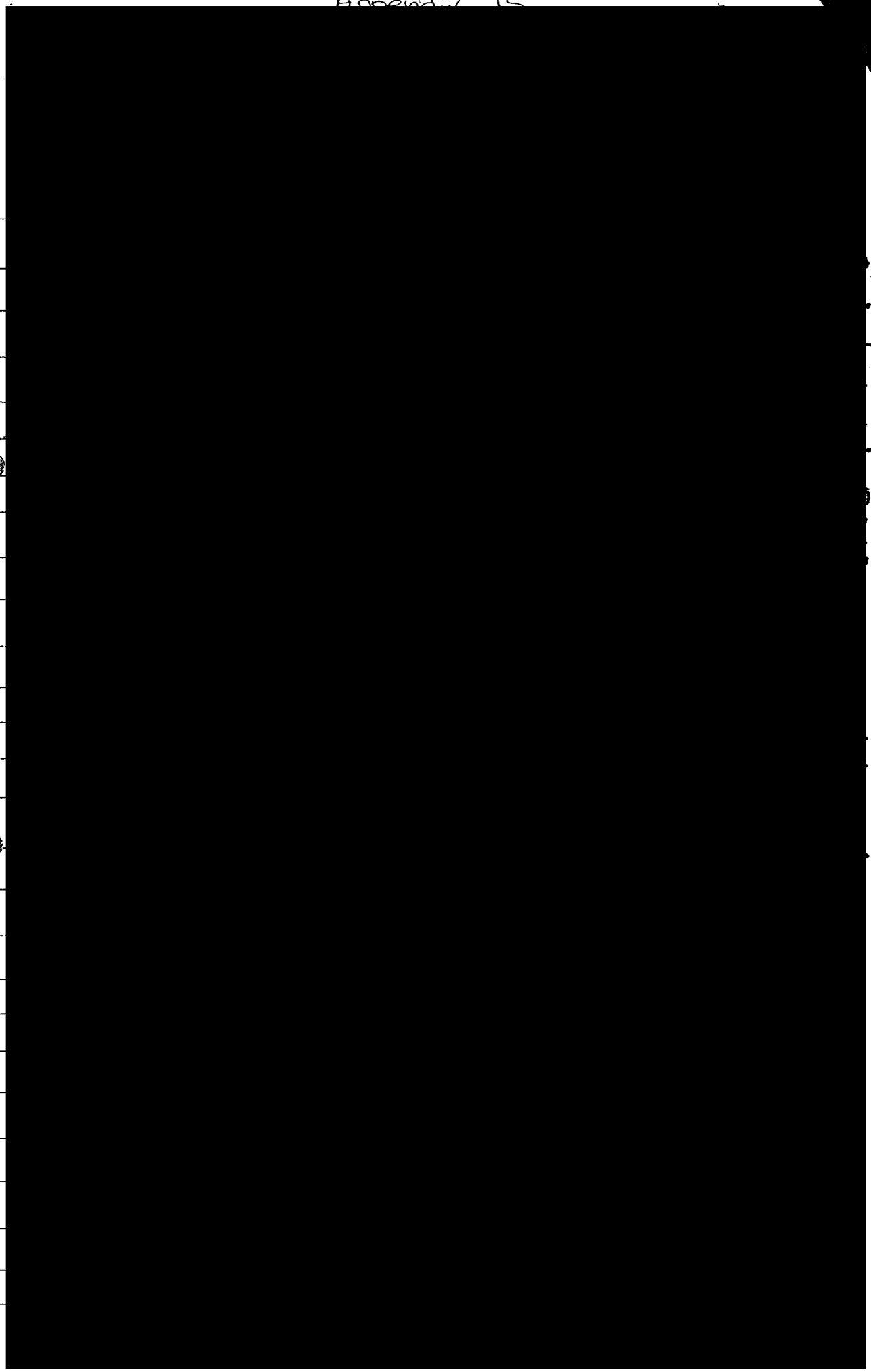
I am happy to discuss this request with you if you so desire.

Yours sincerely

EUGENE FEE
DIRECTOR OF ACUTE HOSPITAL SERVICES

EF/Complt

Appendix 15



033-102-304

[redacted]

MONTH: March 2000

WARD: Children's

033-102-305

LC - SLT

[redacted]

033-102-306

LC - SLT

Appendix 16

SPERRIN LAKELAND HEALTH AND SOCIAL CARE TRUST

TIME	ACTION	WHO	COMMENT
1930	Admitted Temp 38.6 Floppy Pulse 140 bpm Amitop Cream Resp 40	S/N McDowell	Admission time recorded 1900 on Fluid chart
1930	Examined by Dr Malik. Unable to site Cannula. Sips of oral fluid	Dr Malik	Recorded on Nursing Care Plan
2030	Dr O'Donohoe called as infant sleepy and lethargic		Recorded on Nursing Care Plan
2100	BM 3.6 Temp 38.7 Paracetamol 120mg		Recorded on Observation sheet
2100	Discussed with Dr O'Donohoe	Dr Malik	Recorded on Medical notes
2100	Urine for Testing		
2100	50 mls juice		Recorded on Fluid Chart
2100	Paracetamol 120 mg PR	S/N Swift	Recorded on Drug Administration sheet
2200	Paracetamol 120mg PR		Recorded on Care Plan
2200	100mls Dioralyte		Recorded on Fluid Balance Chart

LC - SLT

TIME	ACTION	WHO	COMMENT
2230	No 18 Soln commenced	S/N Swift Dr Malik	Time recorded on Nursing Care Plan Recorded on IV sheet Sheet not named/timed
2230	Temp 38.3		Recorded on Observation sheet
2300	IV line inserted	Dr O'Donohoe	Recorded by Dr O'Donohoe's writing in Dr Malik's medical notes
2330	Temp 37.4		Recorded on Obs.chart 'Asleep'
0000	IV Fluids listed		Recorded on Fluid chart
0015	Large vomit		Recorded on Nursing Care Plan and on Fluid char
0100	IV fluids total recorded		Recorded on Fluid chart
0200	IV fluids total recorded		Recorded on Fluid chart
0230	Diarrhoea +++ Moved to side ward		Recorded on Fluid chart and on Nursing Care Plan
0256.	Mother called Nurse with buzzer Child rigid in mothers arms.	Mother	Recorded on Nursing Care Plan.

LC - SLT

TIME	ACTION	WHO	COMMENT
0258	Dr Malik bleeped Dr Malik on Ward	E/N McCaffrey	Recorded in Recorded in Medical notes
0300	E/N McCaffrey called S/N McManus	E/N McCaffrey	
0300	Diazepam 2.5mg PR		Recorded on Nursing Care Plan
0300	Diarrhoea +++		
0315	Dr Malik called Dr O'Donohoe BM 13.6 Pulse 160 R22 Temp 36.2	Dr Malik	
0320 0320	Dr O'Donohoe on ward Decreased Respiratory effort noted	Dr Malik	Recorded by Dr Malik on Medical Notes Recorded on Nursing Care Plan
0320	Airway Inserted	Dr Malik	Recorded by Dr Malik on Medical Notes Recorded on Nursing Care Plan
0320	Intubation x2 unsuccessful – bagging continued	Dr O'Donohoe	Recorded by Dr Malik on Medical Notes Recorded on Nursing Care Plan
0445	Lucy to H.D.U.		Recorded by Dr Malik in Medical Notes

LC - SLT

UHS WHKJ

ILL PATIENTS/CONTINUATION	DAY REPORT	NIGHT REPORT
Name: [redacted] Age: [redacted] Diagnos[redacted]	[redacted]	[redacted]
Name: [redacted] Crawford Age: 1½ Diagnosis: Vomiting		Admitted with D+V. I.V fluids commenced Fitted at 02[55]. No respiratory effort. Intubated and ventilated T/F to Ward 5. then Belfast. [redacted]
Name: Age: [redacted] Diagnosis: [redacted]		
Name: Age: Diagnosis:		
Name: Age: Diagnosis:		
Name: Age: Diagn[redacted]		

LC – SLT

DATE 12/04/00

WARD Chelsea

ERNE HOSPITAL, ENNISKILLEN

NO. OF PATIENTS [redacted]

DEPENDENCY CATEGORY I = [redacted] III =

DISCHARGES/DEATHS/TRANSFERS OUT	IN-HOSPITAL TRANSFERS	DAY CASES - PROCEDURE	WARD ATTENDERS - PROCEDURE TIME
			1½ hrs

ADMISSIONS/OPERATIONS	DAY REPORT	NIGHT REPORT
Name: [redacted] D.O.B.: [redacted] Hosp. No.: [redacted] GP: Dr Singh Adm Time: [redacted] Diagnosis: [redacted]	[redacted]	[redacted]
Name: D.O.B.: 13/3/98 Hosp. No. [redacted] GP: [redacted] Adm. Time: [redacted] Diagnosis: [redacted]	[redacted]	[redacted]
Name: D.O.B.: [redacted] Hosp. No.: [redacted] GP: [redacted] Adm Time: [redacted] Diagnosis: [redacted]	[redacted]	[redacted]
Name: D.O.B.: Hosp. No.: GP: Adm Time: Diagnosis:	[redacted]	[redacted]
	Signature: [redacted]	Signature: [redacted]

LC – SLT

N/ADMIN DIARY. Appendix 17.

13 THURSDAY

8 am

9 am S/N [redacted], ccu – sick.

10 am SN [redacted] WD 4.

11 am Lucy Crawford age 17 months transferred to Belfast Sick Childrens S/N S. McNeill

12 noon T Dr ~~Donohoe~~ O'Donohoe in attendance out 8.45am Retd 10.30 am.

1 pm WD5 - S/L [redacted] Continues Sick next week

2 pm 1.30 - 5 pm. [redacted].

3 pm S/N [redacted] rang - continues sick. Hopes to resume next wk. [redacted] aware.

4 pm

5 pm

6 pm

7 pm

EVENING

MEMORANDA

2000

JAN					
M		3	10	17	24	31
T		4	11	18	25	
W		5	12	19	26	
T		6	13	20	27	
F		7	14	21	28	
S	1	8	15	22	29	
S	2	9	16	23	30	

FEB					
M		7	14	21	28
T	1	8	15	22	29
W	2	9	16	23	
T	3	10	17	24	
F	4	11	18	25	
S	5	12	19	26	
S	6	13	20	27	

MAR					
M		6	13	20	27
T		7	14	21	28
W	1	8	15	22	29
T	2	9	16	23	30
F	3	10	17	24	31
S	4	11	18	25	
S	5	12	19	26	

APR					
M		3	10	17	24
T		4	11	18	25
W		5	12	19	26
T		6	13	20	27
F		7	14	21	28
S	1	8	15	22	29
S	2	9	16	23	30

MAY					
M	1	8	15	22	29
T	2	9	16	23	30
W	3	10	17	24	31
T	4	11	18	25	
F	5	12	19	26	
S	6	13	20	27	
S	7	14	21	28	

JUNE					
M		5	12	19	26
T		6	13	20	27
W		7	14	21	28
T	1	8	15	22	29
F	2	9	16	23	30
S	3	10	17	24	
S	4	11	18	25	

(104-264) WEDNESDAY 12

8 am

WD8. E/N [redacted]

9 am

S/M [redacted] resumes—N/duty.

10 am

S/N P [redacted] ccu - sick. Contines sick tomorrow. Hopes to resume on Sat. ccu absence

11 am

SN [redacted] SW. Sick.

12 noon

SM [redacted] - Maternity - Sick.

1 pm

SN [redacted] WD9 - Sick.

2 pm

S/N [redacted] - contines sick 3/52. c.b. informed.

3 pm

~~S/M [redacted] resumes duty.~~

4 pm

S/M [redacted] Carers Leave. Child Sick.

5 pm

6 pm

EVENING

MEMORANDA

2000

JULY	AUG	SEPT	OCT	NOV	DEC
M 3 10 17 24 31	M 7 14 21 28	M 4 11 18 25	M 2 9 16 23 30	M 6 13 20 27	M 4 11 18 25
T 4 11 18 25	T 1 8 15 22 29	T 5 12 19 26	T 3 10 17 24 31	T 7 14 21 28	T 5 12 19 26
W 5 12 19 26	W 2 9 16 23 30	W 6 13 20 27	W 4 11 18 25	W 1 8 15 22 29	W 6 13 20 27
T 6 13 20 27	T 3 10 17 24 31	T 7 14 21 28	T 5 12 19 26	T 2 9 16 23 30	T 7 14 21 28
F 7 14 21 28	F 4 11 18 25	F 1 8 15 22 29	F 6 13 20 27	F 3 10 17 24	F 1 8 15 22 29
S 1 8 15 22 29	S 5 12 19 26	S 2 9 16 23 30	S 7 14 21 28	S 4 11 18 25	S 2 9 16 23 30
S 2 9 16 23 30	S 6 13 20 27	S 3 10 17 24	S 1 8 15 22 29	S 5 12 19 26	S 3 10 17 24 31

033-102-313

LC - SLT

Appendix 18 26th [illegible] 00.

Dear Mr Fee.

I am writing in response to your letter dated 21.4.00. I am unsure what format you would like this account to take. If this is just a factual account of the events for your benefit, then I am unsure of what you feel that I could add that is not already documented in the nursing kardex by myself immediately following the resuscitation.

I have appeared to have been asked for my opinions about various matters, especially in relation to the giving of I.V. fluids. I was not actually involved in the cannulation nor in the immediate administration of I.V. fluids following cannulation, so feel unable to comment on this particular aspect of the child involved's care. This is maybe something that should be discussed with those directly involved.

[redacted]

24th April 00

– am very sorry if I sound petty, but I would like to clarify in my own mind what this account will be used for, due to the overall serious nature of the matter. If this is to be a statement for official use at a later date of the events surrounding the awful and distressing events of this night, then I would like more time to be able to compose this type of document, and be able to seek some sort of outside advice to ensure that this is done correctly. If not then I feel that any information you need is accesible from my documentation in the nursing kardex as recorded at the time of the event.

Yours Sincerely

S/N S. McManus

C/o Childrens Ward.

033-102-315

Dr LUCY CRAWFORD Appendix 19. 20.4.00 (1)

I was the on-call anaesthetist on the night of Wednesday 12th April, 2000. At approx 03.40 on Thursday, 13th April, I was phoned by switchboard and told I was needed urgently in the childrens ward — no reason was given. I arrived in childrens ward shortly after 03.50, to find a child in a side ward being manually ventilated by Dr. J. O'Donohue. I was told that the child had been admitted the previous evening with vomiting, and had had some offensive diarrhoea — presumptive diagnosis being gastroenteritis. There was a cannula in the right hand or arm, and I.V. fluids were being administered. The child was pale and unresponsive. Apparently at about 03.00, the child had had some type of fit and was noted to have gone rigid. However, I was informed that at no time was the pulse absent, and cardiac arrest had not occurred. The child had had a pyrexia of 38°–39°c — ?? febrile convulsion.

I took over hand ventilation from Dr. O'Donohue and noted that the pupils were fixed and dilated and unresponsive to light. I then proceeded to intubate the child with a Portex 4.5mm uncuffed endotracheal tube, which was secured with tape, and manual ventilation resumed with 100% O_2.

033-102-316

[redacted] Child had been given rectal diazepam 2.5mg after the "fit", so I asked for 100 micrograms of flumazenil (Anexate) to be given I.V. - There was no improvement in neurological status or level of consciousness. Throughout all this, the B.P. was stable at between 80/50 and 90/60, and there was a sinus tachycardia of 130-135/min. SaO_2 was 98-100. U+E Na^+ 127, K^+ 2.5 - ? when sample taken

A portable CXR and abdominal XR revealed that I thought was a normal chest and lung fields (no signs of aspiration), but the stomach and bowel were dilated with gas. I passed a small bore oro-gastric tube to deflate the stomach (undoubtedly filled with air due to the manual ventilation earlier).

The child needed CT scan of brain and a paediatric ICU. - a bed in P.I.C.U in RBHSC was arranged. In the meantime I decided to bring Lucy to our ICU for stabilisation etc. prior to transfer.

Unfortunately, we had no paediatric ventilator available for a 17-month child who weighed approx 8 Kgs, but with some difficulty I was able to ventilate the child on a Puritan Bennett adult ventilator (V_T 200, f 20, FiO_2 1.0) despite the fact that the B.P was ~ 80/50 and

[redacted] was 80-90 (S.R.), I was unable to palpate [redacted], peripheral pulses, and was unsuccessful in cannulating either femoral artery: I did not insert a central line, due to lack of recent experience with patients of this size — however, the peripheral I.V. line was satisfactory.

At this stage I replaced the oral E.T.T. with a nasal E.T.T. of the same size, without difficulty in order to make the airway more secure during transport to RBHSC. Also, 25mls 20% Mannitol was given slowly I.V., and an I.V. antibiotic (Claforan I remember correctly) was given.

The next problem was that none of my colleagues were available to cover me in the event of my going to RBHSC with the child: Fortunately, Dr. Asghar was available to cover Dr. Donohue, who kindly agreed to go with Lucy to Belfast.

The child remained haemodynamically stable, and no pain during the above became hypoxic.

The ambulance arrived at approx. 06.10, and left the Emo with Lucy, and Dr. O'Donohue provided manual ventilation with an Ambu Bag, and an ICU nurse, at approx. 06.30.

At approx 08.30, I rang RBHSC P.I.C.U.

[redacted] was informed that Lucy had arrived safely and was being stabilised on a ventilator. Sadly there had been no improvement in neurological status, and this persisted until approx 12.00 the next day (Friday 14th April) when brain stem death was confirmed, and ventilation was discontinued.

This is as accurate a description of events that I can remember.

I.N. Anderson,

DR. I.N. ANDERSON F.F.A.R.C.S.

P.S. I anaesthetised Mrs. May Crawford for the LUSCS to deliver Lucy, approx 17 months ago. Also my wife [redacted] is the family's G.P.

Copy to Dr Andrews for inclusion with reports ✓ 25/5/00

Appendix 20

[redacted]

18th May 2000

Mr Eugene Fee
Erne Hospital
ENNISKILLEN

Dear Mr Fee

RE: Lucy Crawford – Daily Fluid Balance Chart – Dated 12/4/00

I refer to the above document and confirm that the entries made for 1.00a.m; 2.00a.m and 3.00a.m were completed by myself.

The amounts of fluid as noted to the left of each box give a complete and accurate record of all intravenous fluid dispensed during that period. However I do note that the running total as indicated to the right of each box has not been tallied correctly.

If I can be of further assistance please feel free to contact me

Yours Sincerely

DHS OFFICE TCM 23 MAY 2000 RECEIVED

Thecla Jones.

Thecla Jones

033-102-320

LC – SLT

Appendix 22

CHILDREN'S WARD **ERNE HOSPITAL**

EMERGENCY ADMISSION POLICY

1. Show patient to prepared bed.

2. Record baseline observations i.e. Temperature, pulse, Blood pressure, respiration's (C.N.S. observations if required) and also patients condition. Continue to record observations - quarter hourly - half hourly, reducing as condition permits - for a minimum of 24 hours. Report any significant change. Record weight and height (Head circumference recorded on children under one year by medical staff).

3. Inform Doctor of admission and record time informed.

4. Carry out necessary documentation i.e. past history, present history, social history and make an assessment of the activities of daily living.

5. Provide parents with ward information leaflet.

6. Record time that Doctor arrives to see patient. Assist Doctor with examination and any procedures he may carry out, giving full explanation of same to patient and parent.

7. Carry out routine investigations of skin swabs, umbilical swabs etc. on babies under half year, M.S.U. x 1 if toilet trained.

   Uribag specimens x 3 if wearing nappies. Any other as indicated by Medical Staff

033-102-321

[redacted]

Appeal
15.

WARD: [redacted]

033-102-322

LC – SLT

[redacted]

MONTH: March - April 2000

033-102-323

LC – SLT

MONTH : March / April 2000

[redacted]

033-102-324

LC – SLT