

**NAME OF CHILD: Raychel Ferguson**

**Name:** Brain McCord

**Title:** Consultant Paediatrician

**Present position and institution:** Consultant Paediatrician, Altnagelvin Hospitals H&SS Trust, Glenshane Road, Londonderry, BT47 6SB

**Previous position and institution:** As Above  
*[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 1995-December 2004]*

MB Bch BAO QUB, Belfast, 1979  
 DCH College of Surgeons, Dublin, 1982  
 MRCP (UK) Edinburgh, 1983  
 Appointed Consultant Paediatrician Altnagelvin Area Hospital, 1989

Drug & Therapeutics Committee, Altnagelvin Hospital  
 Foyle Paediatric Asthma Group – Altnagelvin Hospital / Community  
 Radiation Protection Committee – Altnagelvin Hospital

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

12/06/01 Statement 012-009-105,106 Statement made without access to hospital casenotes hence mis-spelt first name (Rachael) / time error (03.45 recall – later revised on Deposition)  
 06/02/03 Inquest deposition 012-36-170, 171, 172, 172a

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

Ref:	Date:	
012-009-105-106	12.06.01	Statement
012-036-170-172a	06.02.03	Deposition at Inquest into the death of Raychel Ferguson

**Particular areas of interest**

*[Please attach additional sheets if more space is required]*

1. Describe in detail your role in the treatment and care of Raychel Ferguson during the early hours of 9<sup>th</sup> June 2001, to include:
  - (i) the advice you gave Dr Trainor when she contacted you at approx 4.35 am; and
  - (ii) your observations and concerns in respect of Raychel when you arrived in ward 6 and the steps you took as a result .

As Consultant Paediatrician at Altnagelvin Hospital I was on call from 0900 hours (08/06/01) to 0900 hours (11/06/01).

My primary responsibility would be to care for all paediatric medical and neonatal intensive care unit admissions during this time period. I would be assisted by 2 tiers of resident junior doctors: (a) a Senior House Officer (SHO) first term, and (b) a more experienced middle grade SHO second term or Registrar, with previous paediatric experience. I provide on call cover from home and provide support, advice and additional physical assistance as or when required.

Typical on call weekend working also involves a full paediatric medical inpatient ward round on Saturday and Sunday mornings.

The primary aim of admission to a paediatric ward is to treat in a child-friendly controlled environment and have ready access to paediatric nursing staff. Consequently a number of other children are admitted to paediatric wards who do not require paediatric medical expertise, being admitted and treated by other specialty teams e.g. general surgery and surgical sub-specialties such as ENT etc.

Whilst inpatients, these children remain the responsibility of their named Consultant but paediatric medical advice or assistance is readily available at both senior and junior level, upon request.

In the early hours of 09/06/01 I received a call from Dr Trainor regarding a nine year old girl, previously unknown to either of us, being under the care of surgical colleagues, who had had an epileptiform episode (ref 020-007-013) requiring rectal and intravenous Diazepam (ref 020-017-034) but who remained inexplicably unwell and had petechiae (ref 020-015-023).

(i)

My immediate advice was to commence high dose intravenous antibiotics i.e. meningitis treatment dose (ref 020-017-034), to seek Anaesthetic assistance if further deterioration (ref 020-015-024) and that I was returning to Hospital to assist (ref 020-015-024).

(ii)

Upon my arrival in Ward 6, I discovered that the patient was Raychel Ferguson aged nine. In the interim she had deteriorated and had been intubated and manually ventilated in Ward 6 (ref 020-015-024), (ref 020-024-048). Raychel's medical history was quickly reviewed and brief neurological/ ophthalmological examination undertaken (ref 020-015-025) which revealed fixed dilated pupils and sharp well defined optic discs. By this time, biochemical analysis of blood had become available, indicating a profoundly low serum sodium (ref 020-015-024) (ref 020-015-025) (ref 020-022-044) and low serum magnesium (ref 020-022-044).

Given the biochemical abnormality noted further changes were made to Raychel's treatment regime in addition to that suggested earlier by telephone, namely to switch her maintenance intravenous fluid from 0.18% sodium chloride / 4% dextrose (number 18 solution or Solution 18) to normal saline (0.9% sodium chloride) and reduce fluid administration rate to 40mls per hour (ref 020-019-038). Intramuscular magnesium sulphate was also administered (ref 020-017-034).

Appropriately electrolyte profile was re-checked but simply confirmed earlier abnormality (ref 020-022-043).

Prompt CT Scan was organised.

- 2. Explain your further role if any in the treatment of Raychel when she was moved from ward 6 at 5.30am on 9<sup>th</sup> June 2001, to include:**
- (i) your diagnosis at the time of the possible cause of Raychel's condition in light of any test results then known and scans taken; and**
  - (ii) your understanding of Raychel's condition when she left Altnagelvin Hospital for RBHSC at 11.10am.**

Although Raychel was accompanied to the Radiology Department by myself and members of the Paediatric team because of her intubation and ongoing ventilation she became the primary responsibility of Anaesthetic colleagues who would liaise with the appropriate surgical specialties and/or paediatric ICU, the paediatric team would continue to offer advice or support as requested.

(i)

Summarisation of Raychel's case history would indicate a previously healthy nine year old girl who had an uneventful appendicectomy with reported post operative vomiting who had subsequently had an epileptiform episode approximately 24 hours post op. She appeared unwell and had petechiae. Deterioration occurred with respiratory arrest requiring intubation and ventilation. Fixed dilated pupils were noted. Concurrent electrolyte abnormality indicating profound Hyponatraemia was also noted.

Such history would raise suspicion of septicaemia/meningitis or intracerebral haemorrhage. Planned CT brain scan would hopefully clarify the diagnosis.

It was unknown whether the marked electrolyte disturbance was a primary or secondary phenomenon.

(ii)

As my direct contact with Raychel ended I made a retrospective note in the clinical casenotes at 0615 hours 09/06/01 (ref 020-015-025). On review I note that I have commented on the CT film being verbally normal.

I cannot fully explain this other than to cite possible sleep deprivation, a desire to return to normal duties, and perhaps radiographers comments prior to formal assessment by Consultant Radiologist (ref 020-015-026): noting that the initial report is untimed. Certainly I was unaware that a second CT brain had been requested and performed and only learned of this some time later.

I had no further direct contact with Raychel as intended placement after CT scan was ICU for further stabilisation / treatment and likely onward transfer to Belfast.

At the time of Raychel's departure from Altnagelvin (11:10 hours) I would have been on routine ward round duties on Ward 6.

**3. Describe the steps you took to communicate with the family of Raychel Ferguson from your arrival in ward 6 that morning until she was transferred to the RBHSC together with details of the information you gave them. Give details of any further communications, if any, that you had with Raychel's family thereafter.**

I have made no formal note in the casenotes regarding information disclosed or conversations with the family, this I regret.

However, I have faint recollection of speaking to two female relatives in the corridor of Ward 6 after my arrival in Ward 6 pending Raychel's transfer downstairs to CT suite. If memory serves me correctly I think I outlined what had happened to Raychel so far and outlined our plan for urgent CT, I think I also mentioned the low serum sodium as being possibly linked.

I have no recollection of speaking to family in the CT suite but it is possible that I may have done.

I formally met again with family on 3<sup>rd</sup> September 2001 at a planned meeting between the family and hospital staff arranged by Mrs Stella Burnside, Chief Executive, Altnagelvin Hospitals H&SS Trust (ref 022-084-215-224). Information provided to the family at that meeting are minuted and are a combination of fact, comment and opinion.

I had further contact of a brief social nature with family members at subsequent attendance at the Coroner's Court on 6<sup>th</sup> February 2003.

**4. Explain your understanding of the responsibility for the prescribing of post operative fluids for paediatric patients at Altnagelvin hospital in June 2001 to include your role, if any, in the formulation of paediatric ward protocol in respect of the fluid management of paediatric patients at Altnagelvin at that time.**

My understanding of the prescription of intravenous fluids post operatively in children's ward was that this was the responsibility of the named Surgical Clinician. The responsibility sometimes being shared in the short-term i.e. immediate post operative period between Anaesthetic and Surgical staff. Paediatric medical involvement was ad hoc and advisory.

At the time of Raychel's death in June 2001 no formal protocol existed for intravenous fluid administration in children's ward other than what was custom in practice over the preceding years, this was irrespective of whether the children were under surgical or paediatric medical care. The only area where clear guidelines on intravenous fluid administration existed was in neo-natal intensive care.

- 5. Explain your role in the investigation into the circumstances of the death of Raychel Ferguson carried out at Altnagelvin hospital, to include:**
- (i) details of your input into the action plan formulated on 13.06.01;**
  - (ii) your further involvement ,if any, in steps taken by Altnagelvin hospital as a result of Raychel's death; and**
  - (iii) any steps taken by you to alert colleagues at other hospitals in Northern Ireland to the death of Raychel.**

With only fleeting clinical contact and brief clinical responsibility for Raychel during her illness and untimely death I have limited offerings into the investigations of her death, however, by way of assistance I attended a series of meetings offering a paediatric viewpoint and support to ward paediatric nursing staff.

(i)

An initial critical incident review meeting took place on 12<sup>th</sup> June 2001 (ref 026-011-012) (ref 022-108-334) (ref 022-108-335) (ref 022-108-336) (ref 022-108-337) (ref 026-004-005) (ref 026-011-014). As a consequence I agreed to draft a maintenance fluid infusion rate chart for paediatric patients based on weight and display graphically - this was aimed primarily in assisting junior surgical doctors (ref 026-009-010). The chart was made available and displayed on Ward 6 somewhere between July (ref 022-097-307) and September 2001 (ref 022-096-306).

An additional contribution to that meeting was to suggest monitoring of capillary blood glucose in children being treated for extended periods with Hartman's solution (compound sodium lactate) if being used in preference to glucose containing solutions (ref 022-108-337).

There followed an almost immediate reaction to the events of 09/06/01 to transfer responsibility for all intravenous fluid management to paediatric medical staff (ref 026-005-006). However, this was not at all feasible or practical nor necessarily desirable. As before paediatric medical input into intravenous fluid management in surgical patients remained advisory not supervisory.

For a time there was a distinct divergence between IV fluid management between post operative surgical children and paediatric medical inpatients (ref 026-010-011) with blanket use of Hartman's solution for the former and continued use of Solution 18 for the latter unless indicated otherwise by clinical condition.

In parallel, systems for monitoring of fluids and electrolytes were enacted – between nursing and surgical staff (ref 022-092-299).

In early April 2002 a review meeting charted progress (ref 022-092-299).

Around this time Department of Health guidance was issued setting out standards for IV fluid management in children aimed at reducing the risk of hyponatraemia. This advice took the form of A3 posters (widely and prominently displayed on Ward 6) and written advice to Consultants (ref 026-019-046). This document although quite general in nature suggested the development of further local guidance on fluid management. Contemporaneously an alternative to Solution 18 was being increasingly used and more widely available namely 0.4% sodium chloride and 2.5% dextrose therefore this seemed an opportune time to switch from Hartman's solution post operatively in surgical patients and switch from Solution 18 as maintenance fluids in paediatric medical patients and ultimately reducing the previous disparity between the two groups.

(ii)

This led to me producing a consensus statement of IV fluid management in Ward 6. This was produced in draft form (ref 021-051-109-110) (ref 021-051-111-112) (ref 021-052-113-114). Subsequently a statement was forwarded to Risk Management and Pharmacy for comment (ref 021-046-101) (ref 021-050-108) before the final document was signed by Clinicians and accepted generally (see enclosed, no prior reference).

(iii)

Other than within our own paediatric department I had no personal contact with colleagues in other hospitals, however, a clear lead was given by our Anaesthetic colleagues in a widespread discussion of this topic both between disciplines i.e. Anaesthetics/Surgery and between other hospitals in Northern Ireland.

**Other points you wish to make including additions to any previous Statements, Depositions and or Reports**

*[Please attach additional sheets if more space is required]*

Signed: 

Dated: 20/06/05



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Women and Childrens Directorate

## **Intravenous Fluid Therapy for Paediatric Patients (Consensus Statement)**

**Effective date:** May 2002

**Review date:** May 2003

The principal routine I.V. fluid solution for use in paediatric patients is Sodium Chloride 0.45% / Glucose 2.5%. Table 1 indicates the solutions held in Altnagelvin Hospital.

Table 1: Sodium Chloride 0.45% and Glucose 2.5% held in Altnagelvin Hospital

<b>Volume</b>	<b>Fluid</b>
<b>500ml</b>	<b>Sodium Chloride 0.45% and Glucose 2.5%</b>
<b>1000ml</b>	<b>Sodium Chloride 0.45% and Dextrose 2.5%</b> <b>containing potassium 20mmol / Litre</b> <b>Refer to Potassium Policy</b> <b>(Unlicensed)</b>

**NOTE:** Other I.V. fluid solutions may be appropriate in children, infants and neonates at the discretion of responsible Consultant / Ward Protocol or dependent on underlying clinical condition.

I.V. fluid therapy should not be routine but based on clear justifiable indications.

Examples include:

- State of hydration
- Vomiting
- Excess fluid loss
- Prolonged fasting
- Inability to use oral / enteral route

Initial prescription of I.V. fluids should be based on a clinical assessment of state of dehydration, biochemistry and body weight (actual weight preferred but estimate if no recent weight recorded).

Reference charts showing weight-based maintenance I.V. fluid rates are readily available on Ward 6.

I.V. fluid solutions and rates of administration are the responsibility of the relevant Paediatric Medical or Surgical staff. In surgical patients, Anaesthetic staff may prescribe fluids for the first 12 hours postoperatively.

Continued use of I.V. fluids beyond 12 hours requires reassessment by a senior doctor. The decision to continue I.V. fluids should be individualised but factors worthy of consideration include oral intake, continued fluid losses, urine production and nursing/medical assessment of general conditions. Where the 12-hour period ends after midnight, an evening assessment of likely I.V. fluid requirement is appropriate.



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**CURRICULUM VITAE**

**OF**

**DR FRANCIS BRIAN McCORD**

**CURRICULUM VITAE**

NAME: Dr Francis Brian McCord

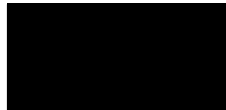
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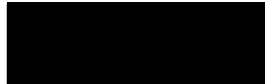
CURRENT POSITION:

Consultant Paediatrician  
Altnagelvin Area Hospital  
Londonderry  
BT47 6SB  
(Appointed 1.8.89)

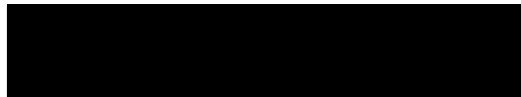
MARITAL STATUS:



DATE OF BIRTH:

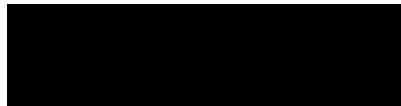


PLACE OF BIRTH:



EDUCATION:

Primary:



Secondary:



MEDICAL SCHOOL:

Queen's University of Belfast  
1973 - 1979

QUALIFICATIONS:

MB, BCh, BAO	Jul 1979
DCH	Apr 1982
MRCP (UK)	Nov 1983
FRCP (London)	Jul 1996

## PREVIOUS APPOINTMENTS:

**JHO**                      **Belfast City Hospital**                      **Aug 1979 - Jul 1980**

3 months    general paediatrics  
3 months    geriatrics  
3 months    general surgery  
3 months    fracture surgery

**SHO**                      **Belfast City Hospital**                      **Aug 1980 - Jul 1981**

6 months    general paediatrics  
6 months    neonatal intensive care

**SHO**                      **Musgrave Park Hospital**                      **Aug 1981 - Jan 1982**

6 months    general medicine

**SHO**                      **Belfast City Hospital**                      **Feb 1982 - Jul 1982**

6 months    neonatal intensive care  
( 1:1 rota)

**Registrar**                      **Royal Belfast Hosp for Sick Children**                      **Aug 1982 - Jan 1983**

6 months    professorial ward - regional gastroenterology/  
renal/endocrine referrals

**Registrar**                      **Belfast City Hospital**                      **Feb 1981 - Jul 1983**

6 months    general paediatrics/neonatal intensive care

**Registrar**                      **Waveney Hospital, Ballymena**                      **Aug 1983 - Jul 1984**

12 months    general paediatrics/neonatal intensive care

- Registrar**      **Ulster Hospital, Dundonald**      **Aug 1984 - Jul 1985**  
12 months    general paediatrics/neonatal intensive care
- Research Fellow**      **Royal Maternity Hospital, Belfast**      **Aug 1985 - Jul 1986**  
12 months    Surfactant replacement in severe RDS  
Doppler ultrasound studies on cerebral/  
cardiac haemodynamics  
  
(See list of publications and presentations)
- Registrar**      **Royal Maternity Hospital, Belfast**      **Aug 1986 - Jul 1987**  
12 months    regional neonatal intensive care (1:3 rota)
- Senior Reg**      **Royal Belfast Hosp for Sick Children**      **Aug 1987 - Jan 1988**  
6 months    professorial ward - regional gastroenterology/  
renal/endocrine referrals
- Senior Reg**      **Ulster Hospital, Dundonald**      **Feb 1988 - Jul 1988**  
6 months    general paediatrics/neonatal intensive care
- Senior Reg**      **Altnigelvin Area Hospital**      **Aug 1988 - Jul 1989**  
12 months    general paediatrics/neonatal intensive care

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**CURRENT APPOINTMENT:**

Consultant Paediatrician, Altnagelvin Area Hospital

**COMMITTEE MEMBERSHIP:**

Drugs & Therapeutics Committee, Altnagelvin Area Hospital

Foyle Paediatric Asthma Group (Hospital/primary care paediatric asthma)

Care of Next Infant (CONI) Group (Hospital/primary care management of subsequent sibs to SIDS families)

5

**PUBLICATIONS:**

1. *McCord F B; Jenkins J G; Lim J H K*

C-reactive protein concentration as screening test for bacterial infection in febrile children  
BMJ 1985; 291 : 1685 - 6

2. *McCord F B; McNeill A; Shields MD; McClure B G; Halliday H L; Reid M McC*

Pulsed doppler ultrasound in cerebral arteriovenous malformation.  
Obstetrics and neonatal blood flow  
Conference Proceedings Vol 2, Biological Engineering Society, 1987

3. *McCord F B; McNeill A; Shields M D, McClure B G; Halliday H L; Reid M McC*

Cerebral arteriovenous malformation in a neonate: assessment by doppler ultrasound and successful treatment by embolisation  
Arch Dis Child 1987; 62 : 1273 - 5

4. *McCord F B; Curstedt T; Halliday H L; McClure B G; Reid M McC; Robertson B*

Surfactant treatment and incidence of intraventricular haemorrhage in severe respiratory distress syndrome  
Arch Dis Child 1988; 63 : 10 - 6

5. *Stewart M; Savage J M; Bell B; McCord B*

Longterm renal prognosis of Henoch-Schonlein Purpura in an unselected childhood population  
Eur J Pediatr. 147 : 113 - 5

6. *Shields M D; Wales I; McCord B; Halliday H L; McClure G*

Rapid assessment of pulmonary maturity by drop volume method  
J Obst Gynaecol 1988; 8 : 319 - 321

7. *Collaborative European Multicentre Study Group - Contributor*  
Surfactant replacement therapy for severe neonatal respiratory distress syndrome: an international randomised clinical trial
  
8. *McCord F B; Halliday H L; McClure B G; Reid M M C C*  
Changes in pulmonary and cerebral blood flow after Surfactant treatment for severe RDS  
Conference proceedings XI European Perinatal Congress Harwood Academic Publishers
  
9. *Halliday H L; McCord F B; McClure B G; Reid M M C C*  
Acute effects of instillation of Surfactant in severe respiratory distress Syndrome  
Arch Dis Child 1989; 64 : 13 – 16
  
10. *Collaborative European Multicentre Study Group - Contributor*  
Factors influencing the clinical response of Surfactant replacement therapy in babies with severe respiratory distress syndrome  
Eur J Paed 1991; 150 : 433 – 39
  
11. *Han K T; Wilson D C; McCord F B; Halliday H L; McClure B G; Reid M M C C*  
Serum C-reactive protein is a useful marker for congenital infection  
Pediatr Allerg Immunol 1990; 1 : 64 – 7
  
12. *Ruane B J; McCord F B*  
Factor X deficiency - a rare cause of scrotal haemorrhage  
Ir Med J 1990 Dec; 83 (4) : 163
  
13. *Casey, F; Brown D; Corrigan N; Craig B G; Quinn M; McCord B; Rogers J; Mulholland H C*  
Value of a low-cost telemedicine link in the remote echocardiographic diagnosis of congenital heart defects.  
J Telemed Telecare 1998; 4 Suppl 1 : 46 – 8

14. *Mulholland H C; Casey F; Brown D; Corrigan N; Quinn M; McCord B; Rogers J; Craig B G*

Application of a low cost telemedicine link to the diagnosis of neonatal  
Congenital heart defects by remote consultation  
Heart. 1999 Aug; 82 (2) : 217 - 21



## PAPERS PRESENTED:

*Ulster Paediatric Society Junior Member Forum.*

December 1983 - CRP - A helpful test?

December 1984 - C-reactive protein concentration as a screening test for bacterial infection in febrile children  
(Awarded 1<sup>st</sup> prize)

December 1985 - Indomethacin alters cerebral blood flow

December 1986 - Natural Surfactant therapy for severe IRDS reduces the incidence of intraventricular haemorrhage  
(Awarded 1<sup>st</sup> prize)

*Irish Perinatal Society.*

May 1986 - Cerebral blood flow velocities in patent ductus arteriosus

September 1986 - Preliminary results with porcine surfactant treatment of severe hyaline membrane disease in premature infants

September 1987 - Changes in cardiac and cerebral blood flow after partial plasma exchange for polycythaemia

*Irish Paediatric Society.*

November 1986 - Intravenous Indomethacin reduces cerebral blood flow

*Biological Engineering Society.*

April 1986 - Pulsed doppler ultrasound in cerebral arteriovenous  
London malformation

*International Symposia on Surfactant Replacement Therapy.*

- May 1986 - Amsterdam, Holland  
Comparison cardiac/cerebral blood flow between treated and control babies
- May 1987 - Mantova, Italy  
The Belfast Experience of Surfactant Replacement Therapy
- Nov 1987 - Rotterdam, Holland  
Changes in cerebral and pulmonary blood flow after Surfactant replacement
- May 1988 - Belfast, N Ireland  
Changes in pulmonary and cerebral blood flow after Surfactant treatment for severe RDS

*British Paediatric Association.*

- Apr 1987 - York, England  
Natural porcine Surfactant replacement therapy for severe RDS reduces the incidence of pneumothorax and intraventricular haemorrhage

*Summer School for Paediatric Research.*

- May 1987 - University of Newcastle-upon-Tyne, England  
Changes in cerebral blood flow after i.v. Indomethacin for symptomatic PDA

*International Meeting on Cerebral Doppler.*

- July 1987 - Leicester, England  
Alterations in cerebral blood flow velocities and cardiac output following i.v. indomethacin in infants with large patent ductus arteriosus

*Ulster Obstetrical & Gynaecological Society.*

- Feb 1987 - The Belfast Experience with Surfactant replacement therapy for severe respiratory distress syndrome. (Awarded Syntex Lecture)

*Royal Victoria Hospital.*

Oct 1987 - Surfactant replacement therapy in Belfast  
(Awarded Calvert Lecture)

**Miscellaneous:***European Perinatal Congress.*

April 1988 - Rome, Italy  
Changes in pulmonary and cerebral blood flow after Surfactant replacement therapy  
(Awarded 3<sup>rd</sup> prize)

*Medical Ultrasound Course.*

December 1988 - School of Radiography, Royal Maternity Hospital  
Uses of pulsed doppler ultrasound in the newborn period

**LEARNED SOCIETIES**

Collegiate Member, Royal College of Physicians of Edinburgh

Ulster Paediatric Society

Irish Perinatal Society

Fellow Royal College of Physicians of London

Fellow Royal College of Paediatrics & Child Health

**OTHER INTERESTS**

Good food

Music

Computers

## CME Activity 2001

- Expert Opinions on the Challenge of RSV  
Jan 2001; Royal College of Physicians, London.
- Care of Hospitalised Children in Developed and Developing Countries  
Jun 2001; MDEC, Altnagelvin.
- Paediatric Advanced Life Support Course  
Aug 2001; Tyrone County Hospital.
- The Future of Paediatrics – Issues for Trainees, Issues for Consultants  
Oct 2001; Antrim Area Hospital.
- Professional Training Course – nasal CPAP  
Nov 2001; Heriot Watt University.
- Hot Topics in Neonatology  
Dec 2001; Washington DC.
- Synagis: The European Experience  
Dec 2001; Washington DC.
- Responding when a baby dies suddenly and unexpectedly  
Dec 2001; Royal College of Physicians, London.