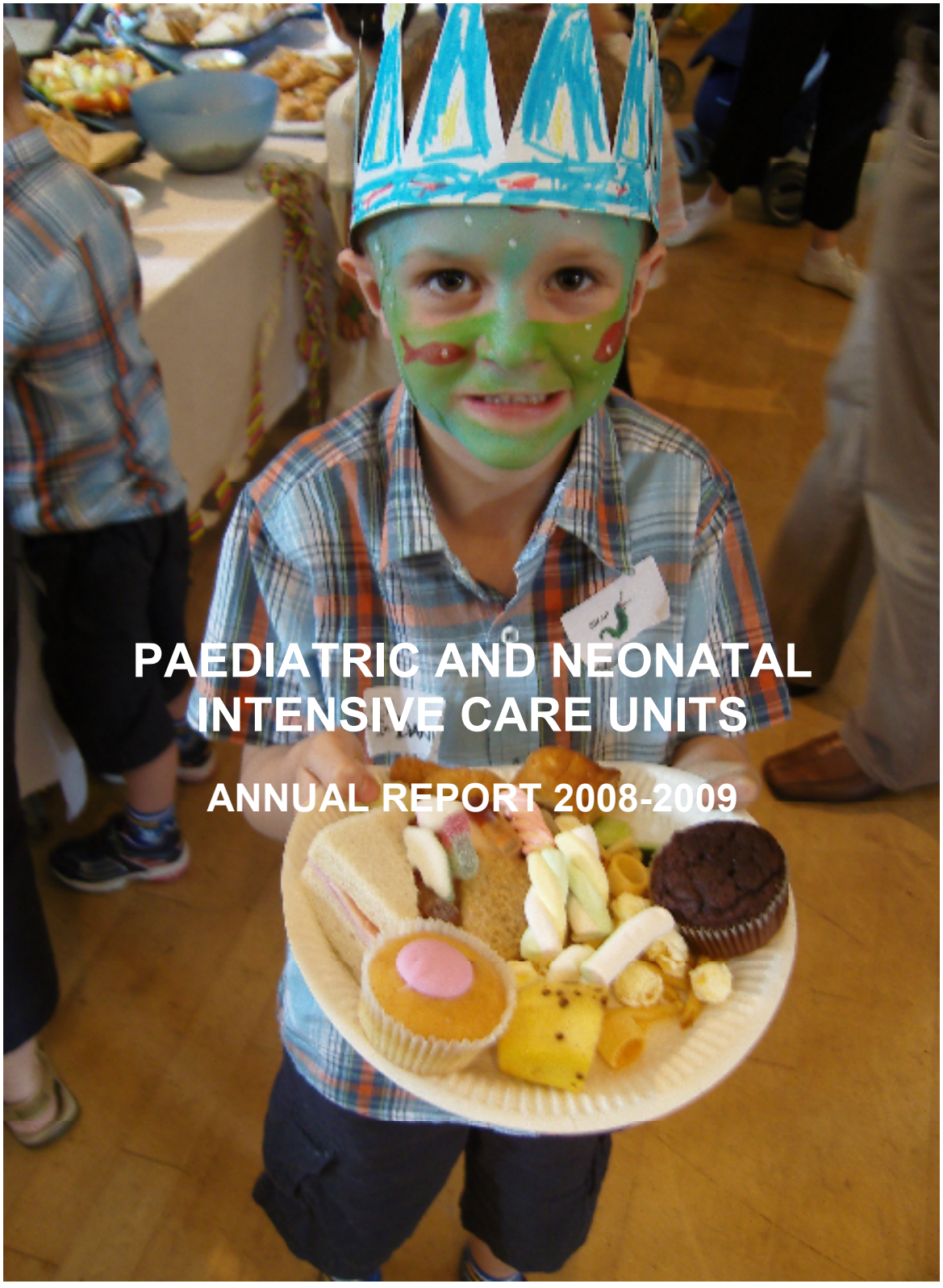
Great Ormond Street Hospital for Children NHS Trust



PAEDIATRIC AND NEONATAL INTENSIVE CARE UNITS

ANNUAL REPORT 2008-2009

Contents

Introduction

We are proud to present our first annual report. Something we should have done years ago! The purpose of the report is to describe our activity over the last year. We hope the information in the report will demonstrate how the team has worked to facilitate activity for all our colleagues within the Trust and also to the wider community of North Thames and further afield. We wanted to give our users a detailed breakdown of how their patients have been managed over the year. The report also gives us the opportunity to demonstrate how we have cared for our patients and, almost as importantly, the parents of our children. Our aim is to provide excellent care to critically ill children in an environment that is sensitive to the needs of the child and the family.

As you probably know we are the nominated lead centre for provision of Paediatric Intensive Care in North Thames and a recognised centre for training in Paediatric Intensive Care medicine. Our Intensive Care is one of the largest for children in the UK and Europe.

There are two distinct units – the Neonatal Intensive Care Unit (NICU) and the Paediatric Intensive Care Unit (PICU), however, they work closely together. NICU is funded for 10 cots and PICU is funded for 11 beds by the PIC consortium. The nursing and medical teams led by a team of eight consultants, work closely together allowing greater flexibility. Information and statistics contained in this report refer to the unit as a whole, unless specifically stated otherwise.

Neonatal Intensive Care

The NICU is part of the North Thames Central Neonatal Network. In this collaboration we aim to provide the best service possible for neonates by sharing best practice and service opportunities with our colleagues in UCLH, the Whittington, Royal Free, Chase Farm and Barnet. We have regular meetings with colleagues from UCH neonatal unit to discuss

The NICU treats approximately 400 patients per year. There is no obstetric facility within Great Ormond Street Hospital so this is not a traditional NICU. The NICU primarily admits general surgical neonates referred from other hospitals; they are often preterm but not necessarily so. Neonates with necrotising enterocolitis, tracheoesophageal fistulae, bowel obstruction, oesophageal atresia, and other congenital anomalies are treated on NICU. Neonates with complex medical and surgical problems for other specialities such as laryngeal clefts, sacrococcygeal teratomas, are also admitted. There is ongoing extensive research by both surgical and medical teams into causes and treatments for necrotising enterocolitis in neonates.

We also admit neonates brought to Great Ormond Street Hospital who may need extracorporeal life support (ECLS, also known as ECMO) and employ maximal medical management. This includes nitric oxide and high frequency oscillation to try to avoid the use of ECLS if possible. Two of the consultants have a specialist research interest in persistent pulmonary hypertension of the newborn.

Staff on NICU offers a strong support network for families and there are regular midwife clinics, family liaison nurses, psychological support and breastfeeding specialists available. The excellent feedback we have received from families in the recent North Thames Central Neonatal

Network Survey demonstrates the success of these efforts.

Paediatric Intensive Care

Approximately 1,000 patients per year are admitted to PICU. The majority of our patients come from North Thames but we also admit patients from all over the UK and abroad. This reflects the wide range of specialist services provided by us for critically ill children in our unit.

We admit children post operatively who have had specialised surgery at Great Ormond Street Hospital. We offer support and services for our colleagues in other specialities such as general surgery, oncology, neurology, metabolic medicine, renal medicine, spinal surgery, ENT, respiratory and endocrinology. Great Ormond Street Hospital is the only UK centre for the treatment of infants with Vein of Galen who often require intensive care services.

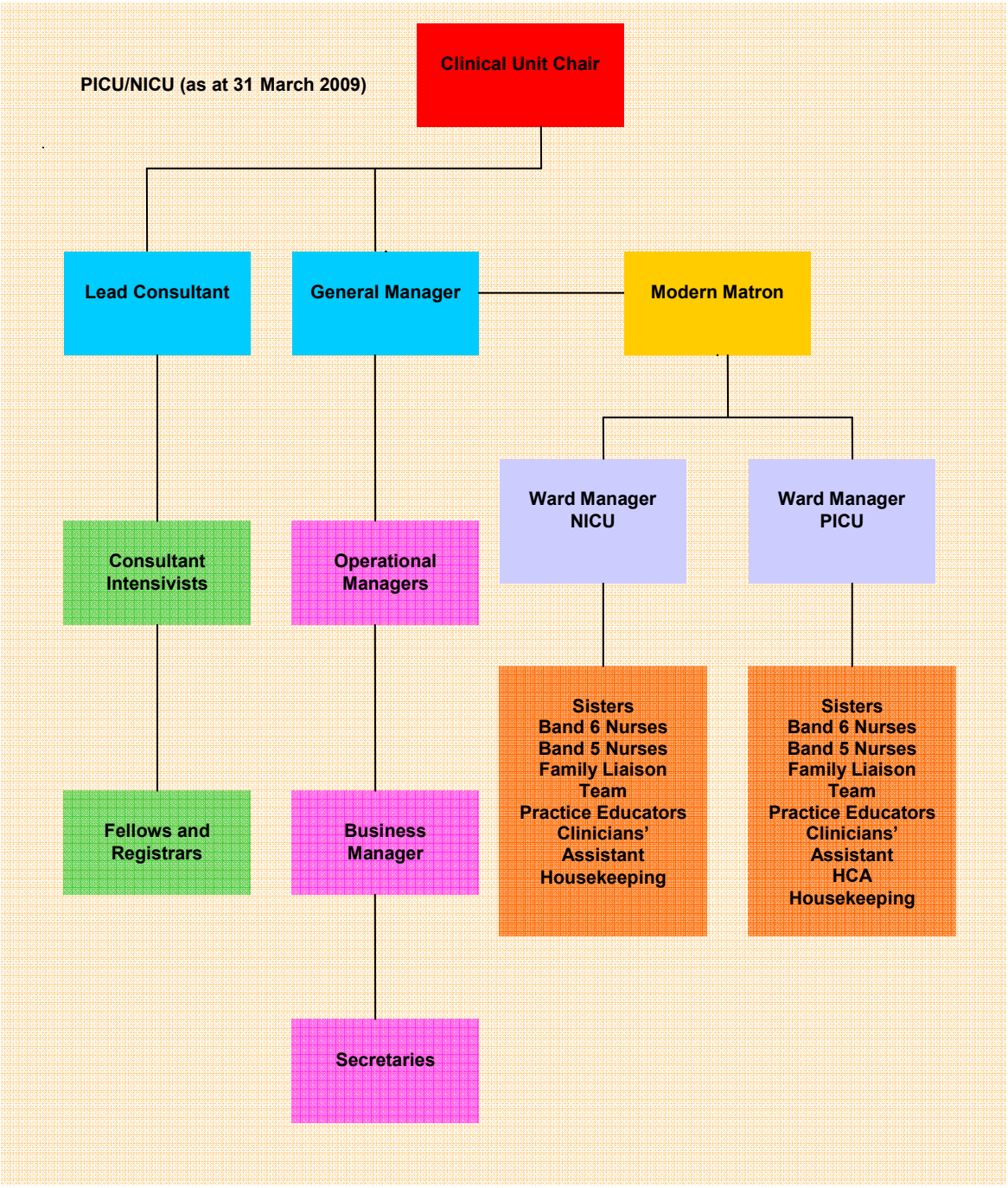
We are one of two London centres for children requiring neurosurgery and intensive care in London.

Our PICU has state of the art equipment and facilities to allow development of new treatments and management strategies for critically ill children. More than 90% of all children and infants admitted to PICU are ventilated.

We have a number of ventilators to allow different ventilatory techniques appropriate to the care of the child. A full range of renal replacement therapies are also available should any child require it.

Our staff on PICU is acutely aware of the stress suffered by parents and relatives of children who are admitted to the unit and has developed a large support network. We have a team of family liaison nurses, a play specialist, accessibility to interpreters, social workers and psychological support for those who need it. This network is constantly assessed by parents and relatives in our regular Parent Satisfaction Surveys and we aim to continuously improve the services we provide.

Organisational Structure



The Team

(as at 31 March 2009)

Management and Clerical

Jackson, Liz – Clinical Unit Chair
Smerdon, Tom – General Manager
Metson, Sarah – Operational Manager
Winyard, Anna – Operational Manager
Henderson, Sarah – Business Manager
Parkes, Carol – PA to Consultants
Smith, Paula – Medical PA

Consultant Intensivists

Agrawal, Shruti
Brierley, Joe
Lister, Paula
Mok, Quen
Peters, Mark
Petros, Andy (Lead)
Pierce, Christine
Skellett, Sophie

Fellows/Registrars

Chan, Alex
Deho, Anna
Frijns, Lucas
Heineking, Beatrice
James, Chris
Judd, Genevieve
Naik, Monica
Neshat, Samira
Nuehsmann, Anja
Plunkett, Adrian
Raffaj, Dusan
Ramachandra, Geetha
Scheffczik, Jutta
Sinha, Ruchi
Storey, Liz
Thia, Lena

NICU

Darby,Darren – Modern Matron
Stopp, Stopp – Ward Manager
Abaleke, Eugenia – Clinicians Assistant

Sisters

Davies, Rebecca
Hart, Emma
Linger, Annabel
Pierce, Lorraine
Warner, Lindsey
Wilson, Sarah

Nurses

Velasco, Alvin
Webb, Kirstin
Weber, Marion
Wilson, Charlotte
Abella, Maria-Teresa
Akwah, Nana
Andrews, Summer
Baker, Nikki
Baltazar, Frances
Bowley, Joanne (Bank)
Breet-Smith, Verna
Bricteux, Caroline
Burdack, Sabine
Chambers, Ria
Cluett, Laura
Cooper, Camilla
Didmead, Sarah
Divinagracia, Rosselle
Doyle, Helen
Forbes, Marianne
Hall, Nicola
Harris, Jennifer
Hart, Kirsty
Hubble, Debbie
Hubines, Perben
Ireton, Joanna
Jensen, Pernille
Kanyanga, Caroline
King, Charlotte
Kirk, Claire
Koch, Annaline
Koek, Cheng
Kurtzner, Carmen
Lewis, Alesha
Maguire, Sarah
McCann, Rachel
Mulhall, Tara
Murphy, Liane
Nesbitt, Laura
Peacock, Emma
Pennock, Carrie
Perry, Annick
Peterkova, Michaela
Rakytova, Viera
Randall, Adele
Rokahr, Paul
Scully, Paula
Sedlbauer, Monika
Sheehan, Kelly
Soulsby, Deborah
Stafford, Gayle
Tan, How Yee
Tipping, Anita
Marote, Ana
Marsh, Carly
McKee, Helen
Miles, Jo

Woods, Emma
Wright, Doreen (Bank)
Wyatt, Rachael

PICU:

Darby, Darby – Modern Matron
Ward Manager – Vacant
Harris, Emma – Clinicians Assistant

Sisters

Chalkey, Sharon
Foggo, Bea
Harding, Yvette
Jim, Jo
Lees, Deborah
Park, Lucy
Poulter, Angela
Sturgess, Emma
Taberner-Stokes, Alison
Tollady, Benie

Nurses

Allen, Amy
Allonby, Jane
Baldwin, Claire
Bowen, Rachel
Brown, Jo
Cottrell, Carly
Dale, Ben
Dibbins, Julie
Drach, Evelyn
Duff, Ann-Marie
Dunn, Sonia
Eve, Seb
Fallows, Helen
Flanagan, Emily
Fox, Eithne
Foxhall, Aime
Fraser, Claire
Garwood, Jo
Hierl, Catrin
Horgan, Patrick
Ismay, Gemma
Jog, Agnes
Jones, Amy
Keen, Rebecca
King, Haydee
Le Breuilly, Juliet
Lear, Catherine
Longland, Della
Makewell, Eve
Mansfield-Sturgess, Simon
Parkinson, Alison
Pearson, Nicola
Peto, Rebecca
Prendergast, Helen
Pritchard, Jason
Prodger, Sara
Rose, Anne
Ryan, Julie
Scully, Paula
Shah, Sheena
Summa, Ravinder
Tarr, Sam
Vance, Kari
Volmer, Anja
Waddington, Heather
White, Francesca
Whitehurst, Emma
Wright, Fran
Wright, Joanna
Zinyemba, Jesscah

Family Liaison Team

Laing, Nikki
Rose, Esther
Scales, Angie
Shroff, Petra
Waddington, Heather

Practice Educators

Dettmar, Katie
Miller, Suritha
Roberts, Cathy
Woodward, Elizabeth

Health Care Assistant

Eki Omoruyi

Housekeeping

Agyekum, Gladys – PICU
Mateus, Nazare – NICU

Affiliated Staff

Beckwith, Claire – Senior Vent Technichian
Booth, Rachelle – Pharmacist
Conniff, Harriet – Clinical Psychologist
Highe, Lorraine – Lecture Practitioner
Hines, Sarah – Lead Physiotherapist
Horn, Venetia – Pharmacist
Penn, Lizzie – Play Specialist
Rathwell, Annette – Neonatal Nurse Advisor

Summary of Annual Activity

Admissions

ADMISSIONS TO NICU BY SPECIALTY DURING THE PERIOD 01 APRIL 2008 – 31 MARCH 2009

Diagnostic Group	Patient Episodes	Bed Days	Mortality	Internal Emergencies	External Emergencies	Elective
BMT	1	5	1	1	0	0
CARD	77	342	3	2	40	17
DERM	2	8	0	1	1	0
ENDO	1	6	0	1	0	0
ENT	24	160	0	1	10	13
GAST	2	6	0	0	1	1
HAEM/ONC	1	1	0	0	1	0
ID	3	8	0	0	3	0
IMM	0	0	0	0	0	0
META	19	259	2	3	15	1
NEPH	4	9	1	2	2	0
NEUR	12	51	1	2	6	4
NEUS	22	82	1	2	12	8
ORTH	0	0	0	0	0	0
PLAS	0	0	0	0	0	0
RESP	50	345	4	7	43	0
RHEU	0	0	0	0	0	0
SURG	243	1609	24	34	180	29
UROL	18	98	0	3	7	8
Corrected Total	**399**	**2530**	**31**	**48**	**278**	**73**

ADMISSIONS TO PICU BY SPECIALTY DURING THE PERIOD 01 APRIL 2008 – 31 MARCH 2009

Diagnostic Group	Patient Episodes	Bed Days	Mortality	Internal Emergencies	External Emergencies	Elective
BMT	11	74	3	6	4	1
CARD	26	72	2	2	19	5
DERM	8	45	0	2	6	0
ENDO	6	17	1	3	3	0
ENT	58	230	0	16	18	24
GAST	10	32	2	9	1	0
HAEM/ONC	50	287	8	26	20	4
ID	57	183	8	7	50	0
IMM	11	62	4	2	7	2
META	23	95	8	4	19	0
NEPH	25	97	1	13	7	5
NEUR	91	311	4	25	54	12
NEUS	94	309	12	17	72	5
ORTH	30	46	0	4	0	26
PLAS	8	12	1	1	2	5
RESP	219	1177	10	59	148	12
RHEU	3	6	0	1	1	1
SURG	89	363	3	26	36	27
UROL	12	32	0	4	2	6
Corrected Total	**708**	**2847**	**54**	**183**	**405**	**120**

All figures cited are at first calculation; they may change after further scrutiny by the PICANET team.

Each patient event has a main diagnostic group and occasionally two (e.g. respiratory and ENT in a child admitted for establishment of long-term ventilation). Some diagnostic groups overlap with critical care and may not necessarily reflect the activity of the sub-specialty. For example, we may treat a child with pneumonia (respiratory diagnostic group) but not necessarily involve the respiratory team.

Corrected totals represent individual patients, their route of admission (internal/external emergency or elective) and their length of stay, without double counting those patients in two diagnostic categories

The tables include our regular diagnostic categories.

Referrals

NICU

Of 399 patients admitted during the period 01 April 2008 – 31 March 2009

- 48 were internal emergencies
- 278 were external emergencies
- 73 were elective procedures

PICU

Of 708 patients admitted during the period 01 April 2008 – 31 March 2009

- 183 were internal emergencies
- 405 were external emergencies
- 120 were elective procedures

Re-admissions

NICU

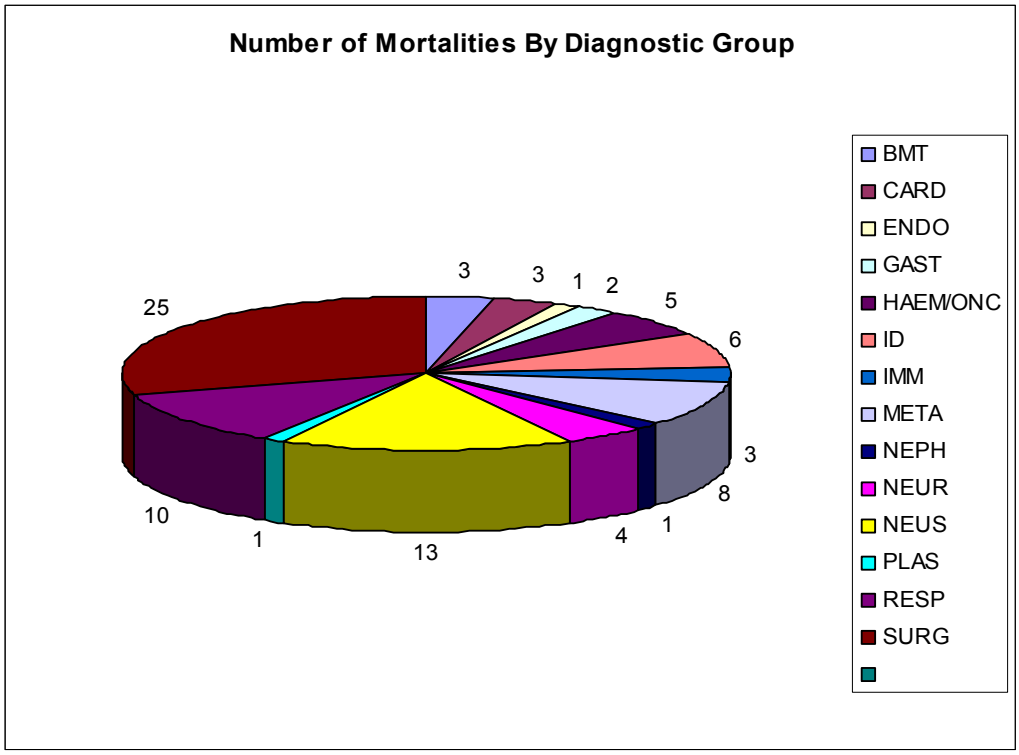
- 8 re-admissions within 48 hours of discharge
- 16 re-admissions within 28 days of discharge

PICU

- 9 re-admissions within 48 hours of discharge
- 19 re-admissions within 28 days of discharge

Mortalities

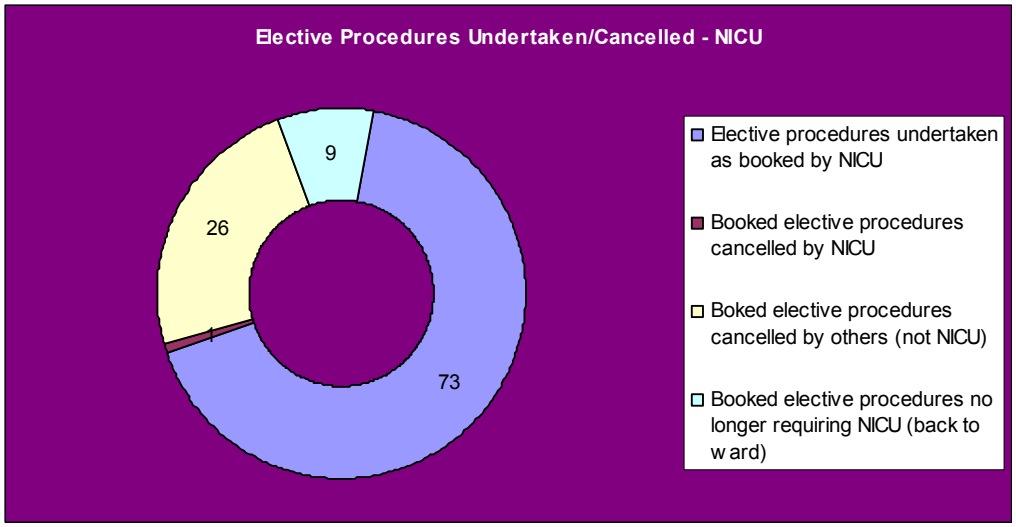
There were 85 deaths during the year. A breakdown of the number of mortalities by diagnostic group is illustrated below.



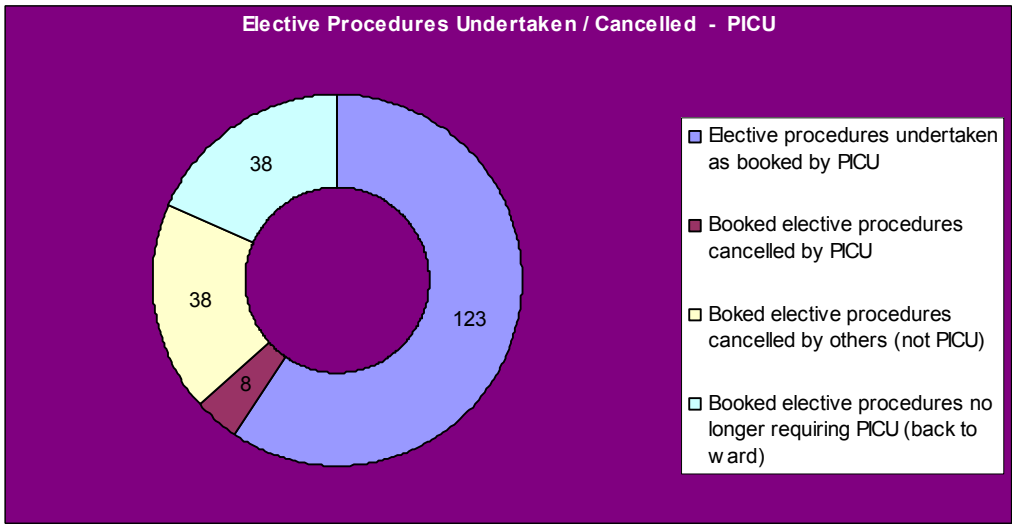
Speciality	Total No. of Mortalities	Mortalities NICU	Mortalities PICU
BONE MARROW TRANSPLANT	3	1	2
CARDIOLOGY	3	1	2
DERMATOLOGY	0	0	0
ENDOCRINOLOGY	1	0	1
EAR, NOSE & THROAT	0	0	0
GASTROENTEROLOGY	2	0	2
HAEMATOLOGY/ONCOLOGY	5	0	5
INFECTIOUS DISEASES	6	0	6
IMMUNOLOGY	3	0	3
METABOLICS	8	1	7
NEPHROLOGY	1	1	0
NEUROLOGY	4	1	3
NEUROSURGERY	13	1	12
ORTHOPAEDICS	0	0	0
PLASTIC SURGERY	1	0	1
RESPIRATORY	10	3	7
RHEUMATOLOGY	0	0	0
SURGERY	25	22	3
UROLOGY	0	0	0

Elective Procedures

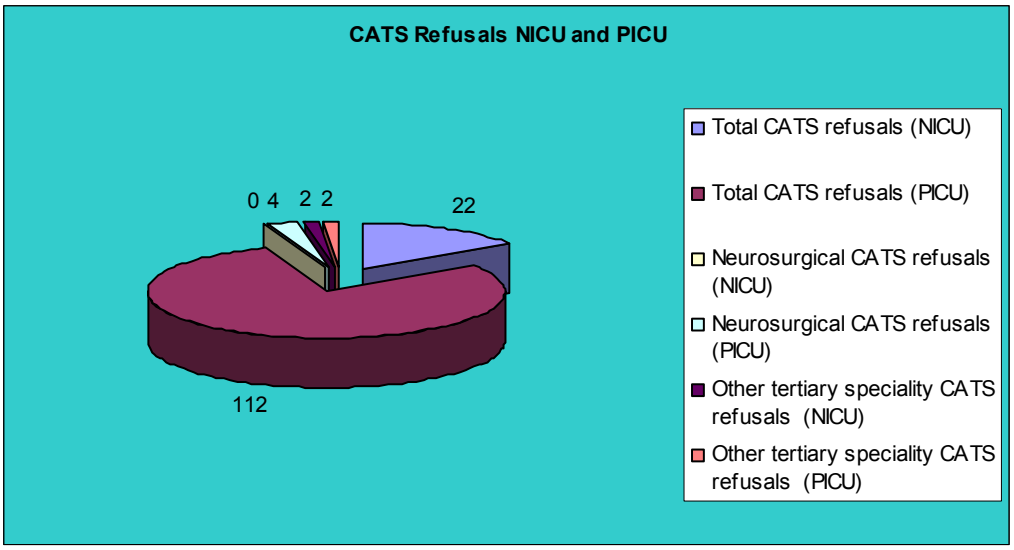
- **NICU**
  73 booked elective procedures were undertaken by NICU
  1 was cancelled by NICU
  26 were cancelled for other reasons (not NICU)
  9 did not require NICU (back to ward)



- **PICU**
  123 booked elective procedures were undertaken by PICU
  8 were cancelled by PICU
  38 were cancelled for other reasons (not PICU)
  38 did not require PICU (back to ward)



CATS Refusals



Data provided by CATS

NICU

Of 22 CATS refusals by NICU

- 0 was neurosurgical refusals
- 2 were other tertiary speciality refusals

PICU

Of 112 CATS refusals by PICU

- 4 were neurosurgical refusals
- 2 were other tertiary speciality refusals

Clinical Governance Pillars

I Risk Management

Risk Summary Paediatric and Neonatal Intensive Care 2008-2009

The Risk Group for Paediatric and Neonatal Intensive care is made up from medical and nursing staff, a pharmacist and a representative of the Patient and Safety Team.

This group reviews critical incidents, maintains the risk register and reports to the specialty and unit boards.

Critical Incident Summary

In 2008-2009, 551 critical incidents were reported between PIC and NIC with all but 30 involving no or minimal harm to patients. Of the harm caused, extravasation injuries were the most common reports (n=9).

The distribution of reported incidents for PIC is shown:

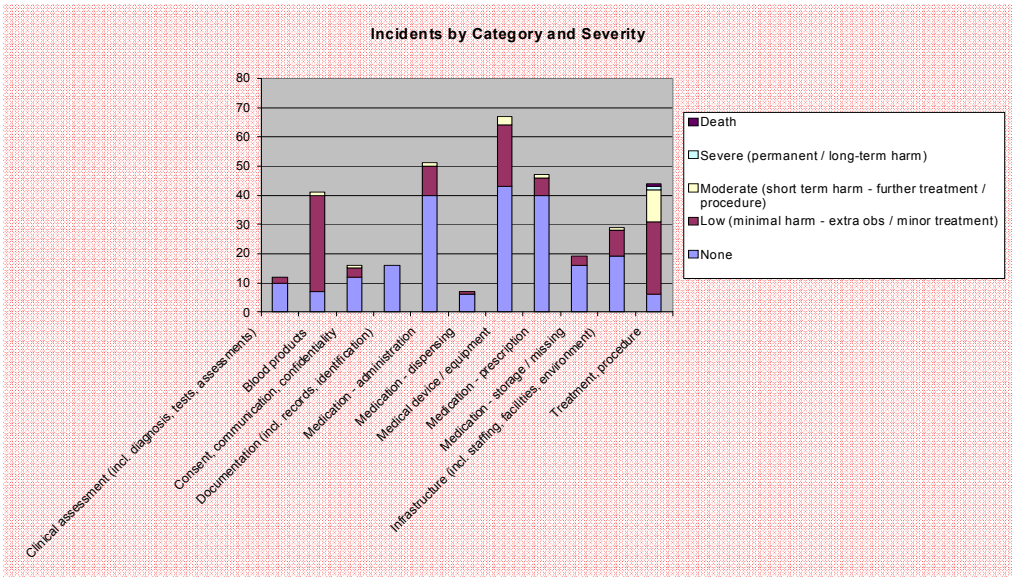
Common themes have been medication errors, communication problems and equipment failure.

The Risk Group has target Prescription Errors and Ward Round Communication as areas for improvement.

Prescription Errors

Rachelle Booth (PICU Pharmacist) and the Consultant Team came up with ways of recording and drawing attention to errors promptly, and Emma Sturgess (PICU Sister) and the Risk Group developed a new approach termed **'Zero-Tolerance Prescription'**.

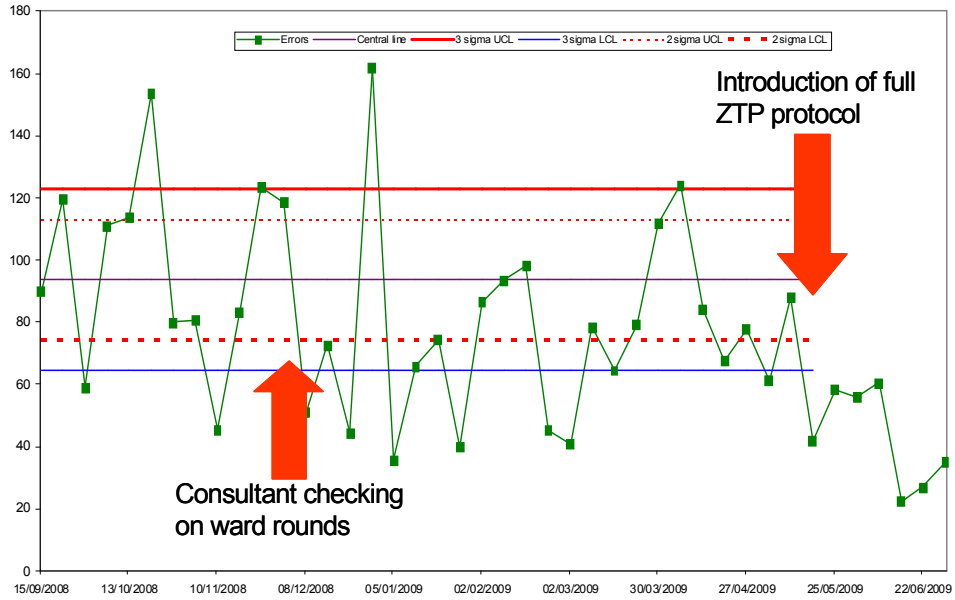
This involves specific Consultant daily review of the accuracy of prescriptions and the whole team enforcing strict new rules concerning where prescriptions can be written and the standards expected.



As a result we have halved the rate of detectable errors against a standard monitoring tool (figure). We are continuing to work to reduce this further.

Elements of this intervention are being considered for adoption around the Trust and a manuscript is being prepared for publication.

Prescription and administration errors per PICU bed day



Communication

Intensive care ward rounds are complex and multiple issues simultaneously compete for staff attention. We have introduced a simple checklist for use at every bed space. As the team finishes discussion at the bedside, the patient's nurse reads the checklist back to the ward round to summarise the plans on the main issues and compares the plan to agreed evidence-based standards. This simple list is typically completed in 30-60 seconds and subjective has greatly improved the subjective quality of information transfer during ward rounds. We are now extending this development to NICU and working on objective assessments.

Current form of bedside checklist:

D – DNAR status reviewed and clear
E – Endotrachael tube (fixation / cuff/ position)
F – Fluids / Feeding strategy
A – Analgesia / Sedation reviewed
U – Ulcers – gut and skin
L – Lines out
T – Tidal volume <7mls/kg

Serious Untoward Incidents

Four SUI were report and investigated. Two involved late PIC recognition and referral, one care after PIC discharge and only one predominantly PIC issues. In this case simple procedures had not been followed and further training and clarification of guidance has been put in place.

Complaints

One compliant concerning consistency of Consultant communication of a poor prognosis was received. Further revision of discharge procedure has been made to reduce the likelihood of recurrence.

II Research and Audit

Hospital Acquired Infection

- VAP project has 'transformed' rates on the Unit from 5.6 per 1000 ventilator days to zero day since the last year
- Central line infection bundles also effective rates NICU and PICU now <2/1000 line days (from 6/1000 two years ago, and 18/1000 ten years ago)
- Naked below the elbow policy – better, but need more enforcement…
- Hand-washing – big area to improve on

Organ Donation Rates

GOSH ICU Potential Donor Audit January 2008 – April 2009

- 79 deaths
- 12 potential to donate
- 4 donated
- 3 parents refused
- 2 arrested pre testing
- 1 had tests > body removed (religious reasons)
- 1 died during testing
- 1 consented but did not donate (no suitable recipient due to blood group)

Audits Undertaken

Audits registered with the Trust include:

NICU

- PDA – Emma Hart, Joe Brierley
- Parent Support Network NICU – Angie Scales
- Newborn Bloodspot Screening – Annette Rathwell
- Neonatal Pain 'Assessment Tool' – Emma Hart and Joe Brierley
- CVC post bundle audit – Suritha Miller, Joe Brierley, Katharina Schumacher

PICU

- Can collar be removed from patients – Geetha Ramachandra, Mark Peters
- Parental involvement in ward rounds – Claire Milne, Christine Pierce. Data collection 08/08/2008 being collected
- Out of hours radiology contact – Claire Milne, Joe Brierley
- PICANET – PICU audit and Geralyn Oldham
- BLS Training compliance - Darren Darby
- Questioning the weight equation – Lucy Park
- VAP audit – All staff fed back to transformation
- CVC infection – Joe Brierley, Katharina Schumacher, Lorraine Highe. Post bundle audit just starting

Case Note Reviews registered with the Trust include

- TPA – indications for use and dose in the past 10 years – Shruti Agrawal
- Invasive Pneumococcal disease pre and post vaccine introduction
- CVVH and RRT on PICU, NICU and CICU
- Study of patient journey (categories of care) in patients who die in a one year period
- CDH patients – description, outcome, associated abnormalities and looking for prognostic indicators
- Usefulness of 360° appraisals on ICU

- Outcome of children arrested outside hospital and admitted to ICU versus children arrested on wards at GOSH – any change in the last five years
- Audit usefulness guidelines on PICU and NICU
- Audit comparing incidence of pressure ulcers before and after the implementation of a pressure care team; data collected from January 2004 – January 2006 and January 2007 – January 2009.

III. Education and Training

There is an ongoing teaching programme for the North Thames Paediatric Intensive Care trainees, which consists of weekly teaching modules and monthly core curriculum, incorporating the ICTPICM curriculum, in addition to regular informal teaching on a daily basis during ward rounds and patient care. The education and training pillar is an operational role to ensure that there is adequate training provided to the registrars conforming to the ICTPICM curriculum for paediatric intensive care. It provides some education and teaching opportunities to the nursing staff as well.

The formal teaching program runs in collaboration with the two other PICU's in North Thames, i.e., Royal Brompton and St. Mary's Hospital.

Teaching Modules

The ICTPICM curriculum is divided into 50 modules, which are peer reviewed and updated every two years. There is a module for every week, which provides educational material and information regarding resources available for reading around the topic. The aim of the modules is to enhance self-directed and reflective learning. The trainees get an opportunity to update the modules with consultant supervision. The modules offer different educational material for year one and year two trainees.

The trainees are also expected to send MCQ's based on the modules every month and there is an MCQ based exam once a year. All the modules are available on the hospital intranet and circulated by email every week.

Core Curriculum Teaching Day

This is a monthly teaching day, which compliments the modular teaching. There is a multidisciplinary full day teaching program organized to cover the ICTPICM curriculum and involves experts from within and outside the hospital in the respective fields. There are opportunities for senior trainees and senior nursing staff to gain teaching experience during these sessions.

Journal Club/ Mortality & Morbidity/ Research Days

These weekly sessions are organized in collaboration with the junior doctor representatives, providing opportunities to critically appraise journal articles and discuss mortalities.

Hospital Teaching Sessions

The trainees are encouraged to attend the anaesthetic teaching sessions and Grand round.

Multidisciplinary Meetings

Multidisciplinary meetings with different specialties within the hospital are held every two months.

Anaesthetic Training

All trainees are given anaesthetic training in theatres to learn airways skills.

Over the past year, we have tried to restructure the educational opportunities. This has been facilitated

by the expansion of the junior doctors' rota.

Certain new sessions have been introduced with a focus on:

Basics of PICU

- Ventilation workshop: twice a month
- Resuscitation workshops: twice a month.
- Use of equipment on PICU: sonosite, Uscom etc. once a month

Informal Dialogue on the Week's Module

- A weekly presentation by one of the registrars on a study day, moderated by the support consultant for the day.

Ward Round Teaching

- To encourage clinical problem based discussions. Every day, one of the short day registrars is asked to read up on a short topic related to patients present on the floor and discuss that before the evening ward round.

Presentations at Various Conferences/ Meetings

- Presentations are kept in a folder on the hospital intranet for easy access.
- We have reinforced the attendance in the teaching sessions and this is periodically fed back to the individual trainees by their educational supervisors.

The evaluation carried out showed that the trainees were very satisfied with the introduction of the new teaching sessions and have rated them as being very useful.

IV Staffing and Management

Doctors and Nurses

We are funded for 10 NICU cots and have 61 nursing staff at various bands.

Similarly, we are funded for 11 PICU beds. For a large proportion of the year 1 bed has been closed almost on a continuous basis due to maternity leave.

However, we were able to over-recruit and our complement is now up to 100%

We have a complement of 8 Consultants and 29 Junior Doctors, 4 of which are grid posts.

Psychological Support

There is currently a Clinical Psychologist employed half time and a bid in for another half time post. The psychologist provides input to families of children where either the family have requested this input and/or there is a more complex presentation (e.g. for longer stays, child awake on ward or family members experiencing high levels of distress). The psychologist also provides staff support in groups to each band level of nurses, provides supervision to senior nurses and runs reflective practice groups to registrars and consultants. She offers support for staff immediately following incidents on the ward on an individual basis and facilitates group discussions around difficult cases and issues. She also is involved in teaching on the ward and further afield and undertakes research and audits.

Family Liaison Nurses

We have 3.5 nurses who provide an invaluable role in helping parents through difficult times while on NICU/PICU.

V Clinical Effectiveness

Clinical effectiveness is concerned with providing evidence-based guidelines for all staff on PICU and NICU to use as appropriate for patients on the units at GOSH.

We currently have all guidelines on a drive on the Intranet accessible by the medical and nursing teams working on ICU. The nursing staff record all their patients' observations on a computer system called Carevue and so can also use their computer stations to access the Unit's guidelines.

We currently have 75 ICU specific guidelines on the Intranet and several CPC and Pharmacy guidelines are cross-referenced for ease of access. Of the 75 guidelines, 60 have been written or updated within the last three years. Work is continually ongoing to update all guidelines as new evidence arises or as part of a regular review.

A recent audit to investigate the usefulness of the guidelines on the Unit revealed that many staff were not aware how to access them, so work has been done to improve this, particularly for new nursing staff on the unit. Medical staff are shown how to access them at induction. The audit revealed that of the staff that used the guidelines, 92% thought them very or extremely useful and used them regularly. Suggestions for new guidelines that may be of benefit are always welcome from all levels of staff.

Work is slowly progressing to move some of the guidelines onto the Internet so that our practice can be shared. The Clinical Practice Committee (CPC) for GOSH approves all guidelines published to the Internet, and specialised training is needed to be able to write the web pages. One of the PICU secretaries is to go on a training course to help us proceed with this project.

Other new developments include the closer collaboration with the Neonatal Intensive Care team at University College Hospital (the Lead Centre for our Neonatal Network) in developing guidelines for the NICU. This year we have developed guidelines for use of Insulin in VLBW babies with hyperglycaemia and revised the phototherapy guidelines. Next year promises to build on this early work.

VI Parent & Public Involvement

Family Liaison Service on PICU/NICU

October 2003 saw the introduction of the Family Liaison Service on PICU/NICU. The original development of the service was initially both parent and staff driven; feedback showed that staff were often too busy caring for the critically ill children to devote as much time to the family as was often required.

The Family Liaison team comprises three full time equivalent nurses providing practical and emotional support to parents, carers and other family members. A comprehensive psychosocial team is also now able to address the needs of the family as a whole unit, from admission to intensive care, during their stay, through to

discharge from the unit and the transition to ward care.

A vital part of the role has been the evolving service for bereaved families; this involves support for families before and after a death and at home in the weeks that follow. The liaison team also provides support and advice to staff on the Units, as well as being a Trust-wide resource for issues related to bereavement.

The family liaison nurses in collaboration with the psychosocial team continually review the services they provide; they actively seek feedback from the user group and aim to adapt the services according to the needs of the families.

There have been some very positive results in the following areas:

- Increased donations to support the units
  Alteration of types of referrals to the Patient Advocate Liaison
- Service – referrals are actively supported by the Liaison Team
- Positive feedback from families
- Increased bereavement follow up

The Liaison Team has also had the opportunity to share knowledge about the services at international conferences.

As well as supporting families, the Family Liaison Nurses are developing other services for families and patients, such as:

- Outreach within the hospital for planned ICU admissions
- Facilitating antenatal visits from referring hospitals for planned ICU stays
- Information production – parent computer/internet access
- Ensuring adequate family facilities are available in the ICU
- Facilitating the ICU Parent Group – providing regular support meetings
- Parent Telephone Support Network – there are now 15 fully trained supporters
- Designing and distributing a yearly newsletter
- Organisation of the yearly Past Patients' party
- Staff support
- Teaching
- Discharge planning and co-ordination for long term children

Following discharge from ICU, the Team is also available to families and staff to attempt to ease the transition from the Intensive Care Unit to the ward, local hospital or sometimes home.

Past Patient Party

The annual Past Patients' Party and Support Group took place in July in Coram's Fields. The event was very well attended by those who had been patients on the Units the year before and their families. Entertainment was provided by Bubbles the clown, face-painters and a magic show.

It concluded with a surprise visit by Zoë from BBC's Blue Peter, then prizes and party bags kindly donated by Disney, Warner Brothers and Harrods were handed out.

The party was preceded by the annual parent support group, giving parents an opportunity to talk about their experiences, with trained professionals on hand. The families were also actively encouraged to offer feedback, which is vital in the continuing improvement of our service.

It was wonderful to see so many children progressing well and enjoying life again following their stay in Intensive Care.

VII Use of Information

PICANet dataset continues to be collected on all ICU admissions. The annual report was published and for the first time the 2008 data was available for the paediatric and neonatal intensive care units analysed separately from the cardiac ICU.
PICU and NICU continues to have approximately 1000 admissions per year, with 60% <5 years of age and the majority falling in the PIM mortality risk groups of 1-15%.

The team continues to work with the National Neonatal Audit Project to allow interface of data relevant and specific to neonatal patients.

The team continues to provide data for various medical and nursing audit and research projects carried out on the units.

Recording of the now mandatory Paediatric Critical Care Minimum Dataset (PCCMDS) went live on TOMCAT in April 2008. This data will eventually be used to calculate PbR payments for ICU bed-days.

Any further development towards a more complete TOMCAT ICU module is currently not progressing following Philips takeover of the product.

The scheme for replacing the old computers and printers in the ward and office areas progressed over the last two years, with additional memory provided to enable efficient use of the digital dictation programme.

Staff Presentations and Publications

Presentations

Agrawal S, Hulme S, Heywood R, Brierley J. A portable CT Scanner in the Paediatric Intensive Care Unit Decreases Transfer-associated Adverse Events and Staff Disruption. PICS, Cardiff 2008

Agrawal S, Brierley J. Optic Nerve Sheath Measurement and Raised Intractanial pressure in Paediatric Traumatic Brain Injury. 2nd Congress of the European Academy of Paediatrics, Nice, October 2008

Agrawal S, Hulme S, Brierley J. Decreased Critical Incidents in Severe Traumatic Brain Injury Using a Portable Scanner. Annual Conference of Pediatric Intensive Care Society, Cardiff, November 2008 (poster presentation)

Peters M. Sepsis Resuscitation. Fluid Therapy in Paediatric Septic Shock." "Management of Severe Paediatric Diabetic Ketoacidosis**:** Reval Hotel Latvija, Riga, Latvia. *2* Plenary Lectures*:* 4th International Baltic Congress Of Anaesthesiology And Intensive Care, December 2008

Peters M. Neuroprotection / Updates in Sepsis / Coaguloapathy on PIC: The Indian National Conference of Paediatric Intensive Care, Mumbai, 3 Plenary Lectures, November 2008

Peters M. Hypothermia for Paediatric Head Injury: South West Paediatric Intensive Therapy Annual Meeting. Bath, August 2008

Publications

Chapters/Reviews

Bould EJ, and MJ Peters. The 2-month-old with severe pertussis (whooping cough). In P Murphy, SC Marriage and PJ Davies, editors Case Studies in Paediatric Critical Care*,* Cambridge Medicine, 134-141

Lutman D, and MJ Peters. Trauma and Transport in R Bingham, A Lloyd-Thomas and M Sury, editors Hatch & Sumner's Textbook of Paediatric Anaesthesia, 3rd Edition Hodder Arnold, London, 635-645

Peters MJ. General Considerations: Intensive Care Neonates. In Pierro and Davenport, editors Oxford Specialist Handbook of Paediatric Surgery, Oxford University Press ISBN 978-0-19-920880

Peters MJ**.** General Considerations: Intensive Care Neonates. In Pierro and Davenport, editors Oxford Specialist Handbook of paediatric Surgery*,* Oxford University Press ISBN 978-0-19-920880

Peters MJ. General Considerations: Intensive Care – Children. In In Pierro and Davenport, editors Oxford Specialist Handbook of paediatric Surgery*,* Oxford University Press ISBN 978-0-19-920880

Allen M, N Klein, and MJ Peters. The Immune System in M. Helfaer and DG Nichols, editors Rogers' Handbook of Pediatric Intensive Care, 4th edition, Lippincott Williams & Wilkins, Philadelphia. 433-440. ISBN 9780781787055

Allen M, N Klein N, and MJ Peters. The Immune System. In DG Nichols, editor, Rogers' Textbook of Pediatric Intensive Care, Lippincott Williams & Wilkins,

Philadelphia, 34:433-440. ISBN 978-0-7817-8275-3

Brierley J, JA Carcillo, K Choong, T. Cornell, A Decaen, M Peters, et al 2009. Clinical Practice Parameters for Hemodynamic Support of Pediatric and Neonatal Septic Shock: 2007 update from the American College of Critical Care Medicine 3. Crit Care Medicine: 2009, 37:666-688. PMID: 19325359

Brierley J, MJ Peters. Distinct Hemodynamic Patterns of Septic Shock at Presentation to Pediatric Intensive Care in Pediatrics*:* 2008 Oct; 122(4):752-9. PMID: 18829798

Colville G, S Kerry, and CM Pierce. Children's Factual and Delusional Memories after Intensive Care in The American Journal of Respiratory Critical Care Medicine: 2008 May 1;177(9):976-82.

Evans P, and MJ Peters. Haematology and The Immune System. In Foundations of Anaesthesia, editors KM Kiff and Cathy Spoors, Oxford University Press

Hoskote AU, RA Castle, AF Hoo, S Lum, SC Ranganathan, QQ Mok, and J Stocks. Airway Function in Infants Treated with Inhaled Nitric Oxide for Persistent Pulmonary Hypertension. In Pediatric Pulmonology**:** 2008 Mar; 43(3): 224-35

Mettaur N, S Agrawal, CM Pierce, M Ashworth, and AJ Petros. Outcome of Children with Pulmonary Lymphangiectasis. In Paediatric Pulmonology: 2009; 1-7.

Mettaur N, CM Pierce, MJ Peters, M Alletag, C Huang, SU Kalu, and BJ Sullivan. Index of Suspicion. In Paediatrics in Review**:** 2008 29 (10); 355-61.

Mettaur NL, CM Pierce, P Clayton, and MJ Peters. Newly Diagnosed Urea Cycle Defect in Fifteen-year-old Encephalopathic Patient. In Paediatrics in Review: Oct 2008

Peters MJ, and J Brierley. Back to Basics in Septic Shock**.** In Intensive Care Med: 2008 Jun;34(6):991-3 PMID: 18829798

Steinhorn RH, JP Kinsella, G Butros, M Dilleen, M Oakes, CM Pierce, and L Wessel. Intravenous Sildenafil in the Treatment of Neonates with Persistent Pulmonary Hypertension of the Newborn. In Journal of Paediatrics: 2009

Willems J, A Petros, and J Brierley. Enzyme Replacement Therapy for Infantile-onset Pompe Disease: Curse or Cure? In Neurology: 2008 Jul 29;71(5):380-1.

Mettauer NL, CM Pierce, MJ Peters, A Alletag A, C Huang, SU Kalu, and BJ Sullivan. Index of Suspicion. In Pediatrric Review: 2008 Oct; 29(10):355-61. PMID: 18829772

Peer Reviewed Articles in Journals/ Press

Eisen DP, MM Dean, MA Boermeester, KJ Fidler, AC Gordon, G Kronborg, JF Kun, YL Lau, A Payeras, H Valdimarsson, SJ Brett , WK Ip, J Mila MJ Peters, S Saevarsdottir, JW van Till, CJ Hinds, and ES McBryde. Low Serum Mannose-binding Lectin Level Increases the Risk of Death due to Pneumococcal Infection. In Clinical Infectious Diseases*:* 2008 Aug; 15;47(4):510-6 PMID: 18611155

Hall NJ, M Hiorns, H Tighe, MJ Peters, AK Khoo, S Eaton, and A Pierro. Is Necrotizing Enterocolitis Associated with Development or Progression of

Intraventricular Hemorrhage? In American Journal of Perinatology: 2008 Feb; 26(2):139-43. PMID: 18979411

Lister P, MJ Peters, and AJ Petros.

Effects of Blood Sample Volume on Hematocrit in Critically Illl Children and Neonates. In Paediatric Anaesth. 2008 May; 18(5):420-5

Plunkett A, RS Agbeko, K Li, SE Humphries, NJ Klein, and MJ Peters.

Angiotensin-converting Enzyme D Allele Does Not Influence Susceptibility to Acute Hypoxic Respiratory Failure in Children. In Intensive Care Med. 2008 Dec; 34(12):2279-83. PMID: 18787808

Wakeland W, R Agbek, K Vinecore, M Peters, and B Goldstein. Assessing the Prediction Potential of a Computer Model of Intracranial Pressure Dynamics. In Critical Care Med. 2009 Mar; 37(3):1079-89 PMID: 19237921

Achievements

Grants

Investigators	Title	Duration	Funder / Amount
Lister P, Peters MJ, Klein NJ	Clinical safety and efficacy study of Protein C concentrate in neonates with NEC	2009 – 2011	Baxter Healthcare £167,000 + £150,000
Khadem FV, Mok Q	Neural and physiological markers of antisocial behaviour in adolescents	2007	Kids Company £70,950
diCarlo J, Mok Q	Multicentre observational study in acute respiratory failure following bone marrow transplant	2007 - 2008	Leukemia and Lymphoma Society USS400,000
Mok Q, CATCH Trial	A randomised controlled trial of central venous lines in children	2009 - 2011	National Institute of Health Research Health Technology Assessment £1.8 million
Pierro A, Eaton S, Alexander N, Klein NJ, Peters MJ, Goldman A, Allen M	Regulation of Monocyte function – understanding postoperative immunoparalysis	2007 - 2008	Royal College of Surgeons of England £60,179
Pierro A, Eaton S, Peters MJ, Hall NJ	Therapeutic controlled hypothermia in the treatment of neonates with severe necrotizing enterocolitis	2007 - 2009	The Children's Research Fund £100,000
Eaton S, Pierro A, Peters MJ, Klein NH	Hyperglycaemia and endothelial function in neonates with necrotizing enterocolitis	1 year	The Children's Research Fund £64,000

Academic Achievements

Dr Quen Mok made Honorary Reader in the UCL Portex Unit of Anaesthesia and Intensive Care in 2008

Dr Mark Peters was awarded a Senior Lectureship in 2009

Dr Mark Peters was appointed Chair of Scientific Study Group, Paediatric Intensive Care Society United Kingdom

Future Plans

Education

- To expand the practical teaching session: fluid and electrolyte/ haemodynamic support/ practical procedures and equipment use, etc. once a week.
- To set up in-hospital simulation sessions
- To initiate case based discussions
- To establish the e-learning modules and online presentations so that people can participate from home and use it later if missed due to other commitments
- To encourage the senior trainees and practice educators to participate in teaching
- To identify ways to give bleep free teaching sessions every week to meet the trust's target

ICON

The Intensive Care Outreach Network (ICON) is a new Trust initiative in conjunction with the paediatric intensive care unit.

The aim is to work with all the surgical and medical teams in the hospital to provide an extra source of help for the acutely deteriorating child. The team has been operational since 14th September 2009.

There is considerable experience from the adult world of medical emergency teams (MET teams) providing ICU outreach to wards in their hospitals and the subsequent reduction in ICU admissions. Whilst a Cochrane meta analysis did not show improved overall outcomes with respect to mortality for adult MET's, more recent work has shown that the lack of benefit appears to occur when the teams are not always called upon early enough due to lack of recognition of the acutely deteriorating patients. We are hoping that the ICON team can work closely with all staff and particularly the Clinical Site Practitioners (CSP's) in the hospital to both recognise and intervene when a child becomes acutely unwell.

The ICON team is made up of senior ICU trained fellows and an ICON consultant. The team will aim to provide 24 hours, 7 days a week cover. The ICON consultant will be available during the weekdays and the on-call PICU/NICU consultant will cover the service at nights and weekends.

Either the lead consultant for the deteriorating child or the CSP will be able to call the ICON team and request a consult. A junior doctor or nurse can also call the ICON team, providing the lead consultant and/or CSP have also been consulted and agree.

The ICON team will be happy to review any deteriorating patient if requested and give advice and suggest interventions that may help. There may also be occasions when it may be appropriate to discuss whether ICU would be the best environment for the child and the ICON team would be happy to work with the local team in conjunction with the Symptom Care team if needed.

An ICON fellow will now also be on the Clinical Emergency Team (CET) 1 with the CSP remaining as Lead for the CET.

The ICON team is also a resource to provide interested teams with teaching, perhaps at local unit meetings, on recognising and treating sick children, teaching resuscitation updates etc.

It is the Trust's hope that the ICON initiative will provide significant backup for sick children within the hospital by early recognition and prevention of deterioration.

Contact:
ICON Consultant Dr Katharina Schumacher (mobile via switchboard)
ICON Fellows Bleep 0522
Email: iconfellow@gosh.nhs.uk

Thanks and Acknowledgements

A special thanks to the parents who gave their kind permission to reproduce the photographs from the past patients' party.

Thanks to CATS for providing refusal data and to all those who contributed articles to this report.

The annual report was compiled and produced by Carol Parkes, with the help of Eugenia Abaleke and Emma Harris.