SUMMARY

- 309 children were admitted to the unit during the year 2006.

- In the year 2006, the retrieval team agreed to 104 requests for retrieval.

- There were no refused admissions WITHIN Wales due to the lack of an available staffed bed during the winter period of peak demand.

- The development of the Paediatric Critical Care Network has continued with multidisciplinary audit and feedback sessions held in all Trusts. The regional Practice and Development Nurse has been invaluable in progressing education and training within the network. The "Stabilisation of the Critically Ill Child" Study Days continue to evaluate well, as are the nursing secondments.

- The partnership between the Lead Centre PICU and the Welsh Burns Centre in Morriston Hospital continues.

- The UK Paediatric Intensive Care Audit Network Database (PICANet) has published its fourth report (www.picanet.org.uk).

CONTENTS

CHAPTER 1

THE LEAD CENTRE PAEDIATRIC INTENSIVE CARE TEAM

Dr Helen Fardy	Lead Clinician Paediatric Critical Care Service
Mrs Bernie Steer	Lead Nurse Paediatric Critical Care Service
Mrs Paula Davies	Clinical Nurse Leader Paediatric Critical Care Service
Dr Rim Al-Samsam	Consultant in Paediatric Intensive Care - responsible for Audit and Research
Dr Malcolm Gajraj	Consultant in Paediatric Intensive Care - responsible for Education and Training
Dr Damian Pryor	Consultant in Paediatric Intensive Care - responsible for Clinical Risk
Dr Mark Price	Consultant in Paediatric Intensive Care/Anaesthesia - responsible for Anaesthetic Training
Dr Allan Wardhaugh	Consultant in Paediatric Intensive Care - responsible for Unit and Retrieval Audit
Dr Dawn Edwards	Staff Grade in Paediatric Intensive Care
Ms Alison Oliver	Regional Training & Development Co-Ordinator for Paediatric Critical Care Services in Wales
Mrs Jessica Castle	Directorate Manager Critical Care Services
Miss Mererid Jones/ Miss Kate Williams	Senior Physiotherapists
Mrs Sue John	Dietician
Zoë Taylor	Pharmacist
Mrs Pat Davies	Personal Assistant to Lead Clinician
Sonia Mancisidor Sue Tullett	Secretary Audit Clerk

CONTACT NUMBERS:

Dedicated Retrieval Line	Tel:	029 20745413
Consultant via long range bleep	Tel:	029 20747747 (via switchboard)
Pat Davies PA to Dr Helen Fardy	Tel:	029 20746423
Email:		Pat.Davies@Cardiffandvale.wales.nhs.uk

CHAPTER 2

THE SERVICE

Our service has been developed based on multidisciplinary teamwork both within the Lead Centre and with our Paediatric, Anaesthetic and Emergency Medicine colleagues in the District General Hospitals throughout Wales.

Consultant Staff

This is the third year the service has benefited from a full and stable team following the final appointment to the funded posts in 2003.

The future depends on the implementation of the new consultant contract and plans for relocating the unit within Phase 2 of the Children's Hospital for Wales, which is currently in progress.

Specialist Registrars

The Paediatric Intensive Care Unit has a dedicated rota of resident specialist registrars – three from the Welsh Paediatric Rotation and two from the Welsh Anaesthetic Rotation. This provides an important part of the training of paediatricians and anaesthetists of the future.

Training is provided in the recognition and care of the critically ill child, as well as safe transport of the critically ill child (the principles of which are transferable to adult and neonatal practice).

A key component of a centralised service is the requirement for resuscitation and stabilisation locally, prior to retrieval by PICU. It is therefore essential that junior staff, the consultants of the future, learn about critically ill children during their time in PICU. Much of this knowledge will be gained from direct experience managing patients, but given the limited time, shift working and variable patient numbers, this experience must be backed up by a rigorous educational programme.

Our junior staff are provided with guidelines and a self-directed programme, still in development, but which has been well received by the specialist registrars. This encourages independent study and strengthens understanding. Teaching ward rounds and a formal grand round once a week provide practical and specific knowledge, backed up by weekly tutorials on a wide curriculum pertinent to PICU.

Advanced airway skills are essential to medical staff working in intensive care. Without a patent and secure airway, all other medical interventions become irrelevant.

At the start of their attachment trainees attend a lecture and practical tutorial utilizing training mannequins. This helps emphasize the difference in anatomy, technique and equipment between infants, children and adults.

Paediatric trainees then spend time with a consultant anaesthetist, in the operating theatre. Here a range of airway management techniques, including endotracheal intubation, can be taught under close senior supervision and monitoring.

Theatre attachments used are those with exposure to multiple cases that require more involved airway management. A good example is day case Ear, Nose and Throat surgery. To maximize training both adult and paediatric lists, without any other trainees, are utilized.

The feedback from our trainees has been positive.

However, due to the changes in the anaesthetic training programme, it is becoming increasingly difficult to organise these attachments as it will interfere with the training of the anaesthetic trainees.

We would like to thank all the anaesthetic consultants involved for their time and interest.

Recruitment of anaesthetic specialist registrars continues to be difficult and we are working with the Regional Advisors to try and address this.

Nursing Staff

2006/2007 has yet again, produced another year of growth and development in the nursing workforce of PICU. Recruitment and retention is extremely proactive, with a current vacancy factor of 6% and turnover rate of between 8-11%, comparing very favourably with UK PICS turnover rates of 12-15%. Our recruitment strategy spans attracting a number of newly qualified as well experienced critical care staff to the team. Our comprehensive induction programme, together with our continued commitment to the paediatric critical care rotational programme, provides staff with an interest in paediatric critical care with unique and exciting opportunities to develop their skills and knowledge in this area.

Retention continues to focus on Trust wide initiatives, such as work life balance, with an increasing number of flexible ways of working, together with distinctive succession planning and retrieval programmes. Our commitment to training and development is unending and at this time we are about to embark in an exciting new partnership with University of Central England in Birmingham, bringing paediatric intensive care training closer to our patients and staff.

In line with the Welsh Assembly Government standards (2003) Caring for the Critically Ill Child our progress is as follows:

- 98% of all nursing staff are paediatric/child health trained.
- Staffing standards state 70% should be trained in paediatrics, we are currently well above the standard.
- 39% of which are trained specifically in paediatric intensive care. We are aiming for 50% as specified in the standards.
- The shortfall of 11% in nurses trained in paediatric intensive care will be addressed in 2007/2008 while undertaking the training in partnership with Birmingham.

So another year is nearing its end and we continue to grow and develop the skills and knowledge of our nursing workforce to ensure that every critically ill child and their family in Wales, continue to receive a first class service.

Pharmacy Report

Postholder – Ms Zoë Taylor
Clinical pharmacy role on PICU

A specialist clinical pharmacist visits PICU every day Monday to Friday. Their role is to promote the safe and effective use of medicines. All medications for every child are reviewed daily to check that they are appropriate for the age, weight and clinical condition of the child. The pre admission drug history will be checked with the parent/carer, GP or referring hospital.

Throughout the child's stay on PICU the pharmacist will advise on:

- Therapeutic drug monitoring,
- Drug dose adjustments in renal and hepatic failure
- Drug interactions
- Suspected adverse reactions to drugs
- Formulations of medicines
- IV compatibility issues
- Parenteral nutrition

The pharmacist will also provide advice in the preparation of guidelines and protocols, help with drug related audits, review any medication incidents and help with education and training.

To ensure as seamless care as possible, the pharmacist will contact the paediatric pharmacist from the ward or referring hospital that the child returns to once they leave PICU to hand over any pharmaceutical issues and answer any questions.

The pharmacist's role is to work as part of the multidisciplinary PICU team to ensure the best care possible for our patients.

The Physiotherapy Service

Postholders – Miss Mererid Jones
Miss Kate Williams

The specialist physiotherapy service to the unit is led and delivered by Mererid Jones PICU/Respiratory Paediatric Physiotherapist (Band 7) and Kate Williams PICU/Trauma & Orthopaedic Paediatric Physiotherapist (Band 7) with input from other specialist senior Paediatric Physiotherapists where indicated eg: neuro and oncology. Monday-Friday 8.00am – 4.30pm

Physiotherapy is provided on Saturday, Sunday and Bank Holidays via an emergency duty rota 9.00am – 4.30pm and a bleep service between 4.30pm – 7.30am (with a scheduled evening service 7.00pm – 10.30pm).

There is ongoing clinical education for the Physiotherapy staff to ensure consistent standards of Physiotherapy across the 24 hour period. Teaching sessions for SpRs and new nurses regarding the role of physiotherapy in PICU are being undertaken as part of their induction programme.

Dietician's Report

Postholder – Mrs Sue John

Nutrition and dietetic advice is provided on the morning ward round 5 days a week with every child on the unit receiving a review. An analytical software programme has been introduced. This has benefited the unit by streamlining the provision of enteral feeds and allows a profile of macro and micro nutrients of all enteral feeds to be given on request. This ensures that the child's nutritional requirements are being met. The rolling educational programme continues which highlights the importance of nutrition. The dietician continues to liaise with colleagues both within and outside the Trust to guarantee a seamless service.

Family Bereavement Support

Laura Thomas, Sister - PICU

Family support remains a priority within PICU. We continue to audit the service we provide for children and their parents through written and verbal feedback and by direct observation of care.

In November 2006, we held our fourth annual memorial service to remember the children who had died on PICU which was very well attended. Many staff members were involved in the organisation and in reading poems and prayers.

It was good to see many parents returning for the fourth year, who take comfort from the opportunity to remember their children, and meet other parents at this annual event.

CHAPTER 3

THE REGIONAL PAEDIATRIC CRITICAL CARE SERVICE

Regional Education and Training Report

Alison Oliver
Regional Training and Development nurse for PIC Services in Wales

It has been a difficult year for all colleagues in the region this year with the ongoing effects of agenda for change and the proposals of designed for life, having far reaching consequences for all who work in the field of paediatric care.

A commitment from Nurse Managers to release staff despite financial pressures on education has meant that the nurse secondments have continued and have very positive feedback. The medical secondments continue to be available to all levels and specialties of medical staff.
Nurse management teams have been enthusiastic to meet and discuss developments in their clinical areas especially skills required to provide "high care beds" so that therapies such as CPAP can be provided in the ward environment.

The National Stabilization Days were provided again this year and were evaluated well. Grateful thanks goes once again to our colleagues in other paediatric intensive care services that help us in the provision of the course. Preparation is already underway for this year's course.

A successful study day was provided in Carmarthen NHS Trust this year and thanks goes to the ICU practice educator for facilitating this.

Multidisciplinary feedback sessions have been held in all trusts and have been informative and beneficial for all members of the referring and retrieval teams.

Ongoing meetings have occurred with our commissioners with the hope of commencing the managed clinical network in the model agreed in line with the CYPSS project in 2007. Nominations have been agreed from both North and South Wales for the nursing and medical teams.

Pre and post registration nursing sessions have continued with both Swansea and Cardiff University. This year sessions were provided with the University of Central England for the first time and it is hoped that in the forthcoming year those links will be strengthened to provide further training between both centres.

EDUCATION – Dr Malcolm Gajraj

The unit continues to believe that education is an essential in the running and success of a good clinical network, and that this should permeate through every level. We value feedback from every activity we undertake and have changed and improved in many areas.

One of our consultants has recently completed a postgraduate diploma in medical education and plans to move this forward with completion of a research-based dissertation to achieve a Masters degree. The benefits of this are being realised locally, with enhancement of the in-house SpR programme; greater relevant input into the nurse development programme; improved evaluation of our teaching activities. In addition, Cardiff can be better represented at a national level, with the newly formed PICS-SG for education for PIC medicine.

The unit continues to contribute to wider programmes. Cardiff University runs MSc courses in critical care, and peri-operative care, both of which benefit from input from PICU, in terms of teaching, mentoring and assessment. One student is currently in the process of researching outcomes in meningococcal disease as a dissertation. Mentor and marker for this are both from within PICU in Cardiff.

Another MSc course run by Cardiff University is in child health. A new module "Care of the critically ill child" has been developed by Malcolm Gajraj and Colin Powell (Child Health, UHW) and was recently delivered for the first time. This was a highly successful venture, earning excellent evaluations.

We continue to provide input into the child health lectures for medical students and the success of SSMs from last year has meant that this continues, exposing young medical students to paediatric critical care early. One student was so pleased with the support he received before, he requested a second SSM with us.

Regional support remains a priority. Every consultant has sessions available for education out with PICU, in their link hospitals. Such sessions, arranged on an ad hoc basis, have continued to prove popular. These, in addition to the retrieval feedback sessions have contributed to the high and continually improving level of resuscitation and stabilisation throughout our region. This standard must remain and in many respects, Wales is 'ahead of the game' with regard last year's Tanner report. We need to continue to support this through appropriately targeted education.

Stabilisation of the Critically Ill Child Course - Mark Price
4th & 5th May 2006 City Hall , Cardiff

Organisers: Dr Mark Price and Dr Allan Wardhaugh

In May of last year this two day national course was run within the historic environs of the City Hall, Cardiff. The format was a mixture of lectures and small group teaching.

The course aims to provide education and guidance on the initial management of the critically ill child presenting to a District General Hospital. Consultant and senior trainees from anaesthetics and paediatrics attended from all geographical points within the United Kingdom.

The course was rapidly oversubscribed and the feedback and final structured evaluation were extremely positive. This was the second successful running of the course, with a future course to be held at the same venue in 2007.

The following contact numbers may be of use to staff that need access to courses outlined in the Standards:

Resuscitation Officer – Gwent APLS	Angela Barber Royal Gwent Hospital Newport Tel: 01633 234234
Resuscitation Co-ordinator APLS	Kate Graham University Hospital of Wales Cardiff Tel: 029 20748297
Resuscitation Officer APLS/PALS	Cheryl Thomas Ysbyty Gwynedd Bangor Tel: 01248 384384
Resuscitation Officer- PALS	Harry Stephens Prince Charles Hospital Merthyr Tel: 01685 721721
Resuscitation Officer	David Edwards Wrexham Maelor Hospital Wrexham Tel: 01978 727409
Child Health Education	Peter McNee Eastgate House Newport Road Cardiff Tel: 029 20927732
Child Health Education	Carwyn Earles University of Swansea Sketty Road Swansea Tel: 01792 295789

REGIONAL NETWORK MEETINGS

The following table shows the details of all the Study Days, Multidisciplinary and Nursing Meetings held:

HOSPITAL	Multi Disciplinary Visit	Nursing/ Medical Visits	Study Days
Singleton Hospital	21st April 2006		
Morriston Hospital	21st April 2006		
Royal Glamorgan Hospital	16th March 2006 19th October 2006	27Feb 2006 10 May 2006	10 April & 24 May 2006 21 Sept 2006
Princess of Wales Hospital	25th July 2006	23 May 2006	
West Wales General Hospital	28th September 2006	8th May 2006	20th Sept 2006
Withybush General Hospital	28th September 2006	8th May 2006	20th Sept 2006
Prince Phillip Hospital			
Neath/Port Talbot Hospital			
Prince Charles Hospital	20th July 2006		
Nevill Hall Hospital	No date arranged	22 June 2006	
Bronglais Hospital		14 July 2006	
Brecon Memorial Hospital			
Royal Gwent Hospital	7th July 2006 1st December 06	2nd Feb 2006	
Glan Clwyd Hospital	N/A		
Ysbyty Gwynedd Hospital	N/A		
Wrexham Maelor Hospital	N/A		
Alder Hey Hospital	N/A		

As can be seen from the table, multidisciplinary meetings have been held with all our referring hospitals. These have enabled clinicians to clarify issues in relation to the service and make suggestions on future developments as well as providing the opportunity to discuss referred/retrieved patients. These meetings will continue on a yearly/twice yearly basis depending on the number of referrals from each hospital.

Future Plans for the Network

Each PICU Consultant is linked to a group of hospitals. He/She is responsible for arranging the joint audit and feedback session at that hospital.

HOSPITAL	DGH LINK	PICU LINK
Singleton Hospital	Ingo Scholler	Rim Al-Samsam
Morriston Hospital	Rachel Evans/ Wynne Rogers	Rim Al-Samsam
Royal Glamorgan Hospital	Lynne Millar-Jones	Damian Pryor
Prince Charles Hospital	David Deekollu	Damian Pryor
Princess of Wales Hospital	Nirupa d'Souza	Damian Pryor
Bronglais Hospital	John Williams	Allan Wardhaugh
West Wales Hospital	Vinay Saxena	Allan Wardhaugh
Withybush Hospital	Gustav Vas Falcao	Allan Wardhaugh
Prince Phillip Hospital	via West Wales	Allan Wardhaugh
Neath/Port Talbot Hospital	via Singleton	Rim Al-Samsam
Nevill Hall Hospital	Marcus Pierrepoint	Malcolm Gajraj
Royal Gwent Hospital	Marion Schmidt	Malcolm Gajraj

Children & Young People's Specialised Services Project (CYPSS)

We, in line with paediatric colleagues across Wales continue to work with the CYPSS with the aim of developing the "informal" network we have set up over the past 6 years from the lead centre into a formal Managed Clinical Network.

The existing All Wales Paediatric Critical Care Group has been revamped and now has North Wales and South Wales sub groups. The South Wales group will meet for the first time in May 2007. The table below outlines representation of the group :

Helen Fardy	Lead Clinician	PICU
Bernie Steer	Lead Nurse	PICU
Alison Oliver	Regional Training & Development Nurse	PICS in Wales
Marcus Pierrepoint	DGH Link Paediatrician	South East (nominated by WPS)
Eryl Owen	DGH Link Nurse	South East (nominated by Senior Nurse Forum)
Vishwa Narayan	DGH Link Paediatrician	South West (nominated by WPS)
Eirlys Thomas	DGH Link Nurse	South West(nominated by Senior Nurse Forum)
Lloyd Harding	Adult ITU Consultant	WICS Representative
Grant McFadyen	Consultant Paediatric Anaesthetist	PAGW Representative
Vicky Goodwin	Consultant A & E	Prince Charles Hospital
TBA	Ambulance Representative	Nomination awaited via HCW
TBA	Contact a Family parent representative	Nomination awaited via HCW
TBA	MCN Co-ordinator	HCW/WAG
Pat Davies	PA to Dr H Fardy	Admin Support

CHAPTER 4

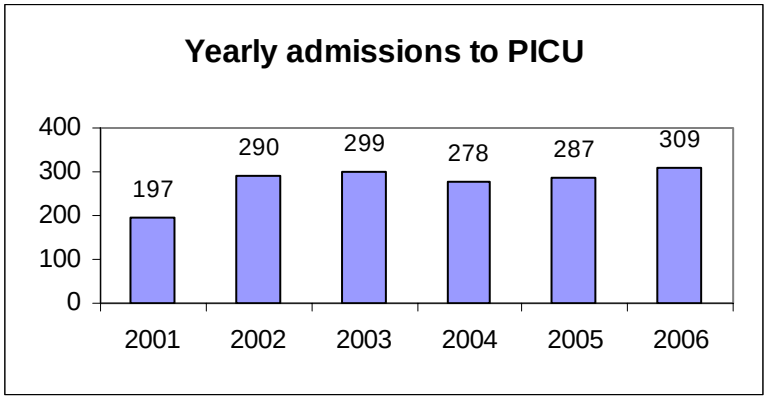
UTILISATION OF THE LEAD CENTRE PAEDIATRIC INTENSIVE CARE UNIT

PICU inpatient activity

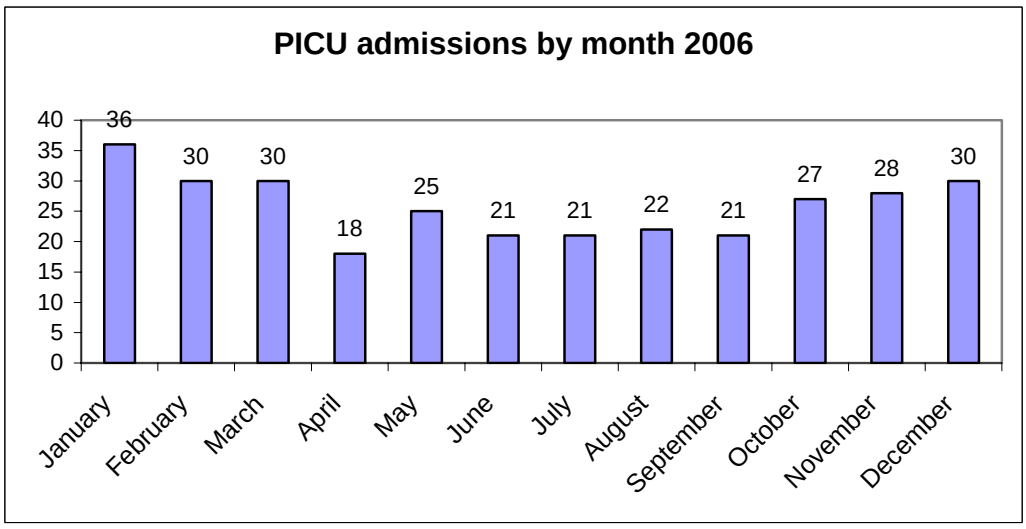
The data presented here are those for the period 1st January – 31st December 2006.

Overall admissions

A total of 309 patients were admitted to PICU, an increase of 22 in the last report

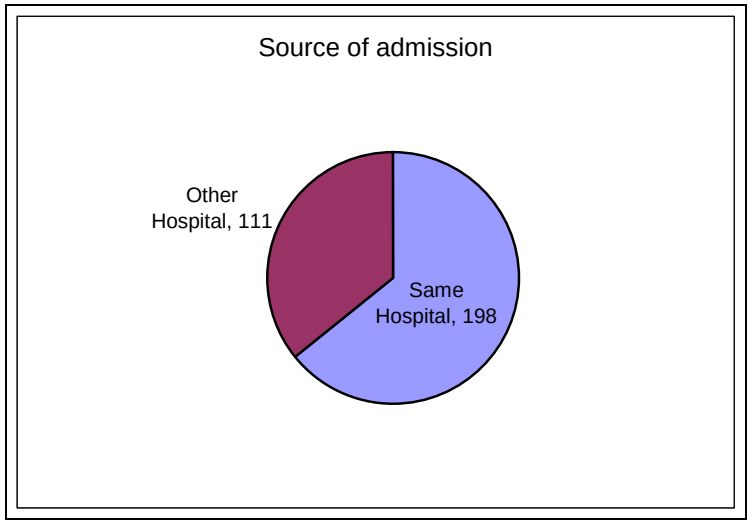


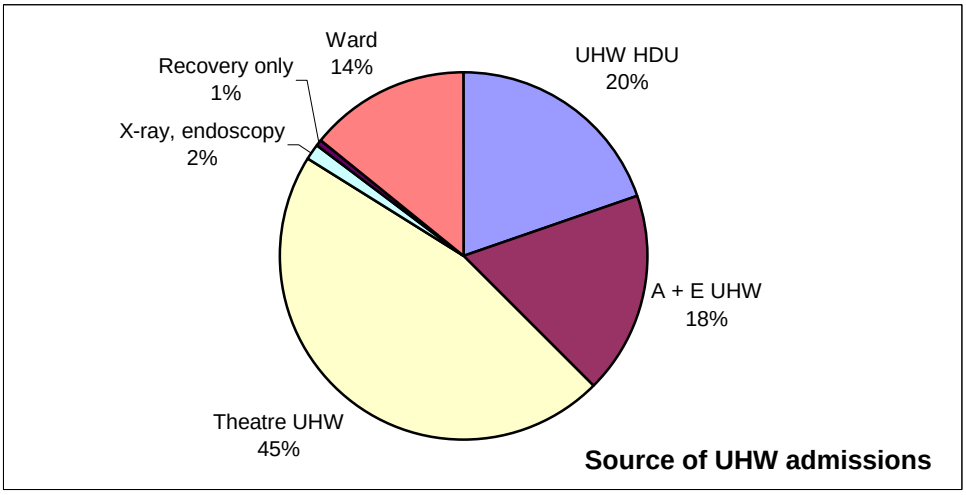
The monthly admission figures are shown below.



Source of admission

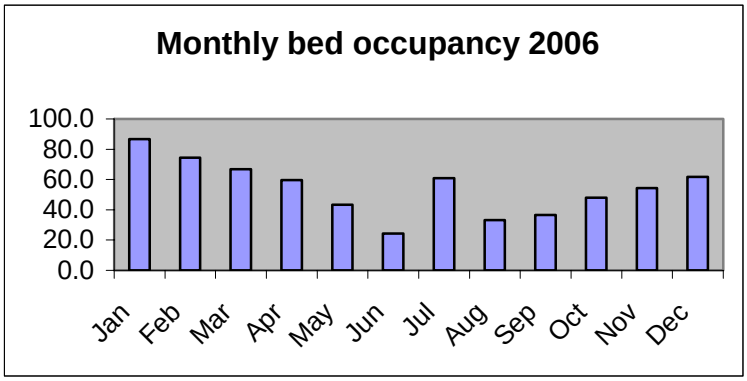
The trend in recent years has been for an increasing proportion of patients to come from within UHW compared to regional units. We are not clear if this reflects a change in referral pattern from regional hospitals. We plan to examine post code data to see if patients are still coming proportionately from the same areas, but are being admitted to UHW at an earlier stage in their illnesses. We are not aware of changes in elective surgical practice which might account for a difference.



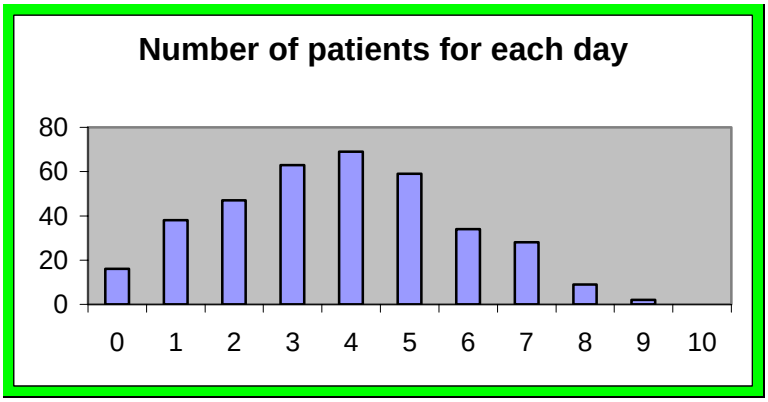


BED OCCUPANCY

Occupancy is shown below. Again, this reflects the marked winter peak in admissions.



The occupancy figures are often below 60% during the summer months, but this is a consequence of the need to accommodate seasonal swings in demand. The unit remains commissioned for 6 beds and an additional bed to allow a retrieval with the flexibility to expand to 8 beds with an additional retrieval bed. This flexibility has enabled the service to remain open on every day this year, with us not having to turn down any admissions. On 11 days there were more than 7 patients and on 28 days there were exactly 7 patients. Without the flexibility therefore, the service would have been "closed" on 39days of the year.



Length of stay

The median length of stay remains 2 days, with an interquartile range of 1 – 4 days. Some patients remain much longer – 15 patients had stays of 14 days or longer, and 2 patients had stays of over 60 days.

Outcomes

Crude mortality

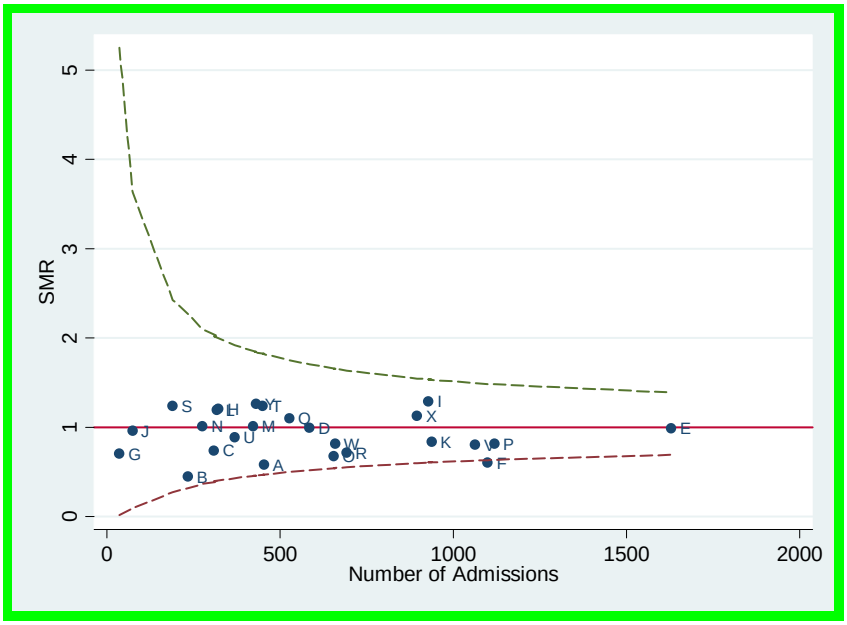
There have been 14 deaths on PICU in the last year. This gives a crude mortality rate of 4.7%. The crude mortality in the last PICANet interim report for all participating units is 5%.

The crude mortality rate does not take account of illness severity and case-mix. This is adjusted for using the Paediatric Index of Mortality (PIM), from which a standardised mortality ratio (SMR) can be calculated. A SMR of less than 1 means there were fewer deaths than the PIM model predicted. The table below shows the SMR for the last 7 years data, and allows the calculation of the cumulative SMR for the unit.

Year	Crude mortality rate	SMR
1999-2000	5.60%	**0.56**
2000-2001	5.30%	**0.63**
2001-2002	3.80%	**0.40**
2002-2003	6.40%	**0.63**
2003-2004	6.80%	**0.67**
2004-2005	6.70%	**0.58**
2005	5%	**0.64**
2006	4.5%	**0.74**

PIM is inaccurate for calculating SMR if the number of expected deaths is less than 20, so the annual SMR is less reliable than the cumulative SMR. However, analyzing cumulative SMR over a long period of time may mask a relatively sudden change in mortality rate. PICANET data show our cumulative SMR for 2004-2006 is 0.70.

The following graph is from the PICANet report 2006 giving a UK perspective of outcomes using PIM.

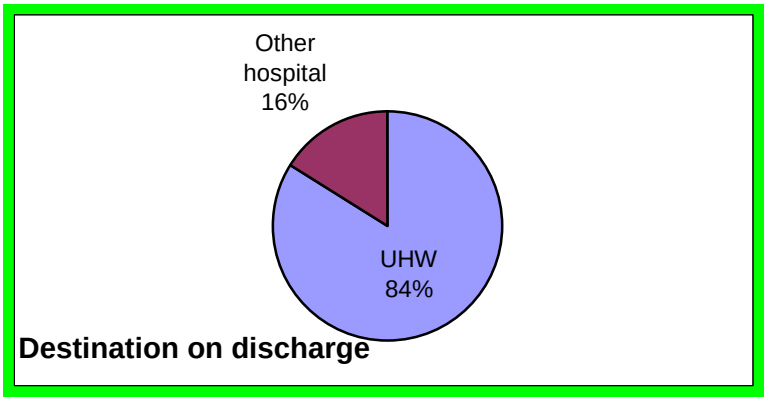


PICU risk adjusted (PIM2) standardised mortality ratios by NHS Trust with 99.9% control limits 2006.

Cardiff PICU is 'C' on the graph.

Destination on discharge

Our aim is to discharge children back to their referring hospital as soon as possible. However, the majority are discharged to care within UHW, usually for continuation of tertiary input. There seems to be a trend against discharge to referring hospital.



[1] Paediatric Intensive Care Audit Network, MRC Unit Sheffield, June 2007.

CHAPTER 5

PAEDIATRIC HIGH DEPENDENCY CARE AT THE LEAD CENTRE

In December 2006, a planned disaggregation of Paediatric High Dependency [PHDU] took place. This change now means that the PHDU functions independently of the other services based on the same clinical ward, and works in partnership with the Paediatric Intensive Care Unit [PICU]. The PHDU now has a designated nursing and medical team.

This has been a major step forwards towards a final integration of the workforce. Therefore despite the 2 units being geographically separate and in separate Directorates, both now function as a combined Paediatric Critical Care Service.
The PICU Consultants share the medical rota with their General Paediatric Consultant colleagues.

A post for a Clinical Nurse Leader has been appointed to, and this is jointly funded by both the Critical Care and Child Health Directorates. The aim of this post is to provide continuity in clinical leadership across the Paediatric Critical Care and in the communication with both Directorate teams.

In addition, the PHDU now has a fully funded establishment of nursing staff led by a recently appointed Team leader. The Team leader has recently undertaken a placement on the PICU and the Band 5 / 6 nurse rotation continues.

Training needs are currently predominantly based on further development of critical care skills and staff in both PIC and PHDU continue to undertake relevant courses in addition to utilising in house training opportunities. This further development of critical care skills amongst staff [together with the funding for equipment] has enabled patients to continue treatment within the PHDU when deemed appropriate.

PIC / PHDU operational meetings are held regularly with attendance from both Directorates clinical and management teams. An admission criteria guideline produced by the Lead Clinician for PHDU has been implemented, and an escalation protocol has been formulated and is followed when there is a need to flex up beds to meet peaks in demand.

CHAPTER 6

THE RETRIEVAL SERVICE

Retrieval and Transport activity

The consultant delivered retrieval service continues to perform well. There are 6 consultants delivering medical input, 12 nurses and 5 ambulance crew. Our commissioned remit is to be able to offer retrieval for 95% of the year. This is largely due to the good will of our nursing staff in providing cover for the service beyond their required commitment. We are continuing to train more nursing staff to undertake retrievals, so we should become less reliant on staff sacrificing their time off.

159 calls were made to the service to discuss retrieval, and 104 cases were retrieved by the PICU team. The ratio of referral calls to retrievals seems to be steadily falling. This may reflect experience of the service and educational outreach work in referring hospitals, which means fewer advice calls are needed, and calls tend only to be made when PICU is required.

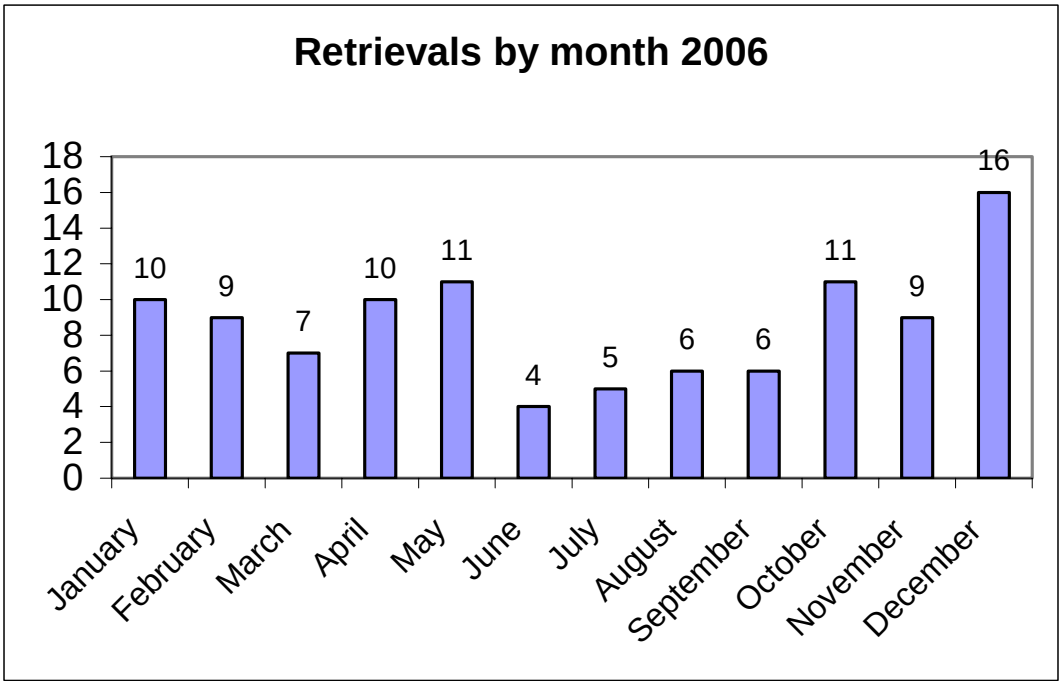
9 cases were transported to PICU by the referring hospital – 1 was a patient transferred from another PICU, the other eight were transfers where urgent surgery was required and referring team transfer was undertaken to expedite this.

No retrievals from Welsh hospitals were refused because of lack of staff or beds. One retrieval request received via Bristol Children's Hospital had to be declined because there were insufficient staff to release a team.

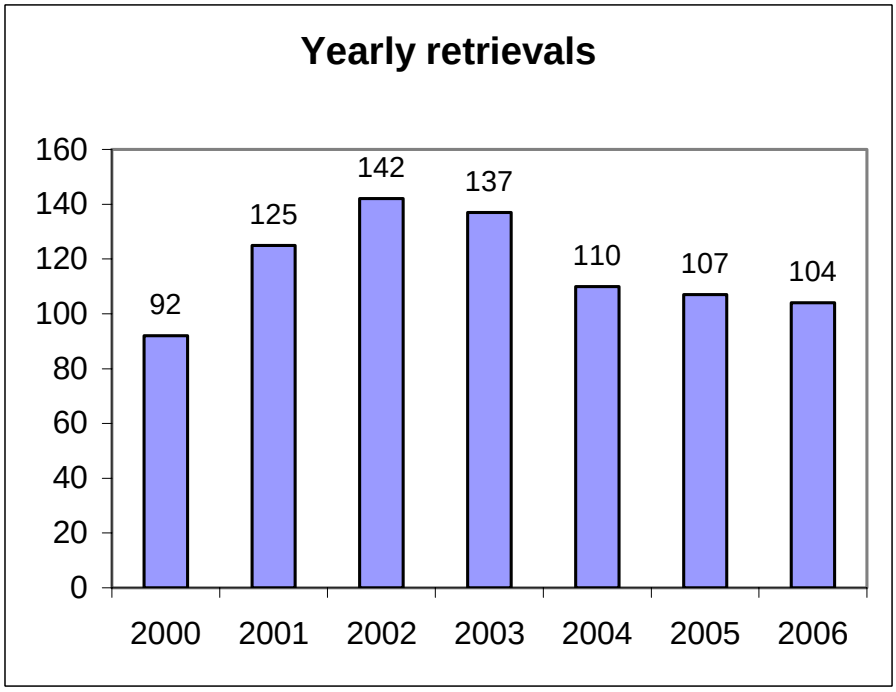
	Retrieval by UHW	Retrieval refused - no team available	Retrieved by other PICU	Referring hospital transfers	Died before retrieval	Advice only - remains referring hospital	Grand Total
Patient episodes	**104**	**1**	**0**	**9**	**2**	**43**	**159**

Seasonal variation

As with admissions to the unit, there is a marked peak in the winter months. This is seen nationwide, and is almost solely due to bronchiolitis in infants.

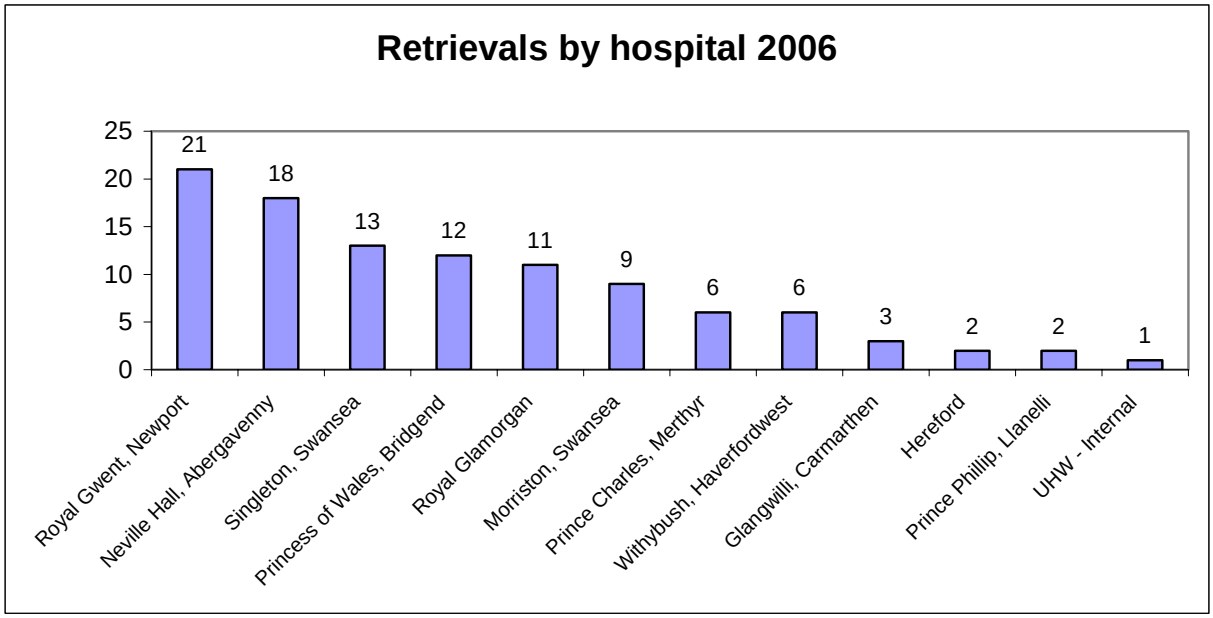


The annual trend in retrievals continues downwards, but the rate of decline is slowing.



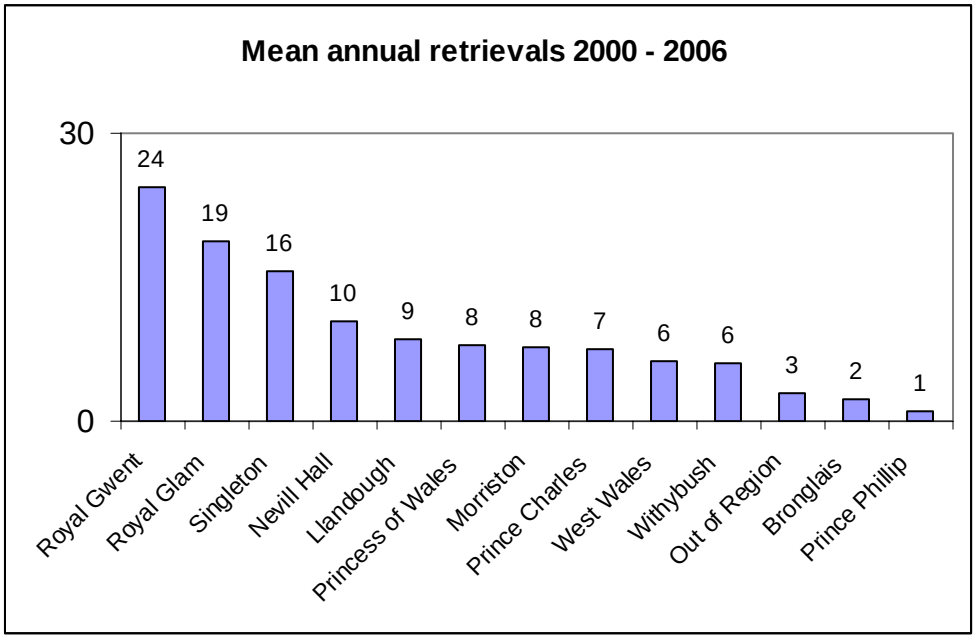
Retrievals by hospital

The breakdown of retrievals for individual hospitals is shown below.



It will be noticed that one patient was 'retrieved' from UHW. This was a patient transferred from A + E at UHW to the burns unit at Morriston Hospital.

Individual units vary quite considerably from year to year in their referral numbers, reflecting the relatively small numbers of cases involved for each unit. The chart below shows the mean retrievals for each hospital from 1st January 2000 – 31st December 2006. Figures for the first half of the decade are given by financial year. Llandough Hospital ceased to be a retrieval destination in 2005 when its inpatient paediatric unit merged with the new Children's Hospital for Wales.



CHAPTER 7

CLINICAL GOVERNANCE/AUDIT/RESEARCH

RIM AL-SAMSAM

As part of the lead centre audit we continue to collect data for PICANet which are reported earlier in the document. We continue to collect also severity of illness data in the form of the Paediatric Index of Mortality. Our retrieval service is continually audited and we have monthly clinical governance sessions as well as quarterly morbidity and mortality meetings in association with the paediatric department.

Research & Audit:

Ongoing Research Projects from last year:

- ***Cardiff and Vale Paediatric Early Warning System (C&VPEWS).*** **Dawn Edwards, Alison Oliver, and Colin Powell**

Suboptimal care may contribute to physiological deterioration of patients with major consequences on morbidity, mortality and requirement for intensive care. Paediatric Early Warning System to identify children at risk of critical illness might be developed using simple physiological parameters suitable for bedside application.

Two Phase Study:

Phase 1: Validation of the Cardiff and Vale Paediatric Early Warning System.

Phase 2: Effectiveness of a Paediatric Emergency Team activated by a paediatric early warning system.

- ***Correlation of Bilateral BIS with Comfort sedation score in assessing level of sedation in critically ill children.*** **N Goodwin, M Price, M Chawathe, J Mecklenburgh, JE Hall**

Introduction: Adult work has shown BIS scores asymmetry when the right side was compared to the left. Bilateral BIS asymmetry has been demonstrated in children during recovery from anaesthesia, but not examined in Intensive Care. A case series was commenced investigating whether hemispherical asymmetry could be demonstrated in this group. The early data suggest that there is a significant difference between each hemisphere. This could have an impact on assessment of depth of sedation on Intensive Care, when BIS is used.

Completed Non-Core Audit Project:

- ***Referral Criteria for PICU among Children with Existing Chronic Illness*****. Donna Khalil, Helen Fardy, Richard Hain.**

Introduction: In 2004 the RCPCH published guidelines: 'Withholding and Withdrawing Life-Sustaining Treatment'. PICU referral occurs despite indicators that invasive treatment is not in the child's best interest. We aimed to quantify and explore reasons for this.

Method: We identified a gold standard of practice such that in cases where invasive treatment is medically futile, and RCPCH guidelines apply,

withholding of intensive treatment is appropriate. A retrospective audit of PICU referrals between 2000-2005 was performed. We identified PICU deaths where pre-existing severe/life-limiting illness was present. Case scenarios were evaluated by clinicians and ethicists based on RCPCH guidelines.
Results: 91 deaths were identified. 16 cases had severe pre-existing illness. 12 were evaluated through scenarios. Consensus on management was achieved in 10. In 9, treatment was agreed to be futile. 10% of children who died were admitted despite consensus that invasive treatment was not in their best interests. Reasons identified were common to many cases.
Conclusion: Paediatricians should be supported in addressing intensive care/resuscitation options with families, in a timely, opportunistic way. This requires:

1 Raised awareness of RCPCH guidelines via presentation/ publication of findings.
2 Published information for parents based on modified RCPCH guidelines.
3 Identification of trigger events to raise discussion of resuscitation.
4 Guidelines to assist the writing of clinician and parent-held letters outlining agreed end of life management / resuscitation plans.

- ***Medication Error Audit.*** **Alison Oliver, Zoey Taylor, Allan Wardhaugh.**

Background & Aims: Between February 2006 and October 2006 a series of three audits were undertaken on PICU with regard to medication errors. The aim of the initial audit was to assess the number of drug errors that occurred on PIC prior to the introduction of a Zero Tolerance Policy for prescription writing on PIC. The length of the audits was determined by the level of PIC activity, i.e. the audit in February was taken over two weeks, whereas the audit in May was over four weeks.
Method: All drug charts were checked on at least a daily basis to record the number of errors detected by the unit pharmacist or the audit nurse.
Results: During this time a total of 336 errors were recorded, 10(3%) were recorded by PIC staff and 90% recorded by the pharmacist or audit nurse. Over the three phases of the audit, 175 (52%) were administration errors and 161(48%) were prescription errors. Prescription errors reduced between phase one and two (from approx. 50 to 30%) after written information was given to each nurse describing the findings and a presentation was made available on the unit. However there was an increase in overall errors in phase three (55%). Administration errors rose between phase one and two from approx. 50-60% reducing slightly in phase three to 45%.
Areas which require attention:

1. Training needs identified for both nursing and medical staff on PICU
2. These ongoing number of errors are a major clinical risk issue and needs to be addressed urgently
3. Lack of ownership of the PICU team of this audit and the need to resolve these problems urgently

Proposed action for discussion with PICU Senior team:

1. Action is required for both the medical and nursing teams.
2. Senior Nurse has been identified as taking the nursing issues forward with Unit pharmacist

3. Part of this action plan will include the re-assessment of all current PICU nurses who administer IV medication. (Although this is not just IV drugs this is identified as the most urgent area for action).
4. This re-assessment will be followed by a routine six monthly spot check on all staff.
5. Senior nurse will discuss with Education Nurse (current IV assessor and lead in changing the current training to include NMC update, quick reference guides to good practice and refresher training on an annual basis).
6. Identification of a medical lead for PICU to review and revise induction training on medication in PICU.

This draft plan was presented to the PSSM group and discussed at the PSSM meeting in December. The action plan is ongoing.

- **Retrospective audit of unplanned extubations on Paediatric Intensive Care - Findings and Actions. Oliver. A Regional Training & Development Nurse for PIC Services in Wales PIC.**

Background: Unplanned extubations are a recognised and often preventable occurrence in the paediatric intensive care unit. Incident reports highlighted that a number of children had suffered adverse events as a result of their unplanned extubation.
Aim: A retrospective audit of the medical and nursing notes on the 14 children from 2003 to 2005 aimed to identify any areas of practice which have contributed to their unplanned extubation and whether practice can be improved to prevent then occurring in the future.
Method: Notes for the group of identified patients were collected and common factors were examined to see if there were any preventable incidents or trends
Results: The children were variable in age group and the majority of children had respiratory illness. Some children had no or minimal sedation and analgesia despite high ventilatory requirements. There was no greater incidence when the nurse caring for the child was less experienced and more children extubated at night than in the day.
Other findings: Both nursing and medical documentation need improvement. The audit identified a number of areas of practice which required action.
Actions: Nurses require guidelines when utilising patient restraints. All staff requires awareness sessions regarding clinical incident reporting. The Comfort Score used on PICU to assess pain and sedation levels needs to be reviewed and used more effectively.
Developments: These findings have been fed back to the PICU management team. A prospective audit has now commenced and groups have been set up to improve upon both the nursing documentation used and the use of the comfort score on the unit.

New Audit Projects:

- ***A Prospective Audit of the Management of Paediatric Sepsis on PICU.*** **Part of a National Multi-centre Project run by the Paediatric Intensive Care Society.**

Aim: The purpose of this prospective observational study is to review current UK practice in the management of severe sepsis in children for two reasons. Firstly, if systematic deficiencies exist in the early management of sepsis, then it is important to define these in order to design interventions to improve care. Secondly, knowledge of current practice is necessary in order to inform any future randomised controlled trials of albumin, steroids or indeed any other agent in severe sepsis.
Methods: This 6-month study will focus on pre-PICU care in several areas of the UK and participating services will collect clinical information about the children presenting with severe sepsis who are referred to PICU. Information collected will include details of interventions, including airway management, ventilation, fluids, drugs and inotropic support given both before and after arrival at PICU. Severity of illness scoring will be performed using the PIM2 scoring system and outcome data will include PICU mortality and 28 day morbidity.

List of Ongoing Audits:

1. Review of indication of the use of HFOV. Anil Kumar & Allan Wardhaugh.
2. Re-audit of Accidental Extubations in Paediatric Intensive Care.
3. A prospective audit of the adherence with the new TBI guideline protocol, & Max Nathan & Rim AL-Samsam.
4. Retrospective Study of Children Admitted to PICU for Seizure. P R Govindaraj, D. Pryor, R. Al-Samsam.

Many thanks to Pat Davies, Sue Tullett and staff from PICANet for their help in compiling this report and to all the clinical staff who have supported and worked with us over the years.