

**WELSH PAEDIATRIC
CRITICAL CARE
SERVICE**

**ANNUAL REPORT
2009**

SUMMARY

- 352 children were admitted to the unit during the year 2009, 302 of whom were ventilated.
- In the year 2009, the retrieval team agreed to 147 requests for retrieval.
- 3 retrievals were refused due to the lack of an available staffed bed during the winter period of peak demand.
- 19 patients had their surgery postponed due to lack of a PICU bed.
- The development of the Paediatric Critical Care Network has continued with multidisciplinary audit and feedback sessions held in all Trusts.
- The UK Paediatric Intensive Care Audit Network Database (PICANet) has published its 6th report (www.picanet.org.uk).

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CHAPTER 1

THE LEAD CENTRE PAEDIATRIC INTENSIVE CARE TEAM

Dr Helen Fardy	Lead Clinician	Paediatric Critical Care Service
Mrs Paula Davies	Lead Nurse	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 Michelle Jardine	Consultant in Paediatric Intensive Care	
Dr Fieke Slee-Wijffels	Consultant in Paediatric Intensive Care	
Ms Alison Oliver	Regional Training & Development Co-Ordinator for Paediatric Critical Care Services in Wales	
Mrs Catherine Wood	Directorate Manager	Critical Care Services
Miss Kath Ronchetti	Senior Physiotherapist	
Mrs Julie Armstrong	Practice Educator	
Mrs Kath Singleton	Dietician	
Zoë Taylor	Pharmacist	
Mrs Pat Davies	Personal Assistant to Lead Clinician	
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.Davies4@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

The Paediatric Intensive Care Unit and Retrieval Service is covered by a team of 7 consultants. In combination, with designated general paediatricians, the team also contributes to the cover of the Paediatric High Dependency Unit.

Specialist Registrars

The paediatric intensive care unit has a dedicated middle grade rota of resident specialist registrars; four from the Welsh paediatric rotation and one from the Welsh anaesthetic rotation. We have experienced difficulty in recruiting both paediatric and anaesthetic registrars over the last twelve months; this most likely reflects a national shortage of registrars, with both specialities having unfilled posts on their rotations.

From 1st August 2009 the registrars' weekly hours have been reduced to 48. We have addressed this by introducing two new posts. We have appointed a nurse practitioner who is working alongside an SpR during the day, thus reducing the requirement for two registrars to work each day. She will eventually contribute to the out of hours rota and work at the level of a registrar. We have also introduced clinical fellow posts which are part-time research and part-time clinical and we hope that these will attract senior trainees and improve our junior doctor numbers.

We continue to do multi source feedback on all our registrars; and have received good comments from them regarding this. This is kept and will help form the basis of any references or annual review information that is required.

MEDICAL EDUCATION IN PICU, 2009

MALCOLM GAJRAJ

The training structure in medicine is changing, with more objective assessments, electronic portfolios and a more structured and streamlined training programme. This has impacted PICU in as much as the trainees require a greater level of formalised input, not only from consultant staff, but also from the nurses, who provide informal feedback every three months, but

who are now regularly invited to undertake multi-source feedback. This should result in an improvement in training, but there are few of us that have been formally trained in these processes. Nonetheless, a decision to alter the mentoring from one trainee per consultant per attachment has been acted upon for the start of 2010, as the lack of Educational Supervisors for Child Health means a greater onus on the Clinical Supervisors is inevitable. In the interim, we continue to provide a highly evaluated educational opportunity to those trainees whom we have.

We have also increased our role in the education of undergraduates. In addition to providing one of the introductory lectures and a continuation of a short PIC contribution to the block for UHW placed students, we now increasingly mentor individuals and groups in various SSC modules, including 1st, 4th and 5th year medical students. This is very well received, with some students asking to return to us where possible. We hope that by providing a positive experience, we can encourage tomorrow's doctors to pursue a career path in paediatrics, if not paediatric intensive care.

We are also trying to increase our role in the provision of simulator training, with collaborative efforts involving anaesthetists and paediatricians in South Wales. There are ambitious plans to provide undergraduates with a day of simulation during their child health blocks, but this is still in the planning phase, although a successful pilot has already taken place. Further improvements will take place once the lecturer posts have been filled, as the School of Anaesthesia will be looking to those individuals to increase the scope of current simulator training, both for undergraduates and postgraduates.

2009 was the year of the swine flu pandemic and that impacted upon us. We had to consider how to look after the vast number of predicted possible admissions. There were strategies put in place locally to increase our capacity, with education for staff who would be undertaking unusual duties in unfamiliar environments. We also had a duty to colleague's outwith the trust, who would be expected to manage critically ill children for prolonged periods of time. To that end, we created some guides and emphasised our website. Although the workload from swine flu did not materialise, this work has been useful in that it can be applied to other children and will help to improve the initial management of children before retrieval.

2010 will hopefully be an interesting year for education, with the lecturer posts filled and a change in supervision of the trainees. In addition, the new Medical Director at our Trust has stressed the importance of education and the support that will be granted by the organisation!

INHOUSE TEACHING AND TRAINING INITIATIVES

Resus scenarios

We have progressed with this over the last year. We still continue to use the SIM baby to run surprise scenarios on the wards, thus checking the response times of the relevant personnel. We have now started running regular

scenarios in the emergency unit as this is the front line where many critically unwell children first present.

There have been several new wards that have opened up over the last year and we have run scenarios in them to check that hospital staff are aware of how to find them. We have also checked ease of access to move intubated patients from the new wards to PICU. Lastly we have now started using the SIM baby regularly in the Junior doctors' Thursday afternoon teaching programme as they have said that it makes cases appear more lifelike and teaching more enjoyable.

Senior Clinical Project

Rhiannon Allen has carried out a supervised study module and was awarded a high A grade; we will collect more data and submit to a paediatric meeting. I enclose copies of her and Nicola Ball's abstracts.

Nursing Staff

Lead Nurse for PICU – Paula Davies

We have continued to work towards an integrated nursing team which will provide care for both Paediatric Intensive Care and Paediatric High Dependency patients, eventually based on a combined 15 bedded Paediatric Critical Care Unit which will be built in Phase 2 of the Children's Hospital for Wales. Nursing representatives from both units have been involved in the planning for the new unit, and it has been an exciting time for us, realising that the service will be relocated and based in a hospital focused on children in a few years time.

With regards to recruitment we are able to recruit junior nurses without difficulty but still have problems recruiting to senior nursing posts as a result of the specialist skills we require at this level. Therefore education is very much a priority in terms of developing the nursing workforce. We have appointed a Practice Educator, Julie Armstrong to work across PICU and PHDU this year. The Practice Educator works with both PICU and PHDU nurses, ensuring that we offer support and supervision in providing excellent quality nursing care and also to facilitate a joint critical care training strategy.

The Paediatric Intensive Care Course has been successfully provided in partnership with Birmingham City University for the second consecutive year. This has enabled 5 nurses to achieve a specialist award and for us to continue providing a service compliant with the Standards for Critically Ill Children in Wales. It has also helped us to develop close professional links with the PICU team in Birmingham.

The nursing team have experienced a busy year with patient activity. We have shared a busy winter with many colleagues at our regional hospitals. In

addition the team have been working on evidence based nursing protocols and safer patient initiatives.

Finally we are developing a pathway for Advanced Nurse Practice in order to retain senior members of the nursing team who wish to remain in a clinical role. A proposal has been submitted to the Senior Management team and the outcome awaited.

All of these developments will contribute to enhancing the quality of our care and assist us in the delivery of a seamless transition through critical care.

Pharmacy Report

Post holder – Ms Zoë Taylor

Clinical pharmacy role on PICU

A specialist clinical pharmacist visits PICU every day Monday to Friday. The 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
- Advise on parenteral nutrition

The pharmacist will also provide advice in the preparation of guidelines and protocols, help with drug related audits, review any medication incidents, promote safe prescribing 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

Post holder – Miss Kath Ronchetti (Paediatric Respiratory/PICU)

The specialist physiotherapy service to PICU has been led and delivered by Katherine Ronchetti with input from other specialist physiotherapists when indicated. This service runs from Monday to Friday 8am -4.30pm. Outside of these hours a respiratory only emergency duty service is provided. In the

evenings there is an on call service from 4.30 pm to 7pm and then from 10pm to 8.30am. There is an evening service for appropriate patients from 7pm to 10pm. On weekends a service is provided from 8.30am to 5pm with the evening and on call service being the same as above. This out of hours service is delivered by a generic team of adult and paediatric physiotherapists.

During the past year the non bronchoscopic broncho-alveolar lavage document has been completed and is now live on the PICU website. This document contains the now standardised and evidence based procedure complete with photos, in order to aid training of staff. A video of the procedure is also currently being developed to also go on the PICU website. The training of senior nursing staff is currently being undertaken with the majority of them now competent in the procedure for the weekend shifts. It was decided that in order to prioritise the nursing staff, the rotational medical staff are no longer included in the NBBAL training.

A physiotherapy study was run last November in paediatric respiratory assessment and treatment. There was a reasonable attendance of respiratory physiotherapists across South Wales who came in preparation for the possibility of children being treated in their ICUs.

During the past year I have been doing some benchmarking and have visited both Alder Hey and Great Ormond Street PICUs. This has ensured that my practice on the unit is in keeping with other PICU physiotherapists. This also helped in the completion of the NBBAL document. I also attended the annual Association of Chartered Physiotherapists in Respiratory Care conference. This ensured that I was aware of the latest evidence based practice in respiratory care both in paediatric and intensive care settings. It also gave me new and refreshing ideas for treatments and also service development ideas for the future, specifically the on call service to PICU.

Dietician's Report

Post holder – Mrs Kath Singleton

Nutrition and dietetic advice is provided 5 days a week with every child on the PICU and PHDU receiving a review. There is an on-call service available on Bank Holidays and weekends. An analytical software programme has been in operation for several years which has benefited the unit by streamlining the provision of enteral feeds, allowing 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 within the limitations of a PICU setting. On PHDU encouragement is given to work towards and achieve the child's usual feeding regimen or move onto a normal oral intake. The rolling educational programme continues which highlights the importance of nutrition. The dietitian continues to liaise with colleagues both within and outside the Trust to guarantee a seamless service.

CHAPTER 3

THE REGIONAL PAEDIATRIC CRITICAL CARE SERVICE

Regional Education and Training Report 2009 - Alison Oliver Regional Training and Development Nurse for PIC Services in Wales

This year has brought new challenges with the main one in the winter being the unpredictable nature of pandemic flu and how many children this would affect in South Wales. The preparation plans created some positive outcomes for the critically ill child service as there was more engagement this winter in the region than ever before with all hospitals requesting multidisciplinary teaching sessions in caring for critically ill children. In addition a formal training day for physiotherapists in the region was arranged by our physiotherapy lead which was delivered by the physiotherapy and PIC team.

Some equipment was also purchased in the region to deal with the potential increased numbers of paediatric patients. Coincidentally more children have been provided with non invasive ventilation this winter than in previous years preventing a number of them being admitted to the PICU. Thankfully the numbers with H1N1 estimated did not come to fruition; however, the winter was exceptionally busy without those cases.

Ongoing change in Health Service Provision in Wales continues. Reconfiguration of services brings both challenges and optimism for future developments. It also creates challenges for the maintenance of competence for staff groups who may well have reduced exposure to critically ill children. Regional visits and training days are still available for secondment if individuals at all levels wish to maintain competence in caring for critically ill children.

Simulation days have been developed and are offered to all hospitals from which our service retrieves. Two of these have happened again this year. They were well attended and will help the progress in hospitals meeting the recommendations of the "Tanner Report".

Feedback regarding retrieval and regional services at all trusts has been ongoing. Teaching sessions from your link consultant can be arranged by contacting the service through the internet site or the unit administration service through 0292074 ext 6423. Local multidisciplinary involvement in these feedback meetings is crucial in making them beneficial to all especially future patients.

The PIC network group (previously the paediatric intensive care advisory group) for critically ill children continues to meet for South Wales to progress and audit the work in care of the critically ill child. The care bundles for Head Injured and Septic children have been audited and awareness and compliance is improving. The respiratory bundle is now being launched and is available on the Cardiff PIC website along with the minutes of these meetings. Ongoing work continues regarding reviewing the newly devised standards for the network groups as part of the CYPSS project. The Paediatric

Intensive Care Society have also produced the draft standards for the critically ill child for consultation and the final version should be produced in 2010. Ongoing national reviews regarding the care for critically ill children with burns, cardiac care and neurosurgery continue.

The PHDU nurses' network forum has also been launched this year with attendance from nursing staff from all hospitals providing Paediatric High Dependency care. This group is in its infancy and will also have a link page on the network page of the PIC site which hosts network sites at this time.

EPALS is still available at Prince Charles Hospital, Merthyr Tydfil and West Wales General Hospital, Carmarthen.

APLS is also available at the Cardiff and Gwent sites

Foundation in Caring for the acutely ill child course ran in Cardiff University in 2009. Unfortunately the Swansea University course was cancelled this year. Recruitment to these courses is difficult as there are small numbers of staff requiring them and until reconfiguration is further advanced training needs for the future services are difficult to assess.

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

Course co-ordinator for Resuscitation Service – Aneurin Bevan LHB APLS/PLS	Joanne Powell Royal Gwent Hospital Newport Tel: 01633 234234
Course Co-ordinator for Resuscitation Service. Cardiff & Vale ULHB APLS/PLS	Jacqui Scott 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	Jane Davies Eastgate House Newport Road Cardiff Tel: 029 20927732
Child Health Education	Jo John 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	Full Study Days
Morrison Hospital	15 Oct 2009	21 August 2009
Singleton	19 th Mar 2009	21 st September 2009
Royal Glamorgan Hospital	30 Apr 2009	21 st April 2009 16 th October 2009
Princess of Wales Hospital	12 Oct 2009	14 th October 2009 9 th November 2009
West Wales General Hospital	24 Nov 2009	22 nd July 2009 29 th July 2009
Withybush General Hospital	Via tele-conferencing 24 Nov 2009	6 th Nov 2009
Prince Phillip Hospital		
Neath/Port Talbot Hospital		
Prince Charles Hospital	30 Nov 2009	28 th May 2009 12 th November 2009 30 th November 2009
Nevill Hall Hospital	12 May 2009	14 th August 2009 5 th November 2009
Bronglais Hospital	Via tele-conferencing 24 Nov 2009	22 May 2009
Royal Gwent Hospital	8 May 2009	13 th February 2009 4 th September 2009 28 th September 2009 8 th October 2009 22 nd October 2009
Glan Clwyd Hospital	N/A	
Ysbyty Gwynedd Hospital	N/A	
Wrexham Maelor Hospital	N/A	

The Lead Centre PICU provided :

Physiotherapy Study Day- 25th November 2009

Study day set for simulation provision (mixed) – West Wales General Hospital - 27th January 2009

Simulation day provided - Nevill Hall on 16th June 2009

325 staff attended sessions this winter from all NHS Trusts in the South Wales Region

North Wales – No formal education was provided this year. The internal commitments that have prevented the networking with North Wales will end this year and it is hoped that more education, along with their local lead centre will be provided next year.

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 FROM APRIL 07
Singleton Hospital	Ingo Scholler	Malcolm Gajraj
Morrison Hospital	Rachel Evans/ Wynne Rogers	Malcolm Gajraj
Royal Glamorgan Hospital	Lynne Millar-Jones	Allan Wardhaugh
Prince Charles Hospital	David Deekollu	Allan Wardhaugh
Princess of Wales Hospital	Nirupa d'Souza	Malcolm Gajraj
Bronglais Hospital	John Williams	Mark Price
West Wales Hospital	Vinay Saxena	Mark Price
Withybush Hospital	Gustav Vas Falcao	Mark Price
Prince Phillip Hospital	via West Wales	Mark Price
Neath/Port Talbot Hospital	via Singleton	Malcolm Gajraj
Nevill Hall Hospital	Marcus Pierrepoint	Michelle Jardine
Royal Gwent Hospital	Marion Schmidt	Michelle Jardine

Drs Rim Al-Samsam, Damian Pryor and Fieke Slee-Wijffels work with Alison Oliver running of the 'Stabilisation Study Day'. We have been fortunate as a service to receive significant amounts of money due to the generosity of the families and friends of our patients. We have therefore purchased a simulator which aids enormously with our training days and inhouse scenarios.

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

We, in line with paediatric colleagues across Wales await further developments with the CYPSS. Our aim is for the "informal" network we have set up over the past 6 years from the lead centre, to be developed 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 met on the 30th April 2009 and 24th September 2009.

The table below outlines representation of the group :

Helen Fardy	Lead Clinician	PICU
Paula Davies	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 activity

The mainstay of our data are derived from reports generated by PICANET and further information can be accessed at www.cardiffpicu.com.

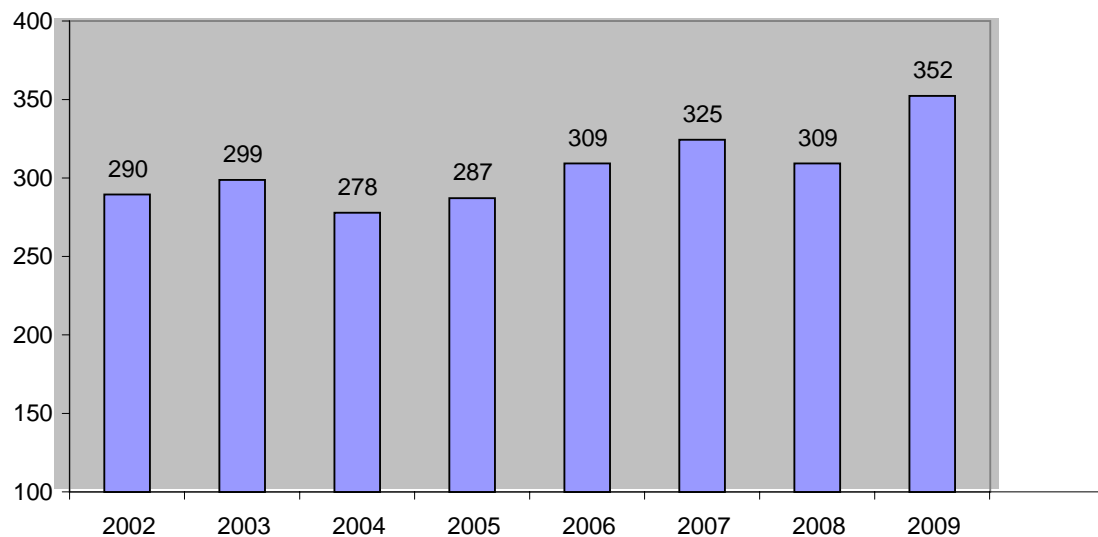
The following data represent some of the highlights and serve to provide an outline of our service over the year.

Admissions

Total

This was our busiest ever year, with 352 admissions. Of those, 88% received invasive ventilatory support, with a further 2% supported with non-invasive support, either BiPAP or CPAP. The majority of patients not receiving ventilatory support were patients electively admitted following surgery. This compares favourably with many other units in the PICANET report, which due to non-availability of a separate HDU facility, inevitably admit many level 1 patients.

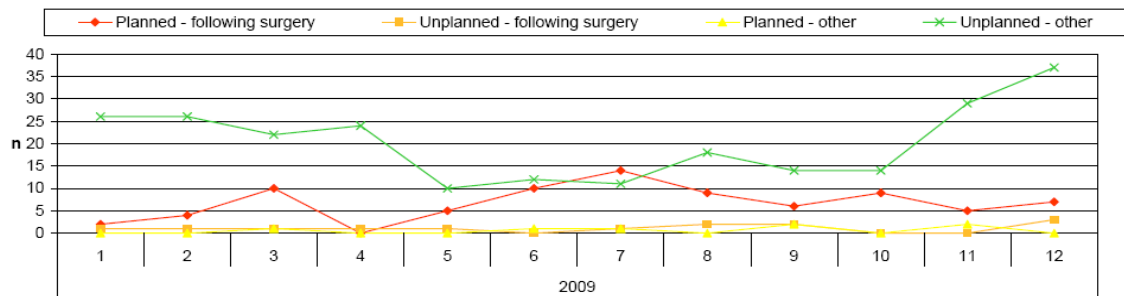
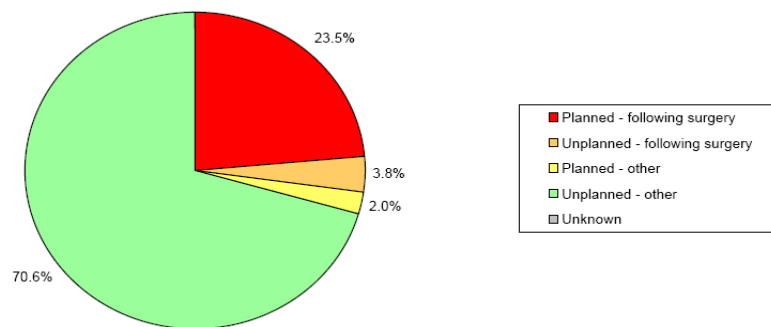
PICU admission trend



Unplanned vs Elective

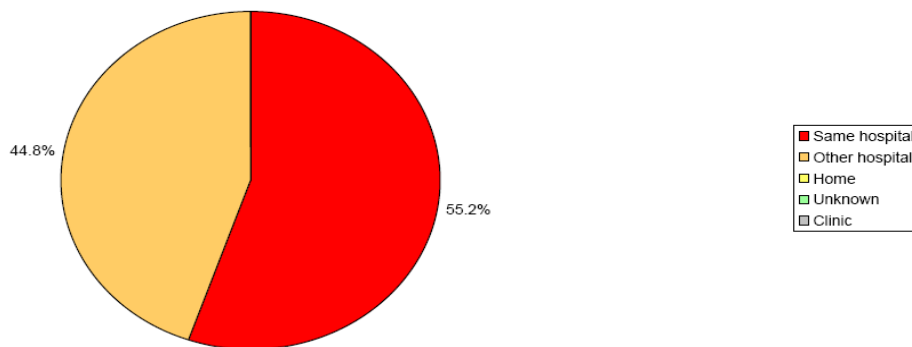
70% of our admissions were unplanned, non-surgical patients. 80% of the remainder were elective surgical patients. There were a small number of unexpected surgical patients, i.e. patients unexpectedly unwell after surgery or, more commonly, patients requiring intensive care following an emergency surgical procedure. The small number of elective non-surgical patients comprised patients transferred back to Wales for other UK PICUs where specialist treatment (including cardiac surgery) had taken place, but where the requirement for intensive care was ongoing.

Elective vs Emergency 2009



Source of admission

55% of admissions were from within UHW. However, this figure hides the true picture of admission source, in that many patients are resident in other parts of Wales, but who are in UHW at the time of PICU requirement. This is true not only for elective surgical patients, but also for patients receiving other specialist treatment who become acutely unwell.



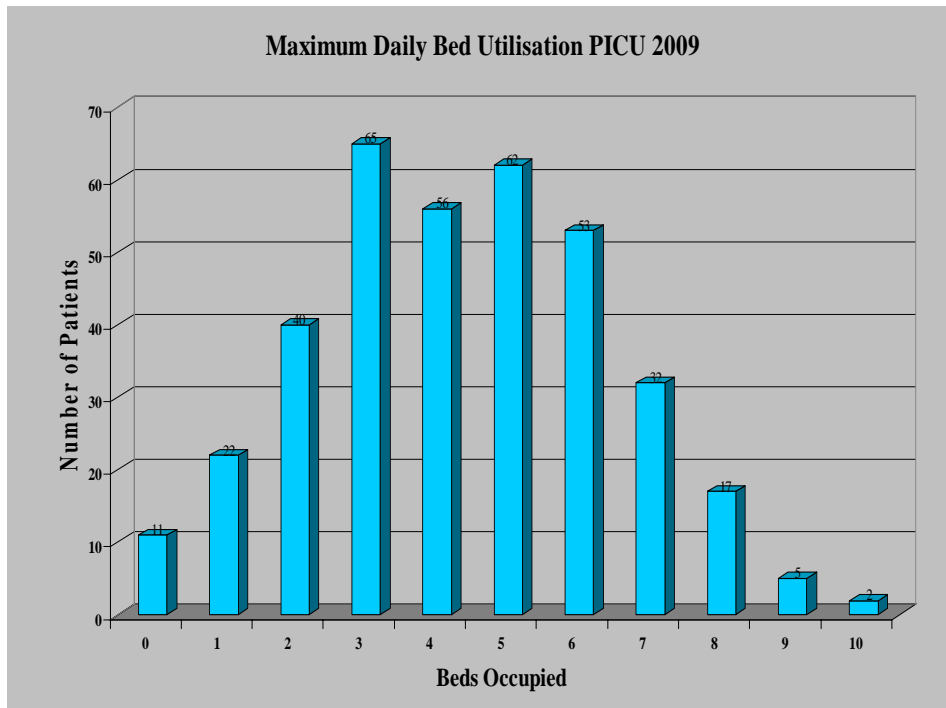
Diagnostic Group

The pattern is as previously, with approximately a third having a primary respiratory diagnosis precipitating admission. Infection and neuropathology (principally seizures) are equally represented and make up a further third. Of the elective patients, the majority have had scoliosis surgery, hence musculoskeletal admissions comprise 17% of the total.

Further analysis of the data is difficult, due to the different coding practices of clinicians. An example is meningococcal sepsis with shock, that can be classified primarily as shock or septic shock (CVS) or sepsis or meningococcal sepsis (infection). RSV positive bronchiolitis may be categorised fully, partially as bronchiolitis or even less specifically as LRTI or pneumonia. This is of relatively little consequence within the unit, but needs to be considered when comparisons are made to other units.

Bed Occupancy

More important is how the beds are used. Occupancy is a crude measure, reflecting an average number of occupied beds each month. However, there are wide variations, as our service is predominantly emergency based, with length of stay very much shorter for the elective patients compared with infants with respiratory disease. We are commissioned to cater for 95% of demand and in so doing have an apparently inefficient service, with under-occupancy. The reality is that the wide variation means that on occasion, especially in the winter, our demand exceeds the seven commissioned beds and we can only accommodate those patients by being flexible; this can only occur as we offset the busy periods against those with fewer patients.



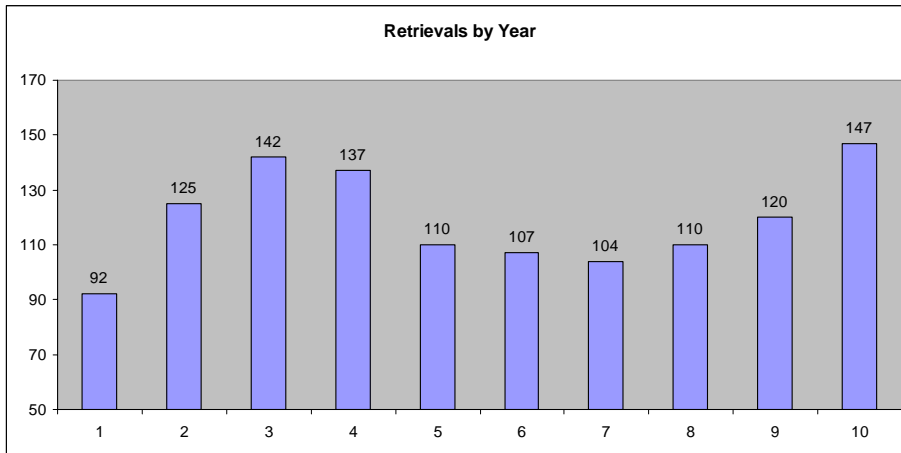
CHAPTER 5

THE RETRIEVAL SERVICE

Retrieval Activity

The increased retrieval activity reflects the general increased patient numbers. In addition 3 patients were refused retrieval by us, due to capacity issues. This was managed well throughout the region, possibly helped by some of the preparation for the unrealised pandemic flu surge in PICU requirement. Furthermore, the pattern of retrievals over the year demonstrates the seasonality of work and to some extent shows a more exaggerated pattern, as the unit seasonality is offset to some extent by elective surgical work.

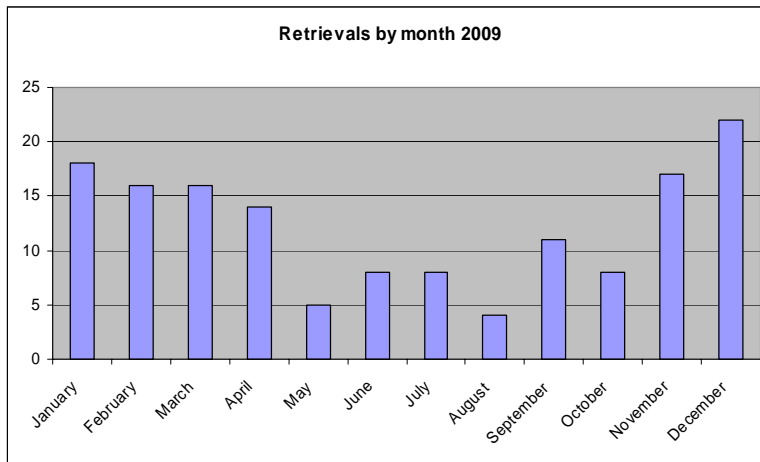
Retrievals by year



The decline in retrieval activity from 2004 reflects the closure of the inpatient facility in Llandough. Thereafter there is relative stability, although the increased activity in 2009 mirrors our overall activity for the year and the proportion of retrieved patients is similar to previous years.

Our activity levels over the year are also mirrored by retrieval activity over the year, with most retrievals occurring in the winter and spring months and are characterised by predominantly infants with respiratory failure. Of note, there was little swine (H1N1) flu related activity, consistent with evidence nationally that although large numbers of children were infected and in hospital, very few became critically ill.

Retrievals by month 2009



CHAPTER 6

CLINICAL GOVERNANCE/AUDIT/RESEARCH

Medical Student Work

"Does Early Goal-Directed Fluid Resuscitation of
Paediatric Shock Give Better Outcome on PICU?"
A Small Welsh Cohort Study

Rhiannon Allen
5th Year medical student

Summary

Background: Shock contributes to a large proportion of PICU admissions. Early goal-directed therapy has been shown to improve overall outcome in these patients. This study aims to assess whether appropriate fluid resuscitation at first presentation of shock reduces length and severity of PICU admission.

Method: 21 children presenting with septic and hypovolaemic shock were included in this primarily retrospective observational cohort study. Subjects receiving 60ml/kg of fluid bolus within the first 2 hours were assigned to the "well resuscitated" group, with the remainder assigned to the "poorly resuscitated" group. Outcome on PICU was compared across groups.

Results: 14 children were deemed „well resuscitated" and received more fluid prior to PICU, but less fluid whilst on the unit than compared to the 7 children deemed "poorly resuscitated". Total fluid requirement was however similar. Well resuscitated children saw a trend for faster lactate normalisation and lower overall lactate levels, reduced total inotrope and ventilation days and shorter duration of PICU admission. In addition, well resuscitated children were referred to PICU significantly earlier than poorly resuscitated patients.

Conclusions: Prompt fluid resuscitation of septic and hypovolaemic shock gives better overall outcome on PICU. Poor resuscitation may be attributed to delay in recognition of the critically ill child.

A retrospective review of admissions to PICU with meningococcal septicaemia over a six month period in 2008 compared to the same period in 2004.

Abstract

Introduction: Meningococcal septicaemia is due to bacterial infection of the blood with *Neisseria meningitidis*. It is a significant problem in the paediatric population and is the commonest infective cause of death in children and young people up to 20 years of age. Prompt recognition and early treatment have been shown to improve patient outcome.

Aim: The aim of this study was to compare two groups of children looking at: the incidence of meningococcal septicaemia and mortality and morbidity rates.

Method: This was a retrospective review of admissions. All children admitted between January 1st 2004 through to June 30th 2004, and the same period in 2008; with the diagnosis of meningococcal septicaemia were included in the review. Data was obtained from the PICU discharge summaries.

Results: The incidence of meningococcal septicaemia admissions to PICU was 7.79% in 2008, compared with 4.26% in 2004. The majority of children (n=14) presented at less than 5 years of age. Children admitted in 2004 had a higher average PIM2 score and spent longer on PICU than those admitted in 2008. Mortality rate was 8.33% in 2008 compared with 0% in 2004.

Discussion: Published data does not support this increase in incidence of meningococcal septicaemia that we have seen, and in fact HPA statistics show a decrease in the incidence of meningococcal disease over this time period.

Conclusion: This review has shown that whilst the incidence of meningococcal septicaemia admissions to PICU appears to have increased, there is no evidence that severity of disease has also increased. No increase in morbidity was seen between the two groups either. Mortality rate did increase, but this is most likely a consequence of the relatively small sample size and time period the project covered, and it is not thought to be a true reflection of an increase in mortality from meningococcal septicaemia.

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.