

PIER 2018 CONFERENCE

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Critical Care Study Days Level two

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Aim

To provide appropriate knowledge, skills and education for nurses who care for inpatient children requiring High Dependency Care in District General Hospitals.

Background

There is a national recognition hospitals admitting children should be able to deliver Level 1 paediatric critical care (PCC), a limited number of hospitals should be able to deliver Level 2 PCC in a critical care area. At the centre of the recommendations is the child and his family with the goal to provide them with the best care as close to their home as possible (RCPCH 2014)

Studies by Day et al (2005), Monaghan (2005) and Tume (2007) all identified that the knowledge, education and skills required to care for these children in DGH's are poor. They also highlighted that many emergency admissions to PICU could be avoided or not required if deteriorating children were recognised, escalated and communicated with PICU professional sooner.

Method

Wessex region established a programme to address these issues by establishing two pilot study days. These were designed and arranged using the framework 'Time to Move on Document' (RCPCH 2014) for the education delivered and using the skills passport to consolidate learning.

Results

The initial pilot consisted of two days with twenty four band 6 and band 7 nurse from DGH's across the region. Both days were well received and the feedback collected reflected this. On average respondents gave scores of 7.4/10 when asked whether the education content had been pitched at a receptive level. Scores for the days overall and whether the education programme should be rolled out across the region averaged 9/10.

Conclusions

The pilot days identified that nurses in DGH's also recognise the needs of the child and his family and that they require an element of critical care nursing outside the PICU environment. Nurses were very receptive to the education and knowledge related to the observation, monitoring and intervention required to achieve this within their own work environment. The Critical Care study days are now being rolled out across the Wessex region and Thames valley. The effectiveness and change this makes to children in DGH's will continue to be evaluated.

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Avoiding Term Admissions into Neonatal Units (ATAIN)

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Background/Aims

Term live births are declining but these babies are requiring more neonatal care days than ever before. Term babies without congenital anomalies should not require neonatal input and if they do it is a proxy indicator that along the midwifery, obstetric or neonatal pathway avoidable harm may have been caused. Separation can have a profound effect on the physical and mental health of mother and baby, and avoiding term admissions has become a national patient safety focus.

In 2017 Southampton Neonatal Unit (NNU) admitted 351 term babies. Equating to 6.7% of term live births this was higher than previous years and comparable tertiary units. We aimed to establish why babies were admitted in order to provide focused multidisciplinary education, improve neonatal care, reduce harm and avoid separation.

Methods/Approach

All admissions were reviewed in detail and assigned an ATAIN diagnosis. Analysis revealed a 33% rise in unexpected admissions direct from birth compared to 2016. 34% were discharged within 24 hours and 20% did not receive an intervention exclusive to the NNU. Most had respiratory disease or poor perinatal adaptation.

Our focus became: 'supporting the transition to postnatal life - keeping mum and baby together'. Interventions included:

- Junior doctor training - supporting the transition
- Labour/post-natal ward reviews
- Simulation scenarios
- Senior review & nurse in charge agreement prior to admission
- Spires Cleft lip/palate training
- Audio-visual slides
- Theme of the Week
- One Minute Wonder
- Obstetric/midwifery case reviews
- Wessex-Oxford Neonatal Education Programme
- ATAIN e-learning package
- Consultant ATAIN leads
- 'Red Hats'

Results/Measurements

In the first six months of 2018 we safely reduced term admissions by 18% and are now within national targets. Unexpected admissions direct from birth fell 26% with no adverse events. Poor perinatal adaptation and respiratory diagnoses fell by 38% and 26% respectively. Staff feel more confident to support the transition to postnatal life.

Conclusions/Outcomes

Presenting at multidisciplinary local/network levels has enabled us to share good practice. In the future our '4-Hour Focus to Discharge' pathway, multidisciplinary simulations and cleft lip/palate pathway will hopefully keep even more mothers and babies together.

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Effects of consultant residence out-of-hours on acute paediatric admissions

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Background

Acute paediatric units require round-the-clock skilled resident medical cover, but the numbers of level 2 and 3 trainee doctors able to provide this are insufficient. Increasingly, fully-trained doctors are being used to provide this by remaining resident on-site at night and during weekend days. Although early consultant review is likely to enhance the quality of care received by children being assessed at these times, the costs to providers are higher than when trainees provide the cover. In compensation, more senior doctors may be less likely to admit children. Salisbury District Hospital provides a 24-hour, 7-day acute paediatric and neonatal service. From 2007, the out-of-hours resident cover has been divided between level 2/3 trainees and consultants, providing an opportunity for a quasi-randomised trial.

Method

From duty rotas between 2007 and 2017, each night (Monday-Sunday 21.00 to 09.00) and weekend day (Saturday and Sunday 0900-2100) shift was identified as resident consultant or non-resident consultant. Hospital activity databases were interrogated to establish numbers of admissions (stay > 4 hours) under medical paediatrics. Sub-groups who stayed > or < 12 hours were identified.

Results

There were 2,549 consultant resident nights and 1,233 nights when no consultant was resident; 483 weekend days when consultants were

resident and 586 when not. Of the 4,233 children admitted during 3,782 night shifts, the mean admission rate for resident consultant nights was 1.64 and for non-consultant nights 1.57 [IRR 1.12; p <0.007]. For weekend days, for the 1,511 children admitted, the mean admission rates per day were 2.12 for resident consultant shifts, and 2.13 for non-consultant shifts [no significant difference]. Those that stayed more than 12 hours, the mean admission rate per shift (day and night) was 1.83 for consultant shifts and 1.89 for non-consultant shifts [NSD].

Conclusions

A resident consultant presence was not associated with reduced admission rates. A higher admission rate on consultant nights was not seen when less ill children who stayed <12 hours were excluded. Any clinical or economic benefits from resident consultant presence out-of-hours are not reflected in admission numbers.

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Using handheld 3D scanning as a technique for measuring neonatal head circumference and length

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Background

Measurement of length and head circumference (HC) in addition to weight is vital in assessing the nutritional status of preterm infants. Current anthropometry represents an interruption to preterm infants and may not be possible in unstable infants. Hand-held 3D scanning has the potential to perform bedside anthropometry (length and HC) in a less invasive manner. We aimed to evaluate the feasibility and performance of 3D scanning as a 'non-touch' measuring technique for routine anthropometry.

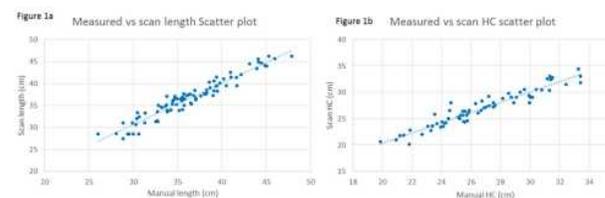
Method

Preterm infants born before 30 weeks gestation were recruited from a single neonatal unit. HC and length were measured both manually and by a handheld 3D scanner at recruitment and weekly until discharge. The two

methods were compared using the Bland-Altman method and linear regression. This study received ethics approval from an NHS Research Ethics Committee (Oxford A, ref 14/SC/1275).

Results

17 infants had scan images taken over a 4-month period (87 separate length and 67 HC scan measures with manually taken reference measures). The mean (95%CI) difference between manual and scanner HC measurements was 0.18cm (-0.06 to 0.42cm), the mean percentage difference with all values expressed as positive was 3.16% (2.33% to 4.00%). The mean difference for length measures was 0.27cm (0.03 to 0.54cm) the mean for length percentage difference with all values expressed as positive was 3.24% (2.69 to 3.79%). Bland-Altman plots showed reasonable agreement between the two methods. Linear regression demonstrated a high correlation between scanner and manual measurements of HC ($r=0.96$, figure 1a) and length ($r=0.96$, figure 1b)



Conclusions

These data show a high correlation between measurements gathered from 3D scan images and standard anthropometry. This suggests that 3D scanning could represent a feasible, accurate and practical way of monitoring the growth of preterm infants with minimal handling and without interruption to developmental care

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Improving the Stabilisation of Premature Babies at Delivery - Encouraging Routine Use of Non-Invasive Respiratory Support

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Background

Evidence is increasing that even extremely premature babies can be managed with non-invasive respiratory support (eg CPAP) at delivery instead of routine intubation based on gestation. This avoids complications from mechanical ventilation and improves long-term respiratory outcomes. Clinical practice in our unit was noted to be variable and we were an outlier for delivery room CPAP in the 2016 VON (Vermont-Oxford Network). Our QI project aims to improve the stabilisation of premature infants (<35/40) at delivery, by providing respiratory support along a standardised pathway based on individualised assessment (instead of gestational age stratification), reserving invasive ventilation solely for babies who require it.

Method

Change ideas were incorporated into 3 PDSA Cycles over 6 months:

1. Simulation to practice implementation of the standardised respiratory management pathway.
2. Simulation to test and practice the pathway with the new equipment in-situ.
3. Implementation in practice with respiratory management flowchart memoires on all resucitaires.

Qualitative feedback from simulation debriefs alongside retrospective medical note analysis of respiratory management at delivery for all babies born <35/40 gestation on a rolling monthly basis during the 6 month period was collected and analysed against balancing factors including incidence of pneumothoraces and admission temperatures.

Results

The 6 month data did not show a sustained improvement in the use of non-invasive respiratory support (Fig 1 attached). However the numbers were small and we observed better documentation of decision-making, indicating clinicians were becoming more selective about intubation at delivery. Initial improvement work had also commenced prior to the data collection period, so some improvement may have already occurred - as shown by the national VON data. However simulations in situ did identify important equipment challenges resulting in provision of longer tubing to enable CPAP delivery in confined environments. Positively, the balancing measures were unaffected by the changes we implemented.

Conclusions

A possibility for the lack of change seen in the 6 month data is that the simulation cycles didn't involve neonatal consultants who tended to lead the more extreme preterm stabilisations. Educational videos may be more successful in this group and will form the basis of our 4th PDSA cycle.

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Recognition and Assessment of the Paediatric Patient in Deterioration (RAPPID): A simulation-based multi-professional course

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Background

Simulation is widely acknowledged as an effective method of education in healthcare; allowing participants to immerse themselves in scenarios that are infrequent yet high stakes in nature. As healthcare professionals we attend life support courses regularly however simulation is used as a means of assessment with minimal debriefing time and yet we know this is the part of simulation where the majority of the learning happens. Simulation provides the opportunity to explore the human factors that impact the way we work and the subsequent impact on patient care. In response to this and to support our in-situ simulation programme within Southampton Children's Hospital this course was developed.

Method

This one day multi-professional simulation based course, RAPPID, was piloted in February 2018. The faculty included Paediatric nurses with a background working in Paediatric High Dependency Unit (PHDU) or Paediatric Intensive Care Unit (PICU) and Paediatric consultants, all with simulation faculty experience. 12 candidates took part in 5 simulations. Evaluations which comprised of a likert scale to rate four specific questions about each simulation and free text space were provided and time to complete these allowed. Faculty feedback was invited via email.

Results

The pilot generated very positive feedback and from this and faculty observations throughout the day, changes will be implemented to the programme. The faculty has been streamlined to make the course sustainable. Paediatric medical trainees have been asked to facilitate on future courses and fewer nurses will be required. We will introduce some

minor changes to increase the fidelity of the scenarios such as asking the participants to wear uniform and including an older child scenario.

Conclusions

By training paediatric healthcare professionals to use a structured approach to assessment, improving their knowledge and giving them a framework to escalate effectively we believe this course will give them the confidence to care for acutely ill children and most importantly improve patient safety and outcomes. We plan to run this day twice more in 2018 and five times each year thereafter reviewing the evaluations after each course and making amendments as required.

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Failure To Thrive...Getting To The Heart Of The Problem

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Background

Failure to thrive is a common problem seen in paediatrics with a number of possible causes. It is defined by NICE as weight below 2nd centile, a fall across 1 centile if birthweight <9th centile, a fall across 2 centiles if birthweight 9-91st centile or a fall across 3 centiles if birthweight >91st centile.

Method

Two case studies of failure to thrive secondary to cardiac pathology.

Cases

The first is a 10 week old girl referred by GP with 80g weight gain in 4 weeks, recurrent viral illnesses and one day history of poor feeding. Observations were normal, bloods were unremarkable and urine dip was negative. She was NG fed overnight, feeding gradually improved and was discharged only to return a week later. Weight had dropped from 50th to 9th centile and baby was only taking 75ml/kg/day of feeds. Examination revealed a 2/6 systolic murmur, mild subcostal recession and palpable femoral pulses. CXR showed significant cardiomegaly. Echocardiogram showed a massively dilated left ventricle, significant mitral regurgitation and appearances suspicious for ALCAPA. ECG showed ischaemic changes. The patient was transferred to tertiary centre where ALCAPA was confirmed. The second case is a girl who first presented with poor feeding and failure to thrive at 11 weeks of age. Weight dropped from 50-75th centile to <0.4th centile. Examination was unremarkable and bloods

were normal. She was treated for reflux and trialled partially hydrolysed formula but continued to struggle with feeding and weight gain. Extended metabolic screen was sent and sweat test planned. Chest x-ray showed cardiomegaly and ECG showed signs of right ventricular hypertrophy and left ventricular strain. Echocardiogram revealed massive enlargement of the left ventricle, mitral regurgitation and suspicious aortic arch. Femoral pulses were difficult to feel and there was a significant difference in blood pressure between upper and lower limbs. She was transferred to tertiary centre where coarctation of the aorta was confirmed.

Lessons for Practice

Whilst not a common cause of failure to thrive it is important to consider cardiac pathology in those not responding as expected to intervention. Simple investigations such as 4 limb BPs, ECG and CXR can be done easily and potentially lead to early diagnosis and intervention.

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The aetiology yield in Permanent Childhood Hearing Impairment (PCHI) from implementing the BAAP guidelines

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Background

Permanent Childhood Hearing Impairment (PCHI) can be detected at any point during a child's life, whether that is during routine screening or because of concerns at home or at school. The British Association of Audiovestibular Physicians provides guidance on aetiological investigation of children with permanent hearing impairment. The aim of this audit was to measure the outcomes of structured aetiological investigation of PCHI in line with these recommendations.

Method

We retrospectively applied standards set by the British Association of Audiovestibular Physicians on the aetiological investigation of children with permanent hearing impairment and carried out a retrospective review of children diagnosed in the Hampshire Hospitals NHS Foundation Trust in a 2 year period from July 2016 to July 2018.

Results

There were 31 children diagnosed in the study period. In 20 (65%) the aetiology was unknown, with 9 of those thought to have some genetic component. Congenital CMV infection accounted for PCHI in 2 patients (6%). Mutations in the connexin gene were found in 3 patients (10%). The remaining causes included structural abnormalities, such as enlarged vestibular aqueduct, vestibulocochlear nerve hypoplasia, birth asphyxia and unknown acquired infections.

Conclusions

Despite the range of investigations available today the majority of patients with PCHI still have an unknown cause. However, we are detecting more genetic causes, which provide valuable information for families in terms of genetic counselling and for clinicians in guiding follow-up and referral. As knowledge of conditions linked to PCHI and testing improve we hope more families will gain the answer to the question "why is my child deaf", providing not only a diagnosis but also a framework for guiding ongoing investigation and management.

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Improving Storage and Distribution within Emergency Trolleys

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Background

A crash trolley is a set of drawers and shelves on wheels used in hospitals for transportation and dispensing of emergency medication and equipment.

Being able to pick the right tools and medication quickly during an emergency situation is of critical importance. Organisation, distribution and packaging of the equipment within the crash trolleys are risk factors, and their lack of maintenance may contribute to errors and consequential accidental patient harms. Selection errors can occur due to the lack of organisation in the drawers, or ambiguous packaging of equipment of different sizes.

Aim

The principal aim of this project is to minimise the time of finding the right equipment in the Crash trolley's by introducing a better organised system. This translates to a more successful management of cardiopulmonary emergencies by the clinical team.

Method

Firstly, risk factors are identified associated with the organisation, storage and distribution of the crash trolleys that could lead to potential errors when the trolleys are used. Photographs of other hospital's Emergency trolleys' were taken to compare the layouts and identify good or bad practices.

To improve visibility and accessibility of equipment, some different sized or shaped cutlery trays and plastic boxes were purchased and inserted

into each drawer, depending on the significance of the contents, size and package.

A trial has started with two newly equipped crash trolleys. Picking up the right sized suction catheters from the drawers posed a challenge. The suction catheter's manufacturer was contacted to inquire, whether it would be possible to forward to colour coded packaging in the future. An online survey was also created to collect feedback.

Outcome

Positive feedback received from staff. The remaining crash trolleys were also set up with the new layout. Awaiting response from the manufacturer of the suction catheters.

Future Plans

Plans include emulating an emergency situation using one of the newly equipped crash trolleys in order to provide a quantitative measure for the improvement.

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Reducing the need for General Anaesthetic through MR Play

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Background

MRI under general anaesthetic (GA-MRI) is a resource intensive process with the cost to NHS trusts far exceeding the tariff they receive. Play therapy can be used to equip the child with the skills needed to understand and cope with the procedure, without the need for GA. Successful use of MR Play can result in an approximate saving of £967 per 60 min scan.

At University Hospital Southampton (UHS) we carry out around 500 MRI scans on 4-8 year olds each year. On average, 50% of those were carried out under GA.

Method

In May 2017 a pilot project was launched at UHS in partnership with the Paediatric Neurosciences ODN to test the theory that 25% of children aged 4- 8years undergoing a GA-MRI could be converted to MRI awake with the support of play therapy.

The number of MRI scans carried out under GA and awake was monitored throughout, and continues to be collected looking for changes in trends. The project soon expanded to include children as young as 3 years and older than 8 years.

Results

117 children were referred to MR Play in the first 15 months to end of July 2018 (target age-group n=92), with an overall success rate of 96%. A

saving of £59,951 has been achieved compared to those patients having a GA-MRI. So far we have seen a 5% decrease in the percentage of patients undergoing a GA- MRI in the target age-group, with on average 44% now having a GA-MRI. May - July 2018 has seen this reduction increase to 10% (33% GA-MRI).

Conclusions

Play therapy is effective in supporting children as young as 3 years through MRI without GA. The success of the project has put pressure on the play therapy workforce as the team to date have included this added workload into their existing work programme. We are now looking to progress the project to employ a dedicated play therapist for radiology in order to meet the co-designed regional best-practice pathway where all children aged 3 years and over go through the play therapy team as a first line.

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Growth patterns and growth failure in preterm infants: what to accept and what to expect

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Background

Previously published data have demonstrated that preterm infants experience a fall across marked centile lines for weight in early life with early poor head growth also reported. This study describes a single neonatal unit's experience of longitudinal change in weight, head circumference (HC) and length from a cohort of preterm infants born <32 weeks' gestation.

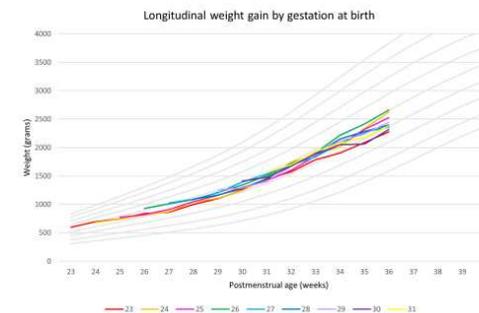
Method

Data were collected from a single neonatal unit between July 2012 and June 2017. This period followed the introduction of improved nutritional

guidelines. Patients were grouped according to their gestational age at birth. Growth lines were constructed for weight, HC and length in each gestational age group from the median measures and compared to reference centile lines.

Results

Data were analysed from 396 patients' consisting of 2808, 1991 and 2004 measures for weight, HC and length respectively. Longitudinal growth plots did not show an initial absolute weight loss in any of the subgroups. Across all groups the mean fall in SDS between birth and 36 weeks was -0.27 (95% confidence interval -0.39 to -0.15).



Conclusions

This description of longitudinal growth in a cohort of preterm infants demonstrates that early postnatal growth failure is not inevitable, with most infants growing along a trajectory close to their birth centile. There is no evidence of a 2 marked centile line weight decrease or weight loss. These data provide evidence to suggest that extrauterine weight gain tracking centile lines can be achieved.

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The experience of nurses new to the Paediatric Intensive Care environment

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Background

Working in a PICU for the first time can be a daunting and overwhelming experience as a nurse whether they are experienced or newly qualified. There is a paucity of literature surrounding the needs of new nurses to the PICU environment and although it is possible to draw some inferences from general paediatric wards and adult ICUs, it was essential that the educational and support needs of new starters to PICUs are recognised through research to improve staff satisfaction, retention and identify the educational needs within this early period in a PICU career. The aim of the research is to explore the experience of new staff to PICU during their first 18 months in post.

Method

A qualitative, narrative methodology was essential to elicit rich data. Semi-structured interviews were conducted within the first two weeks of starting on PICU, at 3 months and 12 months. Focus groups were conducted at 6 months and 18 months. Narrative analysis was performed independently, then collaboratively to generate themes.

Results

11 participants; six newly qualified and five with previous general paediatric experience were recruited to the study. The interviews were transcribed, coded and themed. The final themes of support, education and confidence will be presented in the poster at conference. Interviews

and focus groups focused on gaining information about stress, education and need for support.

Conclusions

New starter nurses, regardless of experience need support, particularly during the transition from student to newly qualified nurse. During their first 18 months the new starters demonstrated an increase in confidence and development of resilience. A support network for PICU staff has been initiated following this study to develop peer support, resilience and coping strategies. This study highlights that there is a clear need for greater support for new staff and further research to explore this on a wider scale.

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A regional audit of orchidopexy surgery for undescended testis within a paediatric surgery network

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Background

Orchidopexy for undescended testis (UDT) is one of the most common paediatric surgery operations, with around 6,000 performed annually in the UK. This audit aim was to evaluate current management of UDT in the Wessex region across secondary and tertiary care.

Method

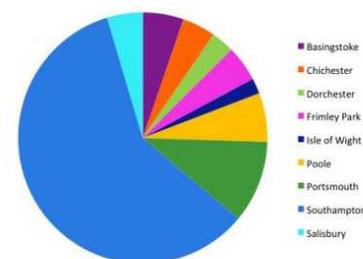
A retrospective multi-centre audit of all paediatric patients (<16 years) who underwent an orchidopexy in the Wessex region in 2016. was performed across the Wessex region. Practice was audited against standards based upon UK and European guidelines, specifically age at referral, imaging prior to referral and timing of surgery.

Results

302 orchidopexy procedures were recorded from nine centres (Figure 1). 179 procedures (59%) were performed at the tertiary paediatric surgery centre, and 123 (41%) at peripheral sites. Median age at referral for UDT was 31 months, (range 0-186) with 45 patients (19%) referred before the recommended age of 6 months. Despite recommendations to the

contrary, 56 patients (19%) underwent ultrasound scanning to look for the testis prior to referral. 89% of patients referred before 6 months were reviewed by a specialist before 8 months and 71% were operated on by 18 months of age Median age at the time of surgery was 41 months (range 4-202). Overall 25% patients had an orchidopexy before the recommended age of 18 months. All patients operated upon at peripheral sites were daycase procedures with no unplanned overnight admissions. 27 patients underwent surgery for a palpable UDT at the paediatric surgery tertiary centre that could have been operated upon at a hospital closer to home.

Figure 1: Orchidopexies at participating audit sites in Wessex



Conclusions

Following appropriate referral pathways, the regional network facilitates effective provision of orchidopexy surgery. Late referral from primary care prevents the provision of surgery at the recommended age (12-18 months). Ultrasound scanning, performed in a fifth of cases, is an unnecessary utilisation of resources. Regional network guidelines have been written and primary care providers contacted to highlight these findings with a plan to re-audit the effectiveness of these.

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George Frederic Still

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Background

2018 is the 150th anniversary of the birth of Sir George Frederic Still. He died in 1943 in Salisbury. Still is one of several contenders to the title of 'Father of British Paediatrics'.

Method

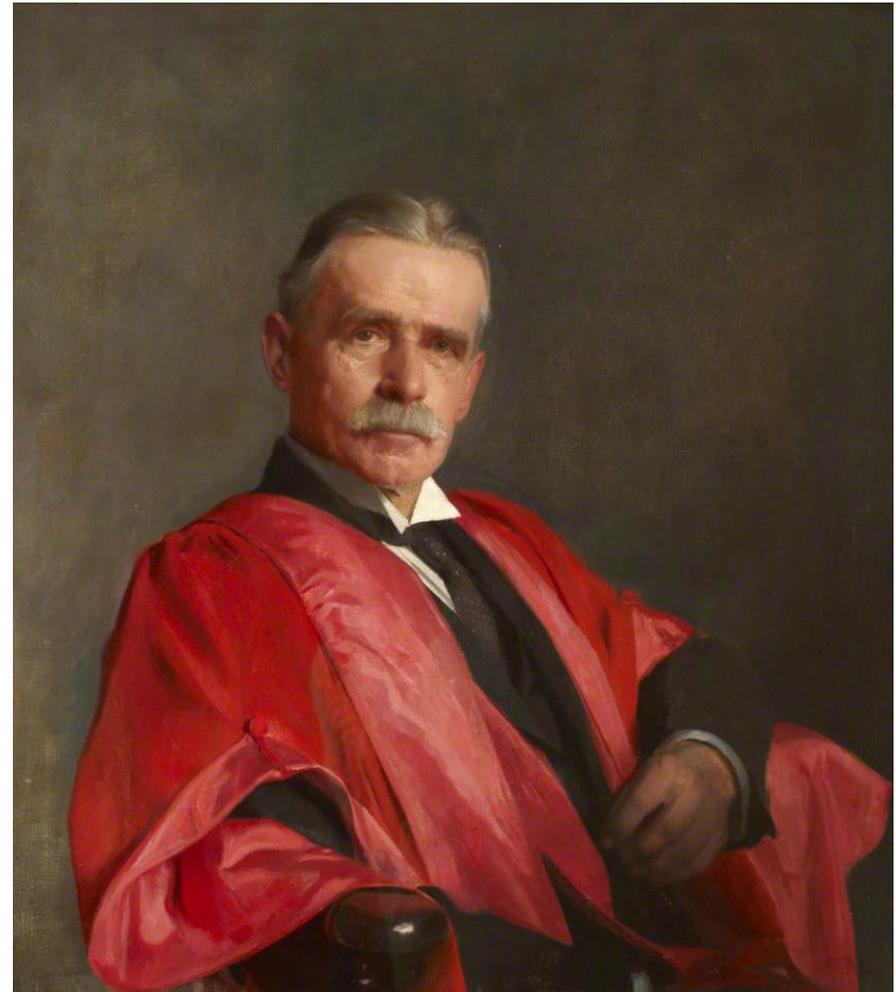
Using contemporary sources I will describe his background, early life, education, and well-known professional achievements, including the famous description of juvenile arthritis, the disease which still bears his name. I will also describe the difficult circumstances of his retirement during World War II, and his activities before his death in 1943. This will include some personal reminiscences of people who knew him and who were treated by him.

Conclusions

I will discuss the careers and achievements of rival contenders to the title of 'Father of British Paediatrics', and why Still remains pre-eminent amongst these.

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Using Resistivity Index (RI) as a Predictor of PDA Closure in Extreme Preterm Infants

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Background

Patent Ductus Arteriosus (PDA) is a common problem affecting the cardiovascular system of premature babies, with incidence increasing with the degree of prematurity. The resulting shunt has implications on the haemodynamic stability and ventilatory management of these babies; as well as being associated with longer term problems. There are different management strategies. Medical management consists of a short course of ibuprofen or paracetamol. If medical treatment fails, surgical ligation would be needed to close the duct.

This study has used the Resistivity Index (RI) as a novel measurement in the assessment of PDAs to see if the response to medical treatment can be predicted in different patient groups. The RI is calculated as $(\text{Systolic Velocity} - \text{Diastolic Velocity}) / \text{Systolic Velocity}$.

Method

All babies born under 28 weeks of completed gestation at Queen Alexandra Hospital, Portsmouth, in the calendar year of 2015 were identified from the BadgerNet electronic database. Paper notes and electronic records were examined to identify whether a PDA was diagnosed, and which treatment was given. Measurements for the size and flow through the PDA were taken from the electronic records and from reviewing saved echocardiogram images. The Resistivity Index (RI) was then calculated and comparisons between groups made by way of a two-tailed T test.

Results

A total of 58 babies under 28 weeks were born in 2015. Of these, 24 were diagnosed with PDA. All had at least one course of medical treatment, of which 11 were successful, and 13 were not and went on to need surgical ligation. There was no significant difference in the RI between the responders to medical treatment and those who did not ($p=0.49$).

On subgroup analysis, the RI was significantly lower in babies under 25 weeks completed gestation who did respond to medical treatment ($p=0.008$). Other subgroups, such as birth weight, sex and antenatal steroids did not have significantly different RIs.

Conclusions

This study looked at a small number of babies, but has shown the feasibility of using RI as a predictive marker in the likelihood of PDA closure in premature babies. Further work is needed to evaluate this fully, and to set predictive ranges.

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Acute Kidney Injury and Short-Term Renal Support in the Post-Operative Management of Neonates Following Repair of Transposition of the Great Arteries

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Background

Neonates requiring congenital cardiac surgery are at risk of acute kidney injury, associated with significant morbidity, mortality, and increased hospital length of stay; treatment may require renal replacement therapy. Data for single cardiac defect cohorts is important to stratify risk, but is lacking for transposition of the great arteries. Our study aimed at collecting data for this single lesion.

Method

A single-centre, retrospective analysis of 71 cases of arterial switch operation in neonates with isolated transposition of the great arteries, or transposition of the great arteries with ventricular septal defect, presenting between 2005-2015. Analysis included assessment of length of stay, renal function and need for renal replacement therapy.

Results

Acute kidney injury developed in 50.7%, and was associated with longer paediatric intensive care and hospital stays ($p < 0.05$). Paediatric intensive care unit length of stay correlated with higher peak creatinine and urea ($p < 0.05$) and also with higher lactate levels at paediatric intensive care unit admission and 1 and 6 hours post-admission ($p < 0.05$). Renal replacement therapy via peritoneal dialysis was delivered to 11.1%, however this did not prolong paediatric intensive care unit length of stay. Initiation of renal replacement therapy was associated with a positive fluid balance at 1 and 6 hours ($p < 0.05$).

Conclusions

This study analyses renal outcomes in a cohort of neonates with transposition of the great arteries undergoing an arterial switch operation. Acute kidney injury is a significant complication, with accompanying need for renal replacement therapy. Development of acute kidney injury, and a positive fluid balance, were both associated with increased length of stay. Initiation of renal replacement therapy was not associated with increased length of stay, and with some evidence from the literature that early or prophylactic peritoneal dialysis catheter insertion improves outcomes, these data report minimal complication rates which may be important when deciding to utilise peritoneal dialysis.

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"Bringing Joy" to Child Health: Improving staff wellbeing and satisfaction

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Background

Low morale and poor staff retention is a present and significant threat to the NHS (e.g. BMA, 2016). 'Team Joy' (TJ) is an initiative across Child Health that aims to improve the morale, motivation, wellbeing and resilience of all the staff in the department (medical, nursing, allied health professionals, administrative). Inspired by IHI funded training, with the emphasis on "what matters" to staff, representatives across professions are engaging with staff to generate ideas and actions to increase "joy" in the workplace.

Information was collected from numerous sources: face-to-face conversations, semi-structured group discussions, email, "comments slips", and pre-existing staff survey data. This data would enable changes to be generated from staff in a bottom-up and meaningful manner.

Method

A 5-point likert scale measuring "how much did you enjoy your day at work today?" was distributed daily to an opportunity sample of staff across child health during a week in Spring 2018. Subsequently, snapshot "joy levels" were measured at weekly intervals to track ongoing trends in "joy" levels as awareness increased and interventions were made. Data were plotted on a run chart.

Results

The successful 'Christmas Stars' initiative sparked the TJ work stream, and TJ followed this up with 'Easter Eggsellence'. Since then, TJ have worked to raise their profile and have explored practical changes to implement, some of which have been successful (e.g. ensuring all child health groups are included on email lists), and others have been more difficult to implement. Barriers to implementation appear to be related to lack of funding and time to implement projects, as well struggling to engage staff who feel that managers are not supporting "front line" staff. Baseline "joy levels" ranged from 3.34-4.16 (range = 1-5 with 5 being the maximum) across child health.

Conclusions

Whilst it is too early in the project to draw conclusions, it is hoped that positive effects of the TJ initiative will improve staff morale and wellbeing and contribute to attitudinal and cultural changes in staff member's relationships to their work. This forms part of a larger piece of work looking at staff wellness including sickness and retention.

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Neonatal Antibiotics: Keeping Mum and Baby Together

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Background

Babies with risk factors requiring antibiotics were coming to the neonatal unit (NNU) for cannulation and the first dose of antibiotics. There were delays in the baby transferring and antibiotic administration as well as separation of mother and baby. The NICE neonatal early sepsis guideline (CG149) aims for antibiotics to be administered within one hour; our survey revealed the average time was 142 minutes. NHS Improvement and NHS England both have targets to keep mother and baby together. Interrupting the normal bonding process has lasting impacts on maternal mental health and breastfeeding. The midwives were struggling to provide essential postnatal care to mothers if they took the baby to NNU for antibiotics. The aim was to take the cannulation process to labour ward (LW) and administer cefotaxime there.

Method

Multidisciplinary team (MDT) working with neonatal consultant, ANNP, neonatal matron, labour ward coordinator, consultant midwife and pharmacist meant that identified problem areas could be addressed quickly. The project is being rolled out within 3 months of initial discussions.

A campaign to "Keep mum and baby together" has ensured a positive reaction from midwives. They are being trained in neonatal antibiotic administration and how to comfort a baby during cannulation. For

neonatal staff, education at induction in September is planned, as well as posters and 'staff champions' reiterating the message. Cannulation grab bags, designated procedure areas and a plan for escalation if unsuccessful has been made.

Results

A survey about staff attitudes was analysed in June 2018. This revealed concerns over staffing and support, anxiety about cannulating with parents and equipment availability. These issues are being focused on. There is a plan to re-audit the time to first dose of antibiotics after 3 months of implementation.

Conclusions

This project is being implemented in September alongside new neonatal sepsis guidelines and the introduction of the Kaiser sepsis risk tool. These processes will reduce the number of babies requiring antibiotics which further supports the transition of this procedure to LW. A challenging multidisciplinary staff culture change is key to the success of this project.

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Home Monitoring Programme

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Background

Children born with Hypoplastic left heart syndrome (HLHS) are at highest risk for morbidity, growth failure and mortality (5-20%) following discharge home after 1st stage Norwood/Sano shunt surgery, until the second stage surgery (Glenn Shunt). Prior to 2017 HLHS babies at UHS, remained as in-patients during the inter-stage period (3-6 months). The Home monitoring programme (HMP) uses daily baby weight, saturations and enteral intake recorded by parent/carer aims combined with 2 weekly cardiac reviews to detect subtle variances that may precede clinical deterioration. This has resulted in improved inter-stage survival in North America (Ghanayem 2003).

Aim

Early identification of physiologic variances using a 'red flag' system, enabling timely response and intervention.

Improve survival and reduce morbidity in both single ventricle infants and those with increased risk of mortality who would benefit from enhanced monitoring prior to corrective surgery.

Optimize growth in this patient population. Poor growth = poor outcomes (Marino 2018).

Collaborate with parents, referring cardiologists, paediatricians and local nursing teams to care for these children in their own homes, ensuring rapid access to appropriate levels of hospital care when needed.

Outcome

Collaborative development of 'Red flags' and acute deterioration flow chart with Oxford and Southampton congenital cardiology network. Weekly nurse-led telephone consultations.

Improved communication, guidance and teaching with parents and health professionals.

Reduced in-patient days 2017 see audit below

Identification of barriers to HMP (clinically unstable, language, parental learning difficulties, safeguarding) has led to the development of exclusion criteria. Exploration of remote monitoring in referring hospital

Audit

4 patients in 2017 reduced inpatient stay

Conclusions

Early identification of the breaching of red flags, allowed the early detection and intervention of physiologic deteriorations. HMP enables safe inter-stage care at home for families meeting the inclusion criteria.

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Standardising postnatal ward guidance; The Clinical Aid folder

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Background

At Princess Anne Hospital, plans for babies with common postnatal problems were either being made from an old out of date folder, bits of paper stuck to the wall, extensive online guidelines to sift through or by Consultants who had a different management plan depending on who you asked. The postnatal ward is busy; change was needed to restore harmony for the staff working there.

Method

Clinical Aids were created - one page quick reference guides with salient information. These were either created from already published guidelines or new ones created in conjunction with advice from local experts in each field.

- It is split into sections:
 - NIPE (Newborn Infant Physical Examination)
- Baby check findings (including neonatal skin condition pictures, orthopaedics, antenatal renal diagnoses)
- Common postnatal ward problems (early onset sepsis, late preterm babies, weight loss, jaundice)
- Maternal problems affecting the infant (infection, thyroid, substance misuse)
- Referrals

Referral and GP letter templates were also created to streamline communication about common problems. The junior staff can create a Clinical Aid in a more timely fashion than a formal trust guideline. They

can see it in practice within their job rotation which is beneficial for their portfolio.

Results

The Clinical Aids are being used daily by junior doctors and Advanced Neonatal Nurse Practitioners (ANNP's) on the postnatal ward. I am awaiting survey results to give more formal feedback about the effectiveness of this intervention and to guide future improvements to it.

Conclusions

I have received feedback that the postnatal ward Clinical Aid folder has been well received by staff working on the shop floor. The junior doctors and ANNP's have helped to make and shape the content so it is relevant to their needs. It is an evolving project which I aim to make electronic and share with the regional network in the near future.

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Improving Assessment of Sedation during Opioid Administration in Children's Pain Management at Southampton Children's Hospital

Elizabeth Waddington, Southampton Children's Hospital

Background

The introduction of PEWS in 2012 saw the adoption of AVPU to assess a child's sedation level when receiving opioid pain management techniques. Despite education around the importance of sedation assessment for these children, over the last 3 years evidence of inaccurate or absent documentation of AVPU on the patient's Pain Management Observation Chart increased.

Respiratory depression is the most serious of the opioid adverse effects. Less opioid is required to produce sedation than to produce respiratory depression. Therefore systematic assessment of a patient's sedation level reduces the risk of them reaching the level of sedation causing respiratory depression.

Method

Retrospective data for all paediatric patients receiving intravenous opioids in September 2017 provided a baseline for the trial. An adapted version of the Pasero Opioid-induced Sedation Scale (POSS) (Pasero, 2009) was trialled on two wards which frequently care for patients receiving opioid pain management. Outcome Measures:

- Percentage of patients with hourly AVPU/POSS scores documented on Pain Management Observation Chart.
- Percentage of raised AVPU/POSS scores being appropriately escalated to medical staff/pain team.

Results

More patients received hourly sedation scores in the trial period compared to AVPU scores in the baseline period (see results table).

Anecdotal user feedback was also gathered during and following the trial. Feedback for POSS was positive; particularly clarification of documentation for when a child is asleep.

Conclusions

Although no significant improvement in documentation was evident, it remains inappropriate to use a conscious level tool (AVPU) for the assessment of a patient's sedation level. With positive feedback from nurses and no increased risk identified a change in practice was agreed. POSS has now been adopted as the 'sedation tool' for the Children's Hospital; education has commenced and future audits will continue to monitor its safety. Pasero, C. (2009) Assessment of Sedation During Opioid Administration for Pain Management. *Journal of PeriAnesthesia Nursing*, 24(3), 186 - 190.

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Every Breath that you Take: Tracheostomy ventilation in paediatric palliative care

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Background

Children's palliative care is changing. Medical and technological advances enable an increasing number of children with life limiting conditions to survive on long term ventilation (LTV) via tracheostomy. A specialist hospital identified that children can spend months in hospital despite being discharge ready, waiting for adaptations to accommodation, and the establishment of a care package. This can have a significant impact on family life, effecting relationships, finances, and daily living.

Aims

- To set up a unit for tracheostomy ventilated children within a Children's Hospice in partnership with the hospital. This unit would provide accommodation and nursing support for 3 children and families in preparation for discharge home.
- Facilitate care of child outside the hospital environment.
- Establish a programme of staff training and development for the LTV Unit.

Methods

October 2016-March 2017:

- Literature review
- Partnership working with the hospital respiratory team
- Agreed practice framework
- Development of the infrastructure

March 2017 - October 2017:

- Collaboration with the specialist paediatric respiratory, and hospice palliative care teams
- Workforce planning
- Development of clinical pathways, policies and standard operating procedures; clinical governance.
- Practice Education team develop monthly LTV Study days and
- Clinical Competency Framework, with ongoing review of clinical knowledge and skills.
- Preparation of child and family for transfer from High Dependency Unit to hospice.

Results

November 2017: Admission of first tracheostomy and ventilated child and family from HDU to unit.

- Child resident for 6 months, successful weaning off day time ventilation.
- No complications or significant infections acquired
- Saved hospital bed days: 183.
- Staff competency increased from 47% to 93.5%.
- Maintained good relationship with family

Conclusions

Proved the concept that with robust education and governance, tracheostomy ventilated children can be safely cared for in a hospice environment. The family report that the environment had a positive impact on family dynamics; improved the child's physical health and emotional well-being

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Collaborative Learning in Practice

Lauren Thain, Southampton University NHS Foundation Trust

Background

Southampton Children's Hospital is implementing a new model of supervision for pre-registered nurses. The Collaborative learning in Practice model (CLiP) was borne out of the findings of Duffy's (2003) report 'failing to fail students'. This model of supervision addresses the failings within the current learning environment by immersing students within the clinical environment; giving them the autonomy to deliver patient care under the direct supervision of a registered nurse, the 'day coach'. The process uses a coaching model rather than the historic 1:1 teaching method empowering the student to identify their own learning needs through practice rather than being led by a mentor where there strengths and weaknesses are not easily identifiable.

Method

Multidisciplinary team support (MDT) is required to ensure students achieve their competencies within the learning environment. Ward staff are given guidance and support by the clinical education team regarding the role of the day coach and practice assessor.

A daily log is completed by the day coach and student to identify learning aims and achievements for each day. This acts as an evidential log report for the practice assessor to make an informed decision to sign off competencies and complete programme interviews.

Results

Although still in the pilot phase, the CLiP model has already been disseminated beyond the pilot site. Student evaluations are extremely positive and the MPT are adapting well.

Conclusions

CLiP empowers students to take responsibility for their own learning. It promotes development in areas of clinical practice, a professional development that previous models of supervision did not embrace. Through the support of the day coach student nurses build confidence and have better opportunity to link theory with practice. It also affords more opportunity to identify and support development needs in a timelier manner.

Duffy, K. (2003) Failing Students: a Qualitative Study of Factors that Influence the Decisions Regarding Assessment of Students' Competence in Practice. nmc- uk.org

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Mental Well-Being Support for NICU Parents - A UK survey

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Background

NICU parents are at high risk of developing anxiety, depression and post-traumatic stress disorder. This can have a detrimental effect on parental health, relationships and later development of the baby. Early identification of parents in need of psychosocial support and further provision of low-level psychological interventions by a Neonatal Mental Health Professional (NMHP) can be a preventive strategy.

There is currently no standardised national psychosocial framework for NICU. The aim of this study was to establish the current provision of psychosocial support in Level-III NICUs in the UK and inform the development of a UHS framework to support NICU parental mental well-being.

Method

An online national survey of all Level-III Neonatal units was conducted to establish the modelling of psychosocial support services. A UHS NICU staff survey was conducted simultaneously to ascertain resources required for staff to facilitate the psychosocial framework. Finally, a

parental survey was conducted to canvass their views on the provision of emotional support.

A daily log is completed by the day coach and student to identify learning aims and achievements for each day. This acts as an evidential log report for the practice assessor to make an informed decision to sign off competencies and complete programme interviews.

Results

70% of neonatal units have a dedicated NMHP but variability was seen both in number and type of staff providing the service (figure 1). Provision of supportive groups with therapeutic intervention also showed variation (figure 2). Screening tools for parental well-being are used only in 5 units (15%) but even between these units variation exists. 50% of neonatal units had information around psychosocial issues and resources available to parents in the unit information leaflet. Lack of dedicated staff educational sessions on parental psychosocial issues was evident along with variation in psychosocial support for the staff supporting parents in these intense environments. Parents echoed the need for more emotional and mental health support not only during NICU stay but also post discharge. The majority of parents were open to taking part in a screening process.

Figure 1: Neonatal Mental Health Professionals (NMHP) in the Level-III NICU

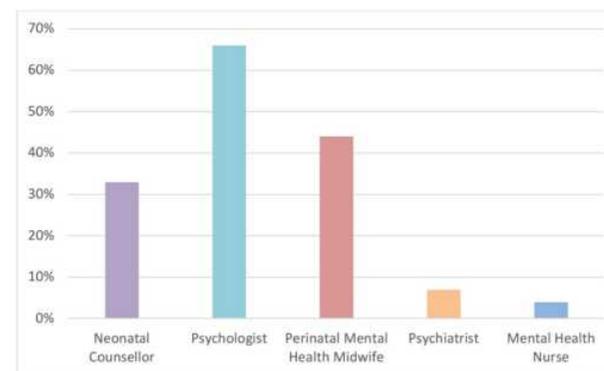
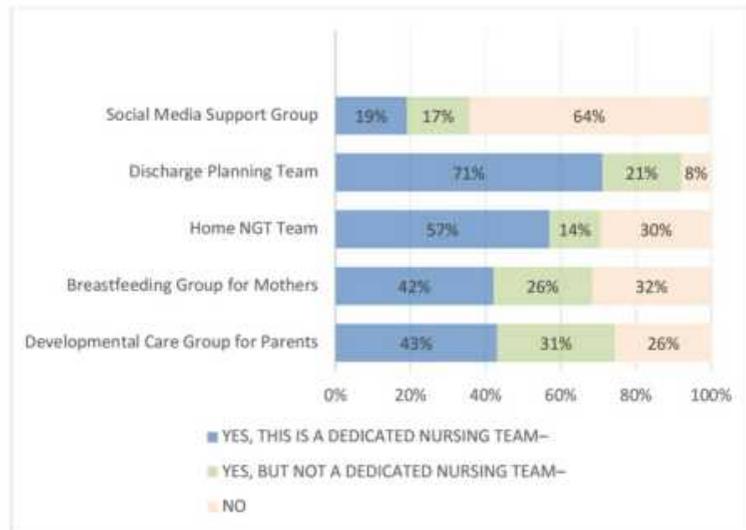


Figure 2: Supportive group with therapeutic intervention to empower and support parents



Conclusions

The need for a robust service supporting the mental and emotional health of parents in NICU is evident. The survey highlights variation in services and the need for standardisation. The results from these surveys will inform the development of a framework to support psychosocial well-being of NICU parents, including early identification, using a well-being screening tool.

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Plan to care or care to plan?

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Background

To produce regional standardised care plans for common paediatric medical conditions. It was identified by colleagues and parents that the care plans used on the ward were out-dated and lacked structure. The aim was to produce a succinct care plan template incorporating PEWS (Paediatric Early Warning Score) with a clear escalation process; and in keeping with current NICE (The National Institute for Health and Care Excellence) and PIER (Paediatric Innovation, Education and Research Network) guidelines.

Method

A working group was created to critique the existing care plans, identify conditions that were missing and design a generic template with a systematic Airway, Breathing Circulation format. We used results from previous documentation audits to highlight areas that needed improving, and lessons learnt from DATIX incident reporting. 25 people, including staff members and parents were then asked to provide feedback on the original care plans and the new design.

Results

Having piloted the new care plans on the ward, positive feedback was received and minor adjustments made. Of the 25 people asked, 100% preferred the new layout. The new layout was felt to be: 'user friendly', 'very clear with good rationale', and 'thorough and logical'. We anticipate

that this will save nurses and student nurses time and provide guidance to those less experienced in caring for these conditions.

Conclusions

The newly devised care plans provide the following:

- Current evidence based care in keeping with regional and national guidance.
- Clear escalation process for the deteriorating child.
- Holistic patient centred care.
- A tool to ensure excellent documentation and releasing time to care.
- Potential for regional use, providing continuity for those working across the region. E.g. student nurses, trainee Doctors, and parents.

The future plan is to trial the care plans on other paediatric wards throughout the region and audit how useable they are within these Trusts.

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Improving the use of sucrose as analgesia in the Neonatal Unit, Wishaw Hospital

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Background

Sucrose has consistently been found to be a safe and effective analgesic in neonates. However, it is frequently underused and poorly documented. We aimed to investigate our use of sucrose and ways in which we could improve.

Method

We collected data on analgesia use in 51 babies discharged from our unit in January 2018. We distributed 30 questionnaires to staff to ascertain their views on our use of sucrose. We performed two interventions from February to March 2018. The first was staff education sessions: one for medical staff, and six sessions for nursing staff. The second intervention was the introduction of a sucrose documentation sheet. We then re-audited our data in 36 babies admitted in May 2018.

Results

73% of surveyed staff felt sucrose should be used in all babies regardless of gestation. 60% felt that sucrose was being used less than 50% of the time prior to painful procedures. 95% of babies in both cohorts were ≥ 32 weeks. Prior to interventions, sucrose was documented as given in 1/51 babies in January, in a total of 1/627 procedures. Following interventions, 27/36 (75%) babies had documented use of sucrose during admission, in a total of 78/349 (22%) painful procedures (0.16% pre intervention, 22% post, $p < 0.0001$).

Conclusions

Following staff education sessions and the introduction of a sucrose administration sheet, the use of sucrose as analgesia has improved, with 75% of babies now having documented use of sucrose during their admission. The sucrose administration sheet is currently under consideration for implementation across the West of Scotland deanery.

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Using Point of Care Ultrasound (POCUS) to assess children with respiratory failure

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Background

Point of care ultrasound (POCUS) is well established in adult emergency medicine and critical care. It is used for immediate diagnosis and evaluation of the impact of bedside interventions in the acutely unwell child.

This article highlights how ultrasound can be helpful in paediatric practice when dealing with the neonate, infant or older child with undifferentiated respiratory distress, respiratory failure or ventilation problems. It highlights indications for use, key diagnostic features of common pathology and outlines the benefits of POCUS in everyday practice.

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Incidence of paediatric inflammatory bowel disease continues to increase in Wessex

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Background

Incidence of paediatric inflammatory bowel disease (PIBD) has increased in worldwide over the last 20 years. Crohn's disease incidence is increasing at a faster rate than ulcerative colitis and appears to be the main driver behind the overall increase in IBD incidence. The reasons underlying this apparent increase in disease are unclear but there appears to be an environmental role in genetically susceptible individuals. This study aimed to detail recent data from Wessex.

Method

Data were collected from the prospective PIBD database at Southampton Children's hospital from January 2013 to December 2017, and combined with data from 2002-2012. At-risk population aged <17 years was determined by postcode-population data from the office of national statistics. Subclassification (gender and age of diagnosis) analysis was conducted directly from the data. Statistical analysis of the data were conducted using Pearson's χ^2 test for comparison of cohort data, Mann-Whitney U-test for comparison of age of diagnosis and by simple linear regression for analysis of incidence by year

Results

Incidence rose between 2002-2017 from 6.58/100,000/year (2002) to 7.71/100,000 (2013) to 10.54/100,000/year (2017) ($R^2=0.464$, $p=0.004$). Incidence of PIBD (2013-2017) averaged 8.80/100,000 per year, higher in males (10.84/100,000/year) versus females (6.63/100,000/year) ($p=0.0001$). Crohn's disease (5.25/100,000/year) was more common than ulcerative colitis (3.31/100,000/year) ($p=0.0002$). Incidence of PIBD was higher in older children- 11-16 years; males- 22.00/100,000/year and females; 11.75/100,000/year. This compared to an incidence of IBD in the 6-10 age group of 5.58/100,000/year in males and 6.27/100,000/year in females. In the 0-5 years age group incidence of IBD was 1.34/100,000/year in males and 0.7/100,000/year in females ($p=>0.05$).

Conclusions

The incidence of PIBD continues to increase. Increasing population size and increased incidence translate to a significant increase in prevalence of PIBD. This has implications for delivery of paediatric gastroenterology services.

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Can a novel, interactive online calculator improve neonatal cranial ultrasound practice?

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Background

- Indications and timings of neonatal cranial ultrasounds (US) can be a difficult subject to commit to memory, particularly for the clinician with little neonatal experience.
- Our aim was to assess neonatal cranial US practice within Portsmouth neonatal unit against trust standards, and to subsequently develop an online calculator which would calculate predicted dates of cranial US, unique to an individual infant's date of birth and gestation.

Method

- We used standards taken from the Portsmouth Neonatal Cranial US guideline, which specified frequency of scans (days 1,3,7,14,28, term equivalent for <30 weeks/at least 1 cranial US for 30-33+6 weeks) and when scans should be "watched live/performed" by a consultant.
- Our population was a sample of preterm babies on the unit on one day in January 2018, born between 24 and 33+6 weeks gestation. These infants' notes were reviewed and cranial US documentation analysed.

- We then created an online calculator which requires the user to input the infant's date of birth, gestation and birth weight. The calculator subsequently works out predicted dates for cranial US, in addition to predicted dates for 2,3 and 4 month immunisations and a predicted date for the initial retinopathy of prematurity exam (if applicable). This is printed and filed in the notes for reference.

Results

- We analysed 13 sets of notes. Of these, 9 infants were born <30 weeks gestation and 4 infants born 30-33+6 weeks gestation.
- Of those infants born <30 weeks gestation, all had scans within 0-3 days of guideline standards and all had at least one scan "watched live/performed" by a consultant. Of those infants born 30-33+6 weeks gestation, all 4 had at least one scan.

Conclusions

This project is still in its infancy and we plan to reassess practice following the introduction of the calculator to clinical practice. The calculator has received very positive feedback from both junior and senior staff. We hope that its use can help to maintain quality and safety on the neonatal unit, in addition to serving as an educational tool for the clinician with little neonatal experience.

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Prostaglandin Preparation and Administration Audit

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Background

Prostaglandin is used in neonatal emergencies in infants with duct dependent congenital heart defects. If the duct closes in this condition, infants are at risk of progressive hypoxia and metabolic acidosis. Prostaglandin will maintain ductus arteriosus patency and can reverse closure.

However there is great difficulty in preparation and administration of prostaglandin in an emergency. These difficulties were made clear during a practical paediatric emergency moulage organised by the Southampton Oxford Retrieval Team in Dorset County Hospital. There was a delay in identifying the need for prostaglandin, it was not common knowledge where to find it or how to draw up and administer it. Senior team members were required to switch their attention from their main job of either team leading, managing the airway or setting up other infusions to help with this specific task. This resulted in delayed administration, task focusing and patient deterioration.

Aim

To determine the familiarity of anaesthetic consultants in Dorset County Hospital with prostaglandin preparation.

Method

A questionnaire was sent out to all anaesthetic consultants who have the potential to be called to a paediatric arrest. The questionnaire tested knowledge of where prostaglandin vials were kept, the concentration and volume of these vials and the concentration required for the infusion.

Results

12 of the 16 consultants responded. 3/12 knew where the prostaglandin was kept in DCH, 11/12 were unsure of the concentration of vials, 10/11 were unsure of the volume. 10/12 were unsure of the concentration required for infusion.

Analysis

Few of the consultants were confident in using prostaglandin in a duct dependent emergency, as it is not a drug used in day-to-day practice at DCH. DCH uses clinical guidelines set out by SORT, however it can be difficult to locate these in stressful situations.

Recommendations

DCH has developed an emergency prostaglandin box containing all the equipment required to prepare the infusion and a simple guideline kept inside it. This has been endorsed by SORT and its usefulness will be re-evaluated in a real paediatric emergency or the yearly paediatric emergency moulage.

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Improving newborn physical examination screening (NIPE) practice in infants transferred to a tertiary children's cardiac unit.

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Background

All infants born in England should have a newborn physical examination (NIPE) as part of the Public Health England (PHE) newborn NHS screening program.

Our aim was to improve NIPE practice in infants transferred to Southampton Children's Cardiac Unit from Southampton's Neonatal Unit, in keeping with Public Health England (PHE) 2016/17 NIPE standards.

Method

We used the PHE 2016/17 NIPE standards to retrospectively assess timing of NIPE and timeliness of intervention for three main NIPE components: hips, eyes and testes.

Our population was all newborns transferred to the children's cardiac unit from the neonatal unit in 2016, retrospectively identified using the cardiac unit's admissions and newborn blood spot test logbooks. The online "NIPE smart" system was used to assess timing of NIPE and examination outcome. Online electronic record systems were used to assess the timelines of intervention for the three NIPE components.

After initial data collection, a failsafe mechanism was implemented. This involved administrative staff regularly checking the "NIPE smart" system and flagging up incomplete NIPES to nominated medical staff. We

facilitated access to the NIPE smart system on cardiac unit computers and provided training to cardiac unit staff on how to use the NIPE smart system.

NIPE practice was retrospectively reassessed from March to July 2017, using the above methods.

Results

Prior to our intervention, only 16/33 (48%) of infants transferred had a NIPE completed within 72 hours of birth, with 15 infants having no documented evidence of a NIPE being performed prior to discharge from the cardiac unit. Following intervention, all 9 infants had documented evidence of NIPE completion and 8/9 (89%) had their NIPE completed within 72 hours of birth.

100% compliance with the other PHE NIPE standards was maintained following intervention.

Conclusions

This project revealed that many newborns transferred to the cardiac unit were being discharged without a NIPE. The failsafe mechanism implemented resulted in a significant improvement in NIPE practice. We hope that, as a result of this project, potential morbidity from late diagnosis of treatable congenital abnormalities (such as developmental dysplasia of the hip) will be avoided within this population.

Structured Transition is Associated with Improved Health-Related Outcomes in Type 1 Diabetes

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Background

The current transition process is often fragmented and not delivered in a timely and effective way with young people (YP) transferring to adult services feeling unprepared and uninformed. A structure transition programme has been introduced into clinical care in the YP diabetes clinic. The aim of the study was to assess the impact of this structured transition tool for YP with type 1 diabetes in the transition from paediatric to adult services.

Method

In a retrospective observational study, the casenotes were reviewed for young people (YP) with Type 1 diabetes that transitioned between children's and adults services at a single tertiary centre between 2011 and 2014. YP were categorised as to whether they had experienced the 'Ready Steady Go' (RSG) structured transition programme during routine clinical care (RSG versus non- RSG). Comparisons were made between the groups evaluating changes in HbA1c, cholesterol, BMI, non-elective, diabetes-related hospital admissions and documentation of advice.

Results

Of 106 reviewed case notes, 71 YP underwent structured transition utilising the RSG transition programme. In evaluation pre and post-transfer of care, undergoing the RSG programme was associated with a lowering of non- elective diabetes-related hospital admissions (RSG $p=0.008$ versus non-RSG $p=1.000$) and non-HDL cholesterol (RSG $p=0.049$ versus non-RSG $p=0.921$). The widely observed rise in HbA1c post transition was not observed in YP undergoing the RSG programme (RSG $p=0.629$ versus non-RSG $p=0.023$). No differences were observed in total cholesterol or BMI. Additionally, those who underwent structured transition had higher rates of documentation surrounding key topics; including contraception and pregnancy ($p=0.005$).

Conclusions

This study supports the role of a structured transition tool for YP with type 1 diabetes transitioning from paediatric to adult services. Improvements in markers of metabolic and diabetes control were observed in YP utilising the Ready Steady Go Programme.

Neurodevelopmental Follow-up of Extremely Preterm Babies

Caroline Storey, Southampton (NICU)

Background

The new (August 2017) NICE Guidelines on developmental follow-up of children and young people has introduced a new recommendation that babies born before 28 weeks gestational age have formal educational psychology follow-up at four years of age. This is a change from previous guidelines, which recommended discharging preterm babies after a normal neurodevelopmental assessment at two years corrected gestational age. The purpose of the study was to assess whether the four-year educational psychology follow-up would provide any added value, and what level of resources would be required to implement the guidelines.

Method

This retrospective study looked at all babies born under 28 weeks in 2012 in a particular unit, to see their neonatal, two year and four year outcomes. Data was gathered from neonatal records and medical notes, as well as phone calls to the parents of those children who had been discharged.

Results

Approximately two thirds of babies survived. Of the surviving babies, half were developmentally normal at their two-year follow-up, and were discharged. The other half were under neurodevelopmental follow-up. Of those children who were developmentally normal at two years, all but one were in mainstream education and none had been referred to community paediatric services. The child who was not in mainstream education was being home-schooled for unrelated reasons.

Conclusions

Since the children who were discharged at two years have not gone on to require paediatric services, it is uncertain whether the significant cost incurred by having four-year follow-up, and thus being compliant with the 2017 NICE Guidelines, would be justifiable. Further studies around longer-term psychological, neurodevelopmental and general health outcomes may be informative.

Improving medication safety in a low resource setting

Jackie Gillespie, Southampton

Objectives

Whilst working in a Ugandan government hospital as a Global-links volunteer with the RCPCH, it was noted that doses of Gentamycin were at times being inaccurately prescribed.

Gentamycin is a widely used antibiotic in Uganda and is a first-line choice for infection and burns. Gentamycin has a narrow therapeutic margin and potential harmful effects include ototoxicity and nephrotoxicity. These are dose related and relative risk is reduced with accurate prescribing for weight.

This patient safety project involved an audit reviewing gentamycin prescribing on a paediatric ward. This led to a development plan looking at strategies to improve safer medication prescribing and administration.

Method

Retrospective audit of paediatric patients admitted on gentamycin during a two-week study period. The patients documented weight (actual or estimated) and gentamycin dose prescribed were recorded. Hospital guidelines were used to calculate the appropriate dose of gentamycin and deemed accurate if within 5% of this figure.

Results from the audit suggested significant improvements could be made to gentamycin prescribing safety (figure 1). A significant number of children did not have any weight recorded and calculated doses of gentamycin were frequently inaccurate.

A number of initiatives were designed to tackle this. These included teaching seminars for prescribing clinical officers and nurses to stress the importance of accurate weight based prescribing, checking drug prescriptions and drug administration and posters in clinical areas showing drug calculation doses.

Results

A repeat audit following the interventions showed improvement. The measurement of children's weight increased from 68% to 85%. This has potential to improve safety of all medication prescribing. The accuracy of gentamycin prescribing improved from 40% to 64%. Whilst there is still scope for improvement, it is hoped with further education and support this will be observed.

Conclusions

Working abroad in a low resource setting is challenging but incredibly rewarding. I hope this project provides some insight of the goals that can be achieved through working with local staff and coordinating QI projects; and may motivate other paediatric consultants and trainees to consider their own opportunities in improving global child health.

Severe Pertussis Infection, Exchange Transfusion and the Importance of Immunisations

Vinnie Vijay, Paediatric Trainee

Background

We present a case of severe pertussis infection to discuss the evidence that exists for exchange transfusion, highlight the potential complications of this procedure and the difficulties of thrombolysis in neonates. Finally, we emphasise the importance of immunisations.

Case Report

A term infant presented with 7-day history of cough, gagging with feeds and lethargy. She developed progressive respiratory distress and significant secretion load requiring mechanical ventilation and transfer to PICU.

She deteriorated with worsening hypoxic respiratory failure and required inhaled nitric oxide and prone positioning. Hypotension was managed with inotropes and vasopressors. White blood cell count was significantly elevated at $67.4 \times 10^9/L$ with a lymphocytosis $29.7 \times 10^9/L$. Urgent microbiology results confirmed *Bordetella Pertussis* DNA on nasal pharyngeal aspirate. On discussion with the family, the pertussis vaccine had not been encouraged during the pregnancy.

Based on the worsening lymphocytosis, confirmed Pertussis diagnosis, and recent evidence from Tian *et al.* demonstrating the efficacy of exchange transfusion in severe pertussis infection, the decision was made to proceed with a double volume exchange transfusion. Half way through there was haemodynamic and respiratory compromise with evidence of pulmonary hypertension requiring FiO₂ 1.0, iNO 20ppm, fluid resuscitation, significant escalation of vasopressor support and

neuromuscular blockade. An Echo demonstrated a large thrombus in the right ventricle with likely distal pulmonary emboli. Following discussion with the multidisciplinary team and a second PICU, Alteplase was administered. Anticoagulation continued with Heparin followed by Enoxaparin. Antimicrobial therapy consisted of a macrolide and third generation cephalosporin.

Over the course of 2 weeks there was marked clinical improvement resulting in successful extubation and weaning off vasopressors. Subsequent Echos demonstrated resolution of the clot. At discharge she was self-ventilating in room air, alert and re-establishing breastfeeds.

Discussion

Pertussis infection continues to be an important public health concern worldwide, and it's most severe form has an associated mortality of up to 80% in infants. Hyperleukocytosis is driven by the release of pertussis toxin, and is associated with poorer outcomes. Exchange transfusion has been shown to reduce the burden of hyperleukocytosis and therefore reduce mortality of severe pertussis infection in infants.

This case highlights the challenges of thrombolysis in neonates. Surgical thrombectomy was not possible in view of the likely distal pulmonary emboli associated with the RV thrombus. Therefore, pharmacological thrombolysis was used. Ultimately, there was resolution of the RV thrombus and return to normal lung function.

Finally, this case is presented to raise awareness regarding the importance of immunisations both during pregnancy and throughout childhood to optimise protection against this highly infectious, and potentially devastating disease.



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