A REVIEW OF LUMBAR PUNCTURES PERFORMED FOR EARLY ONSET NEONATAL SEPSIS IN A TERTIARY NEONATAL UNIT BETWEEN 2016 AND 2020

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Aims:
To describe lumbar puncture (LP) practice in a tertiary Irish Neonatal Unit due to concern for Early Onset Neonatal Sepsis (EOS) including incidence of positive cerebrospinal fluid (CSF) results and use of C-Reactive Protein (CRP) thresholds for LP.
Methods:
A retrospective electronic chart review of neonates who were born in CUMH at greater than 35 weeks gestational age (GA) from 01/01/2016 until the 31/12/2020 who underwent a LP due to concern for EOS. Neonates were identified based on CSF reports from the Microbiology lab and verified against electronic chart pharmacy records of neonates who received greater than 3 days of intravenous benzylpenicillin or cefotaxime.
Results:
676 neonates were treated for greater than 3 days with intravenous antibiotics due to concern for EOS (23/1000). 205 LPs were undertaken (7/1000) and 7/205 were positive (3.4%). 18 neonates had proven bacteraemia (0.62/1000). There were 6 cases of culture/PCR negative CSF with a high cell count concerning for ventriculitis and 1 case of culture positive group B streptococcus meningitis in the setting of bacteraemia. The incidence of confirmed or suspected bacterial meningitis was 0.24/100. The incidence of confirmed bacterial meningitis was 0.034/1000.
Conclusion:
In neonates without bacteraemia or signs of meningism, none had suspected or confirmed bacterial meningitis with a pre-LP CRP less than 45 or a maximum CRP less than 50. Due to known statistical issues with rare events, our aim was never to provide a statistically significant CRP threshold as an indication for LP. However, clinicians practicing using higher CRP thresholds of 40 versus 20 in neonates without other clinical indications for LP can be reassured by this study. Using the higher CRP threshold of 40 in this cohort would have prevented 34 LPs (8.5 LPs per year) without missing a case meningitis.

* Incidences are measured in live births over 35 weeks gestational age

REDUCING DONOR BREAST MILK BOTTLE SIZE TO OPTIMISE BENEFIT

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Aims

Mother's Breast Milk (MBM) is the optimal enteral feed for babies of all gestations, providing various health benefits particularly to sick and pre-term infants in the NICU. Donor breast milk (DBM) is a commonly used alternative internationally for pre-term and VLBW infants when mother's milk is in short supply or unavailable [2]. In Ireland, DBM costs £450-550 per litre, and is only distributed in 100ml bottles. Each opened bottle is fit for single day and single patient-use only.

Our aim was to quantify the wastage of donor breast milk in The Rotunda Hospital NICU, and consider in turn the cost implications of this wastage.

Methods

We performed a quality improvement study to evaluate the amount of donor milk wasted in our NICU. The feeding charts of nine infants who received DBM between 2020 and 2021 were reviewed to calculate the typical volume of donor milk required and the volume wasted. Total volume intakes per day as well as numbers of bottles (100ml) opened were reviewed. Millilitres wasted per bottle were calculated, and compared against projected waste in the case of substitution to 50ml bottles. Finally, the cost difference between currently used 100ml bottles and 50ml bottles was determined.

Results

The mean wastage of DBM per baby was 468.16ml. This translated to a cost of £257.49 of wasted DBM per baby. It was calculated that if DBM was provided in 50ml bottles, this cost and wastage could be halved, reducing excess to 229.28ml per baby. If this pattern were to continue on a larger scale, using figures from 2020, approx. £11,759.02 per year could be saved.

Conclusion

This study suggests that switching DBM from 100ml to 50ml bottles would reduce wastage of this precious resource, NICU costs and possibly allow DBM be provided to a larger number of infants.

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IMPACT OF BLOOD TRANSFUSION ON CEREBRAL AND SOMATIC TISSUE OXYGENATION IN PREMATURE INFANTS WITH AND WITHOUT A PATENT DUCTUS ARTERIOSUS

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Aims: The impact of packed red blood cell (PRBC) transfusions on left ventricular (LV) afterload and pulmonary vascular resistance (PVR), cerebral and somatic regional tissue oxygenation (rSO2) in the context of a patent ductus arteriosus (PDA) warrants further investigation.

Methods: Infants <32 weeks gestation who received a PRBC transfusion beyond the first 10 days of life were included. 24 hour assessment of cerebral and somatic rSO2 and fractional tissue oxygen extraction (FTOE) commenced at the start of the transfusion. Echocardiography was carried out at: baseline, 18 hours and 24 hours post transfusion.

Results: Thirty infants with a median [IQR] gestation and birthweight of 26.3 [24.8 – 28.0] weeks and 855 [659 – 1103] grams were included. Baseline haemoglobin was 10.0 [9.3 – 10.5] g/dL. Pulmonary artery acceleration time increased (48 ± 13 to 57 ± 16 ms, $p<0.01$) from baseline to 24 hours post transfusion. LV ESWS did not change (378 ± 149 to 361 ± 132 dynes/cm2, $p=0.67$). There was no change in LV or RV strain over the study period ($p>0.05$). Ten infants had a PDA (median diameter 2.1 [1.8 – 2.7] mm). Cerebral rSO2 increased in a similar manner in infants with and without a PDA following PRBC transfusion with a corresponding fall in cerebral FTOE. Although somatic rSO2 increased during the study period in the overall group, the rSO2 values were significantly lower in those with an open PDA at baseline and following transfusion compared to those with a closed PDA. There was a significant decrease in somatic FTOE following transfusion in the closed PDA group only.

Conclusion: PRBC transfusion results in a fall in PVR without significant change in myocardial function or LV afterload. Cerebral oxygenation improved following transfusion regardless of PDA status. Somatic oxygenation improved to a greater extent in babies with a closed PDA.

ASSESSMENT OF CARDIAC FUNCTION IN INFANTS WITH DOWN SYNDROME OVER THE FIRST TWO YEARS OF AGE USING NOVEL ECHOCARDIOGRAPHY TECHNIQUES

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Aim: There is a dearth of longitudinal data describing the evolution of cardiopulmonary haemodynamics in infants with Down Syndrome (DS) beyond infancy. The objective of this study was to serially assess pulmonary hemodynamics and myocardial function in infants with DS over the first two years of age.

Methods: A prospective observational cohort study carried out in three tertiary neonatal intensive care units in Dublin. Infants with DS with and without CHD and controls underwent serial echocardiograms at birth, 6 months, 1 year and 2 years of age to assess pulmonary vascular resistance (PVR) and biventricular function using advanced echocardiography techniques.

Results: Seventy infants with DS (48 with CHD and 22 without CHD) were compared to 60 controls. The DS cohort had a lower gestation (37.7 ± 2.1 vs. 39.6 ± 1.2 weeks, $p<0.01$) and birth weight (3.02 ± 0.68 vs. 3.56 ± 0.42 Kg, $p<0.01$). Infants with DS exhibited shorter left ventricular (LV) and right ventricular (RV) lengths and lower LV and RV systolic function over the two year period. LV diastolic function was lower in infants with DS beyond Day 2. PVR was higher in the DS group throughout the study period. A diagnosis of DS was an independent significant predictor of all the described measurements at 2 years, independent of CHD status and gestation at birth (all $p<0.05$).

Conclusion: To the best of our knowledge, this study is the largest prospective study evaluating longitudinal myocardial function and pulmonary haemodynamics in infants with DS from birth to two years of age. Our results demonstrate sustained abnormal elevation of pulmonary pressures and impaired systolic and diastolic function in infants with DS over the first two years of age irrespective of structural cardiac disease. This data may encourage clinicians to improve cardiovascular monitoring and proactive management strategies for infants with DS.

BORN INTO HOMELESSNESS: A RETROSPECTIVE REVIEW OF THE ANTENATAL COURSE AND NEONATAL OUTCOMES OF INFANTS BORN TO HOMELESS MOTHERS

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Aims: Homeless women and their babies often suffer from an intersection of social determinants of health including poverty, language and cultural barriers. A 2019 position paper from the College of Paediatrics and the College of Public Health identified homelessness as a significant threat to the health and wellbeing of Irish children, and called for further research into its impact. We set out to establish how the antenatal and neonatal course of infants born to homeless mothers differs from the general population delivering at the Rotunda.

Methods: All homeless women who liaised with the Medical Social Worker Department and subsequently delivered liveborn infants in the Rotunda in the calendar year 2020 were included. Homelessness was defined as either A. A designated homeless accommodation service was listed as their address; or B. Self-identified as homeless with an address other than homeless accommodation. Maternal and Infant records were reviewed, and compared with hospital wide data as a control.

Results: A total population of 145 infants born to 143 mothers were included. Compared with hospital wide data infants born into homelessness had higher rates of prematurity (13.79% vs 6.78%, $p<0.01$), a lower median birth weight (3.19kg vs 3.41kg) and higher rates of admission to the neonatal unit (35.17% vs 15.46%, $p<0.01$). Following discharge, infants born into homelessness were associated with higher incidence of missed appointments at the neonatal clinic (28.26% vs 15%), higher rates of any Formula Feeding (64% vs 36%) and lower rates of exclusive Breastfeeding (16% vs 45%).

Conclusions:
Addressing societal inequalities starts before birth. Infants born into homelessness are a particularly vulnerable group, as they are associated with a greater incidence of prematurity, lower birth weight, less exclusive breastfeeding and poor attendance to outpatient appointments.

NASAL HIGH FLOW TO OPTIMISE STABILITY DURING INTUBATION IN NEONATES: RESULTS OF THE NOSI PILOT TRIAL

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Background: Adult studies of patients with acute respiratory failure requiring intubation, have demonstrated that high-flow heated and humidified oxygen via nasal cannulae (HFNC) during intubation reduces oxygen desaturation. We hypothesised that in neonates requiring intubation the use of HFNC at 6L/min and FiO2 of 1 would decrease the duration of hypoxia.

Methods: Population: All babies requiring intubation in the neonatal unit. Randomised controlled two-arm trial. Premedication with fentanyl, atropine and suxamethonium. Real time second by second data retrieved from clinical monitor. Intervention: pre-oxygenation/ventilation with Neopuff Infant Resuscitator device followed by HFNC 6L/min, FiO2=1, during laryngoscopy. Control:pre-oxygenation /ventilation with Neopuff then HFNC applied with zero flow. Primary outcome: cumulative duration of hypoxaemia <75% up to successful intubation. Study blinded to data collector/analyst. Simultaneous running of suction adjacent to baby blinded intubators to allocation. Secondary outcome variables included total duration of attempt, rate of desaturation and number of attempts. Mann Whitney U test used for analysis of primary outcome.

Results: 34 babies enrolled ; 20 preterm <34 weeks gestation, 14 ≥34weeks. Within the preterm cohort median cumulative time <75% oxygen was 32s vs 39s, intervention vs control, p=0.99. In the group> 34 weeks median was 4.5s in the control group and zero seconds in intervention. Total duration of larynoscopywas 120s in the intervention group versus 81s in control (p=0.06) for <34 weeks. Rate of desaturation was slower in the intervention arm (3.7% per 10s) vs control (4.2% in 10s) p<0.01. Babies showed increased instability in control group following attempts lasting >1 minute.

Conclusion: We demonstrated that HFNC reduces rates of desaturation but was associated with longer overall attempts. Although this pilot study did not detect a significant difference in time below 75% the trial has provided baseline data to inform further structuring and sizing of a further larger trial.

A PROPSECTIVE OBSERVATIONAL STUDY OF HOW COVID-19 HAS AFFECTED PAEDIATRIC ACCESS TO HEALTHCARE IN ACUTE ILLNESS

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Aims: Since the beginning of the COVID-19 pandemic, anecdotally patients have reported difficulty accessing GP services for several reasons, including infective symptoms and excess demand. The aim of our study was to assess contact with GPs prior to presentation to the ED.

Methods: A prospective observational study carried out in the Paediatric ED in University Hospital Galway over a four-week period. An anonymous questionnaire was created and distributed to parents of children attending the ED.

Results: A total of 148 questionnaires were completed. 81% contacted a GP prior to arrival in the ED. Of those who contacted a GP, 51 patients (42%) had an in-person consultation and were referred into the ED for assessment. 45 patients (38%) had a virtual consultation and were referred into ED for assessment, with 25 of those patients being referred without a referral letter. 20% of those who contacted a GP were told they could not be assessed due to having covid symptoms or due to no appointment available. 19% did not contact a GP prior to attending the ED and this was largely due to it being an emergency situation (23 patients) and 5 patients said they were unable to contact GP services despite trying to.

Conclusion: The majority of the patients sought access to a GP prior to attending the ED. Of these, many were assessed virtually or not at all. Changing practice in primary care services has impacted on presentations to our ED. Increased resources are required to cope with the extra patient demand but not available in the public healthcare system. Strategies for children to access primary care in a timely fashion must be developed in the era of COVID-19.

Penicillin Challenge in Low risk (PENCIL Study): A nurse-led penicillin delabelling clinic for low probability paediatric penicillin allergy

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Background:
Penicillin allergy (PenA) is reported in approximately 10% of paediatric populations. However, more than 90% of children who undergo challenge are tolerant. PenA is associated with significant morbidity, mortality, and impacts on antimicrobial resistance and healthcare costs. The burden of unverified PenA requires novel delabelling protocols including all members of the multi-disciplinary team to be developed for use outside of tertiary centres.

Objective:
This study aimed to demonstrate that a nurse-led penicillin delabelling clinic in a secondary referral centre for children who are stratified as low probability for true PenA is efficacious, safe, and acceptable to parents.

Methods:
Parents of children with a label of PenA completed a nurse triaged risk stratification questionnaire. If eligible, participants were invited to attend a single dose direct penicillin drug provocation test. Parents were contacted 24 hours following challenge to assess for delayed reactions. A follow up questionnaire was completed rating parental satisfaction and confidence in the delabelling process.

Results:
Of those with a label of PenA, 88% were identified as low probability and eligible for attendance at the nurse led clinic. Of those eligible, 71% attended for a challenge and of those challenged 96% had a negative challenge. There were no immediate reactions noted and one child had a suspected delayed hypersensitivity reaction. The clinic was highly acceptable to parents and a high level of confidence in further penicillin use was reported at follow up.

Conclusion:
To our knowledge, this is the first study showing a nurse-led protocolised delabelling clinic for low probability paediatric PenA is efficacious and safe. This protocol requires no rostered clinician presence or additional resources and is generalisable to non-tertiary centres with an Allergy Clinical Nurse Specialists. Importantly, the protocol was highly acceptable to parents which may encourage future penicillin use following negative challenge.

Validating clinical practice guidelines for the management of febrile infants in UK and Ireland

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Introduction: Young febrile infants (≤ 90 days) are at higher risk of serious and invasive bacterial infections (SBI & ISI). Approximately 10-20% either have meningitis, bacteremia or UTI & correct identification is truly challenging. There are numerous validated CPGs but NICE NG51, NICE NG143 and the British society for antimicrobial chemotherapy (BSAC)are the ones widely used in UK & Ireland.

The aim of this study was to report the performance and predictive capacity of these CPGs in identifying SBI/IBI in infants under 3 months of age presenting with fever in emergency departments (EDs) in UK and Ireland.It is the largest UK and Irish study of febrile infants presenting to EDs to date.

Method: This is a multicenter retrospective observational study conducted amongst six paediatric EDs in UK and Ireland selected from PERUKI network and all these paediatric centers had combined annual ED census of 39,000 children. Data was submitted into a secure centralized database. All participants were age ≤ 90 days who presented to ED between 31/08/2018 to 01/09/2019 with febrile illness.

Results: Out of 1942 initially screened participants,555 were included for final analysis. The median age was 53 days(IQR 32-70,range 1-90).Confirmed SBI/IBI were 78(14%)of the analyzed population.66 participants (12%)had a urinary tract infection(UTI),7(1%)had bacteremia and 5(1%)had bacterial meningitis. The NG51 CPG "Sepsis: recognition, diagnosis and early management" demonstrated the greatest sensitivity1.00(95% CI 0.95 to 1.00) in comparison NICE NG143 0.91(95%CI 0.82 to 0.96, p=0.0233) and BSAC 0.82(CI 0.72 to 0.90, p=0.0005). None required ICU& all survived.No cases of confirmed SBI/IBI in well appearing infant presenting within 24 hours of vaccination.

Conclusion: In UK and Ireland,14% of the febrile infant aged under 90 days presenting to ED had an underlying serious bacterial infection. None of assessed CPGs exhibited good performance characteristics. There are areas for improvement to avoid unnecessary and unpleasant investigations and guidance for initial clinical-decision making.

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NON-INVASIVE VENTILATION IN A PAEDIATRIC DOWN SYNDROME POPULATION: DELIVERY AND COMPLIANCE

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Aims: Children with Down syndrome (DS) have an increased prevalence of obstructive sleep apnoea (OSA) and due to their significant co-morbidities they are more at risk of the negative sequelae of un/undertreated OSA. Non-invasive ventilation (NIV) is a common treatment modality of OSA, however its success relies on compliance and effective intra-alveolar delivery of positive pressure. To date, there is a paucity of data within the literature discussing adherence and efficacy of domiciliary NIV within the paediatric DS population, of these studies there are conflicting reports, cohort numbers are inadequate and without the presence of a control group these studies rely on an arbitrary measure of adequate adherence.

Methods: This was a retrospective cohort study involving 106 children with confirmed OSA and home NIV with downloadable data capacity. Children were divided into DS (n=44) and non-DS cohorts (n=62). Adherence, apnoea-hypopnoea index (AHI), positive airway pressure delivery and leakage were recorded and compared between DS and non-DS cohorts and within the DS cohort based on past surgical history and OSA severity.

Results:
Significantly greater NIV usage was observed in the DS cohort, they showed more consistent use with an increased percentage of days used relative to their non-DS counterparts (p=0.031). However, despite greater usage, poorer clinical outcomes in the form of increased AHI (p=0.0493) were observed in the DS cohort, where significantly greater leakage was also shown (p=0.022). Twenty children with DS had prior cardiac surgery; compliance across all parameters was significantly reduced relative to those without.

Conclusion: These dataconfirm that satisfactory NIV adherence is achievable in children with DS. However, we have identified excessive system leak at the machine-patient interface as a factor, which could undermine NIV efficacy in children with DS. A solution could form as 3D-printing technologies and the age of personalised medicine come to the fore.

THE PAEDIATRIC OUTPATIENT EXPERIENCE IN THE COVID 19 ERA.

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Aims

Paediatric outpatient visits, by necessity, have been modified by the Covid 19 pandemic. This study aimed to evaluate the current experience of parents at the outpatient visit and also to evaluate their experiences of virtual clinics over the past year.

Methods

Parents of children attending review outpatient paediatric clinics at Mayo University Hospital completed prospective anonymous voluntary surveys over a 5-week period.
Data including child's age, diagnosis and duration attending clinic was recorded. Parent values and perceived experience of in-person and virtual clinics were assessed using binary (yes/no) and Likert scoring system questions; cuing at 1 "not at all" and at 6 "definitely". Mean Likert and positively skewed Likert 5/6 were calculated.

Results

Two hundred and twenty-six parents (92%) completed surveys. Children ages were 26(11%) 0-1years, 64(28%) 1-5years, 69(31%) 6-10years, 67(30%) >10years. One hundred and forty-eight (66%) attended general clinic. Specialised clinics included complex-care(n=8), cystic fibrosis(n=3), asthma(n=33), diabetes(n=21), trisomy 21(n=10). Mean duration attending services was 3.17 years.

Parents prioritised timeliness, rapport and investigations with mean Likert scores 4.4, 5.4 and 5.0 respectively. Perceived in-person attendance difficulties included; missing work 74(33%), school loss 151(67%), childminding requirements 66(29%) and excessive waiting 43(19%).

Seventy-five parents (33%) experienced virtual clinics and for fifty-four (74%) it was sufficient. Thirty-four (47%) agreed virtual clinics were as good as in-person clinics. Forty-four (64%) reported 'less hassles with virtual clinics'. Advantages included timeliness, reduced covid risk, need for childcare and travel.

Disadvantages included lack of communication, physical examination and investigations. Forty-two (57%) preferred in-person combined with virtual clinics. Thirty (41%) preferred in-person alone. Two (3%) preferred virtual clinics alone. Nineteen (25%) were satisfied with virtual clinics compared to fifty-one (68%) with in-person clinics ($p<0.001$, Fisher's exact test).

Conclusion

While, for parents, the traditional outpatient visit is satisfactory, specific training in conducting virtual clinics is required for doctors.

THE INCIDENCE AND CHARACTERISTICS OF INPATIENT CHILD PROTECTION CONCERN CASES DURING THE COVID-19 LOCKDOWN

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Aims:
Known risk factors for child maltreatment including parental unemployment and domestic violence [1, 2] were compounded by social isolation from school closures and home visitation restrictions during the COVID-19 lockdown. Research on child maltreatment during the pandemic is limited.
Our study aims to compare the incidence of and to characterize the types of child protection concerns among inpatients during the 2020 lockdown versus 2019.

Methods:
We performed a retrospective chart review of inpatients with child protection concerns at Children's Health Ireland at Crumlin and Tallaght during the March 13 to August 31 2020 lockdown and the same timeframe in 2019.

Results:
There were 86 inpatients with child protection concerns in 2020 versus 163 in 2019. Total admissions were 4609 in 2020 and 7728 in 2019. Inpatients with child protection concerns accounted for a smaller percentage in 2020 (1.8% versus 2.1% in 2019 (p=0.35)).
In 2020, there was a greater percentage of physical abuse concerns (52.3% versus 11% in 2019 (p<.001)) and emotional abuse concerns (6.9% versus 1.2% in 2019 (p=0.014)). No statistically significant differences were observed for neglect, sexual abuse or welfare concerns. The cases in 2020 were more complex with 48.8% involving more than one concern type per case versus 13.4% in 2019 (p<.001).
Child protection concerns increased steadily during the lockdown, peaking in July. Among the 2020 cases, there were more unwitnessed injuries (34.8% versus 17.7% in 2019 (p=.002)) and physical disciplining by parents (6.9% versus 0.6% in 2019 (p=.003)). No statistically significant differences were observed in delayed presentation or domestic violence.

Conclusions:
While fewer inpatients were assessed for child protection concerns during the 2020 lockdown versus 2019, the 2020 cases were more complex. An increase in physical and emotional abuse concerns, unwitnessed injuries and physical disciplining highlights child protection issues specific to the pandemic.
References: 1. Lawson M, Piel MH, Simon M. Child Maltreatment during the COVID-19 Pandemic: Consequences of Parental Job Loss on Psychological and Physical Abuse Towards Children. Child Abuse & Neglect 110 (2020) 104708. 2. Australian Law Reform Commission. Interconnectedness of Family Violence and Child Abuse. Brisbane: Australian Government; 2010.

POSTNATAL MATERNAL MENTAL HEALTH AND POSTNATAL ATTACHMENT

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Aims:
Maternal mental illness has a significant influence on negative maternal and childhood outcomes. Few studies have focused on both maternal depression and anxiety, or explored the interplay of maternal mental illness and the mother-infant bond. We aimed to examine the relationship between early postnatal attachment and mental illness at 4 and 18 months postpartum.

Methods:
This was a secondary analysis of 168 mothers, recruited from the BabySmart study. All women delivered healthy term infants. Depression and anxiety symptoms were measured via the Edinburgh Postnatal Depression Scale (EPDS) and Beck's Depression and Anxiety Inventory at four and eighteen months respectively. Maternal Postnatal Attachment Scale (MPAS) was completed at 4 months. Negative binomial regression analysis investigated associated risk factors at both time-points.

Results:
The prevalence of postpartum depression fell from 12.5% at four months to 10.7% at eighteen months. Anxiety rates increased from 13.1% to 17.9% at similar time points. At eighteen months, both symptoms were new in almost two-thirds; 61.1% and 73.3% respectively. There was a strong correlation between the anxiety scale of the EPDS and the total EPDS p-score (R=0.887, <0.001). Early post-partum anxiety was an independent risk factor for later anxiety and depression. High attachment scores were an independent protective factor for depression at 4 months *(RR=.943, 95%CI: .924-.962, p<.001)* and 18 months *(RR=.971, 95%CI:.949-.997, p=.026),* and protected against early postpartum anxiety *(RR=.952, 95%CI:.933-.97, p<.001).*

Conclusion:
The prevalence of postnatal depression at four months was similar to national and international rates though clinical anxiety increased over time with almost 1 in 5 women scoring in the clinical anxiety range at 18 months. Strong maternal attachment was associated with decreased reported symptoms of both depression and anxiety. The effect of persistent maternal anxiety on maternal and infant health needs to be determined.

AN AUDIT OF GREEN INHALER PRESCRIBING IN A TERTIARY PAEDIATRIC RESPIRATORY CENTRE

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Aim:
Metered-dose inhalers (MDI) contribute significantly to the carbon footprint of healthcare systems.(1) Scandinavian countries have lower rates of MDI prescribing relative to dry powder inhalers (DPI).(2) This audit was designed to estimate the relative proportion of MDI to non-MDI use as well as the clinical candidacy of each patient to switch to non-MDI amongst a paediatric asthma population.

Methods:
The inhaler prescriptions of consecutive patients attending a tertiary paediatric respiratory centre between 5th May and 29th September 2021 were audited. An audit tool was created to collect the relevant information from outpatient clinic letters. Inclusion criteria were children aged 6 to 16 years on inhaled therapy for asthma. An overview of asthma control was estimated using a brief questionnaire based on GINA guidelines. Inhalers were categorised based on their global warming potential (GWP).(1) Published international rates of MDI prescribing were used as standard of care (10-30%).

Results:
86 eligible patients attended the asthma clinic within the audit time period, 36% female, median age 9 (range, 6-16) years. This cohort had been prescribed a total of 160 inhalers, of which 147 (92%) were moderate or high GWP. By inhaler sub-type, 99% of the 79 short-acting bronchodilators prescribed, 96% of the 47 inhaled corticosteroids (ICS) prescribed, and 71% of the 34 combination ICS/long-acting beta agonists prescribed were MDI and of moderate or high GWP. 78 (91%) individual patients were taking MDI as part of their asthma treatment regimen, of whom 64 (82%) were deemed to have well-controlled asthma.

Conclusions:
In a cohort of patients attending a tertiary paediatric centre with asthma, the vast majority were using MDI rather than non-MDI alternatives. Moreover, a significant proportion are likely to be candidates for a greener inhaler by clinical criteria. A stronger emphasis on green inhaler prescribing is needed to match international standards.

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THE ASSOCIATION OF BREASTFEEDING AND ALLERGIC DISEASE AT AGE NINE IN IRELAND; THE GROWING UP IN IRELAND INFANT COHORT STUDY

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Aims: Despite well-recognised benefits, Irish breastfeeding rates remain suboptimal[1]. This prospective cohort study investigated associations between breastfeeding and allergic diseases at age nine in Irish children.

Methods: Waves 1 and 5 of the Growing Up in Ireland Infant Cohort Study provided this study's cohort follow-up. Mothers self-reported infant feeding practices at nine months and allergic disease outcomes when children were nine years. Multiple logistic regression was used to generate adjusted odds ratios (adjOR) for associations between breastfeeding and allergic diseases. Re-weighting was applied to improve generalisibility.

Results: Of the 72% (N=8,006) of mothers who responded to both waves, 53% had ever-breastfed their child; younger mothers, smokers and mothers of lower socioeconomic status were significantly less likely to ever-breastfeed. Compared to never-breastfeeding, ever-breastfeeding was protective against asthma (adjOR 0.74, 95% Confidence Interval (CI) 0.62-0.87), atopic dermatitis (adjOR 0.72, 95%CI 0.55-0.93) and any allergic disease at age nine (adjOR 0.87, 95%CI 0.76-0.997). Ever-breastfeeding increased the risk of allergic rhinitis (adjOR 1.44, 95%CI 1.07-1.94); the association with food allergy was inconclusive (adjOR 1.17, 95%CI 0.83-1.64). Breastfeeding ≥6 months was protective against asthma (adjOR 0.57, 95%CI 0.39-0.82) and any allergic disease (adjOR 0.72, 95%CI 0.55-0.96). Exclusive breastfeeding (3-5 months) was protective against asthma (adjOR 0.67, 95%CI 0.50-0.89) and atopic dermatitis (adjOR 0.54, 95%CI 0.34-0.86).

Conclusions: Although associations between breastfeeding and asthma and atopic dermatitis are well-researched in younger children, evidence for continued effect in older children is sparse[2]. This study provides new evidence suggesting breastfeeding may be protective against asthma and atopic dermatitis but may increase the risk of atopic rhinitis in older children, warranting further research. Results must be considered in light of high Irish allergic disease prevalence. Breastfeeding conveys significant child health benefits; community and hospital-based health promotion campaigns in support of breastfeeding prior to and following birth should be prioritised accordingly.

1.Lubold, AM. Historical-qualitative analysis of breastfeeding trends in three OECD countries. Int Breastfeed J. 2019; 14:36. 2.Güngör D, Nadaud P, LaPergola CC, Dreibelbis C, Wong YP, Terry N et al. Infant milk-feeding practices and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span: a systematic review. Am J Clin Nutr. 2019; 109 Suppl 7:S772-S799.

A RETROSPECTIVE REVIEW OF EMERGENCY DEPARTMENT UTILISATION BY HOMELESS CHILDREN IN DUBLIN

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Introduction
From 2014-2021 a 171% increase in newly homeless families was observed, resulting in a 211% increase in child homelessness. In June 2021, there were 932 families registered as homeless, with children comprising 27% of the Irish homeless population. Family homelessness is underestimated as government statistics exclude those in direct provision, couch-surfing and women's refuges.

We aimed to compare emergency department presentations between homeless and non-homeless children.

Methods
A retrospective review of homeless children attending a tertiary Paediatric Emergency Department in Dublin from 01/01/2017-31/12/2020 was performed. Comparison was made with 1,500 random non-homeless attendances in 2019. We defined homelessness as those with addresses of no fixed abode, government homeless accommodation, direct provision, women's refuges, drug rehabilitation centres and children's residential homes. Outcome measures included demographics, vaccination status, medical acuity, diagnoses and discharge outcomes.

Results
Of 197437 attendances, 3138 (1.59%) were homeless. Compared to the non homeless cohort, homeless children were less likely to be Irish (37.4% vs 74.6%, $p<0.001$), or have been born in Ireland (82.3% vs 96.2%, $p<0.001$). Irish Traveller (89.4% vs 10.6%), Roma (95.5% vs 4.5%) and Black (91.8% vs 8.2%) ethnicities were over-represented ($p<0.001$).

Homeless children were younger (age under 12 months: 26% vs 16%, $p<0.001$), and less likely to be fully vaccinated (73.6% vs 81.9%, $p<0.001$) or have registered GPs (89.7% vs 95.8%, $p<0.001$). They were more likely to have ≥4 attendances in 6 months (9.7% vs 5.4%, $p<0.001$), re-present within two weeks (15.9% vs 10.5%, $p<0.001$), and use ambulance transportation (13.2% vs 6.7%, $p<0.001$). Homeless children had lower acuity presentations (triage category 4-5: 47.2% vs 40.7%, $p<0.001$) and less admissions (5.9% vs 8.4%, $p<0.001$) than non-homeless children.

Conclusion
Irish Traveller, Roma and Black ethnicities were over-represented in homelessness. Despite lower acuity presentations, homeless children had increased emergency service utilisation, and were less likely to engage with primary healthcare than non-homeless children.

Chronic nonbacterial osteomyelitis is associated with HLA B27 in the Irish population

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Introduction

Chronic nonbacterial osteomyelitis (CNO) is an auto-inflammatory condition affecting children with estimated prevalence of $1/10^5$ - 10^6. It is characterized by relapsing episodes of localised bone inflammation. Extraosseous manifestations frequently occur, particularly psoriasis, enthesitis-related arthritis, Crohns disease. No increased frequency of HLA class I alleles associated with these diseases, eg HLA B27, has been shown in patients with CNO.

Aim

To determine HLA class I allele frequency in an Irish cohort of patients with CNO compared to Irish population frequencies.

Methods

40 unrelated Irish children and adolescents with CNO were recruited. Whole exome sequencing (WES) was performed on blood using Illumina HiSeq 3000 with 150bp paired-end reads. Variant calling followed GATK best practice guidelines. HLA alleles were predicted from WES results using Optitype software through the Nextflow nf-core/hlatyping pipeline (version 1.1.5). Statistical analysis against Irish population frequencies was performed in RStudio (version 1.1.456).

Results

WES and HLA allele prediction was performed on 40 unrelated patients. All were ethnically Irish; female:male ratio of 2.9:1; 88% had multifocal disease; 51% required second-line treatment. Psoriasis was present in 18.6% of patients and a further 18.6% of $1^{st}/2^{nd}$ degree relatives. HLA class I prediction was successful in all. HLA-B*27:05 was present in 17.5% of patients compared to 6% of the general population (OR 3.28, 95%CI 1.18 – 7.8, p=0.011). Patients carrying HLA-B*27:05 allele did not have more frequent co-morbidity with HLA-B*27 associated diseases than the overall cohort. HLA-C*06:02 was present in 27.5% of patients compared to 17.5% (OR 1.96, 95% CI p=0.13). A personal/family history of psoriasis was not more frequent in patients carrying HLA-C*06:02. All other alleles were found at frequencies close to the Irish population frequency.

Conclusions

There is a statistically significant association between CNO and HLA-B*27:05 in the Irish population. Results need to be replicated in a larger cohort for further stratifcation to be possible.

Presentation Time: 14.20-14.30
Sub-Specialty

The impact of multi-disciplinary input on glycaemic control in children on intensive insulin therapy using real world prospectively collected data

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Aims: To investigate the factors impacting on glycaemic control over time including treatment type, educational input and patient demographics within an Irish tertiary paediatric diabetes centre.

Methods: Using a prospectively maintained database of clinical encounters, data was analysed in age matched pairs from 2007 to 2020. Pairs were matched by insulin treatment type (pump v multiple daily injection (MDI)). Matching was performed on the basis of sex, current age, age at diagnosis and HbA1c at pump commencement. Panel data regression was performed on the entire sample and analysed for the impact of differing insulin regimens by gender, age and duration of diagnosis. This model was then used to assess the impact of intensive re-education sessions on HbA1c.

Results: From 1,376 patients there were 112 matched pairs. Compared to MDI, matched pump patients had a lower HbA1c 6 months after commencement [Difference in HbA1c = 0.53% p <0.01], this effect persisted to 8 years [0.52% p=0.04]. Panel data analysis showed CSII therapy reduces HbA1c by 0.58% relative to MDI therapy (p<0.001). Patients who required intensive re-education showed a HbA1c 0.94% greater than otherwise identical patients prior to re-education, after these sessions HbA1c drops by a statistically significant 0.79% (p<0.001) to 0.14% greater than their peers.

Conclusions: Compared to matched peers on MDI treatment regimens, patients on pump therapy showed significant improvements in HbA1c which was an effect sustained up to 8 years. Panel data regression confirms these findings and in addition shows that intensive re-education is associated with a significant drop in previously elevated HbA1c levels.

MAPPING THE IMPACT OF COVID-19 ON PAEDIATRIC SERVICES AND NATIONAL HEALTHCARE ACTIVITY: A SECONDARY ANALYSIS OF PUBLICLY AVAILABLE DATA

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Aims: Sláintecare aims to introduce universal healthcare in Ireland. The COVID-19 pandemic poses challenges to this process, particularly the aspiration of improved access to healthcare. We studied the impact of the first year of COVID-19 across Irish healthcare, including on paediatric services.[1]

Methods: Secondary analysis was undertaken on publicly-available data on three key domains of the healthcare system: community-based healthcare, including eight allied healthcare specialties and developmental screening checks delivered by public health nurses (PHNs); primary care, namely out-of-hours general practitioner (OOH GP) attendance; and hospital waiting lists.

Results: *(i) Community Healthcare.* Throughout 2018 and 2019, the proportion of children receiving a 10-month screening check from a PHN on time was consistently 90-94%; this declined sharply during 2020, reaching a nadir of 25.5% in May 2020. For allied healthcare, the numbers of patients seen across eight specialties fell 35.1% versus previous years. Large activity reductions were reported in speech and language therapy (49.0%), audiology (46.1%) and physiotherapy (33.7%). Age-disaggregated data were unavailable; however, children are known to rely heavily on allied healthcare services. *(ii) Primary Care.* The number of patients accessing OOH GP care fell 37.3% in April 2020 versus 2019. This decline was sustained until August 2020, when activity recovered. Paediatric-specific disaggregated data for primary care are unavailable; however, others have suggested children appear to utilise this service disproportionately.[2] *(iii) Hospitals.* National hospital waiting lists increased from 729,937 to 908,519 (24.5%) from January 2019 to August 2021. In August 2021, 85,950 children were on a waiting list for a first outpatient appointment, 29,273 (34.1%) of whom for longer than 18 months.

Conclusions: Paediatric services have been significantly disrupted by COVID-19 – as with all areas of the Irish system – producing increased wait times and worsened healthcare access across several domains. The deferred health and developmental impacts of this trend warrant research and policy attention.

1. McGlacken-Byrne D, Parker S, Burke S. Tracking aspects of healthcare activity during the first nine months of COVID-19 in Ireland: a secondary analysis of publicly available data. Published online September 2, 2021. doi:10.12688/hrbopenres.13372.1 2. O'Callaghan ME, Zgaga L, O'Ciardha D, O'Dowd T. Free Children's Visits and General Practice Attendance. Ann Fam Med. 2018;16(3):246-249. doi:10.1370/afm.2229

Presentation Time: 14.40-14.50
Sub-Specialty

A SUMMARY OF COVID-19 RELATED ADMISSIONS TO PAEDIATRIC INTENSIVE CARE IN IRELAND

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AIM: To establish the number of admissions (and associated severity of illness) in children <16 years to Paediatric Intensive Care in Ireland between January 2020 and October 2021 with an admitting diagnosis of COVID-19 +/- Paediatric Multisystem Inflammatory Syndrome (PIM-TS) +/- related myocarditis. To further examine these admissions for the following:

1. Demographics including: age; ethnicity.
2. Presence of comorbidities, including BMI.
3. Intervention(s) required, including: ventilation; inotropes; steroids; immunoglobulins.
4. Length of Stay (PICU and Ward-Level); and, discharge status from PICU.

METHOD: Case review of a standarised data set from Paediatric ICU Audit Network (PICANet) and IntelliSpace Critical Care and Anesthesia (ICCA) of all children admitted with the aforementioned diagnosis to the Paediatric Intensive Care Units at CHI (Crumlin and Temple Street) during the dates outlined.

RESULTS: There were a total of 33 COVID-19 related admissions to PICU over the 21 months between January 2020 and October 2021. This represents 205 of approximately 10000 PICU bed days provided annually (1%). 33% required mechanical ventilation. 54% required inotropic support. All patients underwent cardiac ECHO; and, 75% had evidence of acute myocarditis at time of admission. A formal review of ECHO findings is on-going (including those in the 12-16 year age group, post vaccination).

CONCLUSION:
COVID-19 critical illness in children, as described above, represents approx. <0.1% of children in Ireland and approx. 1.3% of PICU admissions over this period. The majority of children (<16) in Ireland, during the past 21 months, have not required PICU level care for COVID-19 and related illness; and, of those who did, all survived.

With thanks to Ms. E. Brereton, PICU Data Manager at CHI Crumlin, for her invaluable assistance.

LYMPHOCYTE, NEUTROPHIL AND MONOCYTE FUNCTION AND CYTOKINE RESPONSES IN CHILDREN WITH SEVERE NEUROLOGICAL IMPAIRMENT: EFFECT OF LIPOPOLYSACCHARIDE

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[4]Department of Neonatology, Children's Health Ireland at Crumlin, Dublin, Ireland
[5]Department of Neonatology, The Coombe Women and Infants University Hospital, Dublin, Ireland

Aims
Children with Severe Neurological Impairment (SNI) have permanent disorders of the central nervous system resulting in motor impairment, cognitive impairment, and medical complexity. Infection related morbidity and mortality is higher in children with neurodevelopmental disorders. We aimed to evaluate the effects of lipopolysaccharide (LPS) on lymphocytes, neutrophils, monocytes, and cytokines in children with SNI compared to age and sex-matched controls.

Methods
Whole blood samples were incubated in the presence or absence of lipopolysaccharide (10ng/ml). Cytokines were analysed by ELISA from isolated serum. Neutrophils (CD66b+), monocyte subsets (based on degree of CD14 and CD16 positivity), B cells (CD3-/CD19+), NK cells (CD3-/CD56+), and T cells (CD3+) were analysed by flow cytometry. TLR-4, CD66b and CD11b are proteins involved in immune cell activation, migration, and adhesion, and were used as markers of activation.

Results
Children with SNI and age-matched controls (n=14 each) participated. Total T cells, CD8+ T cells, and monocytes were lower at baseline in children with SNI (p=0.02, p=0.0031 & p=0.0002 respectively). CD66b hyporesponsiveness to LPS was seen in the SNI cohort (p=0.0017). TLR-4 expression in total and classical monocytes was hyper-responsive to LPS in children with SNI (p=0.04 & p=0.03 respectively). GM-CSF increased in the control group (p=0.04) but not in the group of children with SNI (p=0.07), indicating hyporesponsiveness to LPS in the latter. Interleukin-6 in the SNI cohort was also relatively hyporesponsive to LPS (p=0.012). The SNI cohort had a relatively larger increase in erythropoietin in response to LPS than the comparison group (p=0.0068).

Conclusion
We have demonstrated significant differences in immune regulation in children with SNI. These findings may partially explain increased infection-related morbidity and mortality, and tertiary neurological injury in this population, providing a potential therapeutic target. Future prospective longitudinal studies which correlate these differences with health-related outcomes are required.

ASSESSING CHANGES IN THE UPPER AIRWAY USING 3-DIMENSIONAL SEGMENTATION AFTER CRANIOFACIAL DISTRACTION SURGERY IN CHILDREN WITH SYNDROMIC CRANIOFACIAL ANOMALIES

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Aims: Craniofacial deformities are associated with functional morbidities, such as airway obstruction. Primary management involves fronto-facial distraction surgery, intending to normalise facial appearance as well as treating cephalocranial disproportion, exorbitism, and anatomical airway compromise. This study aims to demonstrate significant airway differences resulting from fronto-facial distraction in paediatric patients with syndromic craniosynostosis using 3D technology.
Methods: 24 paediatric patients with syndromic craniosynostosis who underwent fronto-facial surgery between 2015 to 2021 at Great Ormond Street Hospital were included. Pre-and post-op CT scans were analysed using Materialise Mimics 3D software to produce 3D models of the upper airway. Non-mobile skeletal landmarks were registered on both pre-and post-op CT scans to enable accurate comparison of airway changes between the 2 time points. 3D phantoms were generated by isolating areas with air on CT scans (-1024 to -199 Hounsfield units). Materialise 3-Matic 3D software was used to analyse airway variables: volume (total pharyngeal, nasopharynx, and oropharynx), surface area, cross-sectional area, sphericity, and proportion of airway constrictions (constricted airway was defined as areas where airway diameter was less than 4 millimeters).
Results: The data was transformed to reflect relative percentage changes in variables versus absolute value change. This was to account for variances in age and clinical presentation in the study population. Significant increases were measured in total pharyngeal (76% mean increase), nasopharyngeal (277%), and oropharyngeal (54%) volume following fronto-facial surgery. Surface area (58.57% mean increase) and cross-sectional area (21.57%) of airway increased. No significant differences in sphericity and proportion of airway constriction were detected.
Conclusions: 3D technology can demonstrate the complex changes that result from fronto-facial surgery in children with syndromic craniosynostosis. Although there is some evidence that surgery improves functional aspects of airway physiology, further work is needed to elicit precise variables that contribute to clinical outcomes.

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5 YEAR IRISH EXPERIENCE OF MICROBIOLOGICAL EVALUATION OF PAEDIATRIC EMPYEMA IN POST PCV13 ERA

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Aims: The purpose of this study was to review the laboratory investigation of childhood complicated parapneumonic effusion or empyema with a view to optimising diagnosis.
Methods: This retrospective review was undertaken in two acute tertiary referral paediatric hospitals, over a five-year period, from January 2014 to December 2018. Cases of complicated parapneumonic effusion or empyema were only included if a sterile site specimens such as blood and pleural fluid were taken for diagnostic microbiologic evaluation - culture and PCR. Baseline patient demographic data, clinical findings, laboratory indices, microbiology results and imaging findings were collected.

Results: Sterile site specimens from 71 children with parapneumonic effusion/ empyema were identified. A causative bacteria was identified in 47 cases (66 %), 11 by conventional culture (pleural fluid, 9; blood, 2) and 55 by PCR (pleural fluid, 42; blood, 13). Conventional culture result had a low yield: pleural fluid culture positive in 13% (9 of 70 tested) and blood culture positive in 3% cases (2 of 64 tested).
PCR had the highest detection rate of causative organisms: pleural fluid PCR positive in 63% cases (42 of 66 tested); blood PCR positive in 50% (13 of 26 tested); *Streptococcus pneumonia* was the causative organism detected in 76% of cases.

Conclusion: The diagnostic yield of blood and pleural fluid culture is low in children with parapneumonic effusion or empyema(1-4). PCR of blood and pleural fluid significantly increased the diagnostic yield. PCR of pleural fluid was the most useful diagnostic investigation of parapneumonic effusion and empyema in this paediatric population. *Streptococcus pneumoniae* was the most common microorganism identified.

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Quick Jab Presentation Time: 15.35-15.40
Sub-Specialty

THE IMPACT OF EMPLOYING DIFFERENT METHODS FOR GROWTH HORMONE DOSE CALCULATION IN CHILDREN AND ADOLESCENTS WITH PRADER WILLI SYNDROME (PWS)

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Background:
Growth Hormone (GH) therapy has revolutionised the morbidity and mortality of those PWS. In Europe GH dose calculation is made using body weight rather than body surface area (BSA) as in the US. However, in the presence of obesity using body weight to calculate GH dose may be inappropriate.

Aims:
To explore the difference in the calculated dose of GH when based on actual weight, corrected weight and BSA in order to optimise growth hormone therapy in children with PWS.

Methods:
We took all 47 children, aged between 1 and 18 years, who were on established GH therapy from the Childhood PWS service. Current GH dose was compared with the maximum possible dose based on weight and BSA. The licensed GH dose for PWS; 0.035mg/kg/d or 1mg/m^2/d, was used for calculations. In those whose weight exceeded the 97th centile for age and sex, the 50th centile weight was used. IGF1 and its binding protein IGFBP3, are used to monitor GH therapy and were measured on all participants.

Results:
In 62%, the permitted GH dose was higher when calculated using BSA rather than weight. Of these children, 72% had IGF-1 levels within the normal range, therefore indicating that their dose of GH could be increased. Only 13% of the children with PWS, treated with growth hormone had a weight above the 97th centile for their age and sex, all of which could increase their GH dose when based on BSA calculation. 34% of the overall cohort had high IGF1 levels and therefore were not considered for escalation of GH dosage.

Conclusions:
Calculation of GH using BSA allowed for a greater optimisation of GH therapy in the majority of the cohort when compared to calculation using body weight. BSA also appears a more appropriate method to calculate GH dose in those with PWS due to the changes in body composition in this cohort.

SYMPTOM BURDEN AND MANAGEMENT AT END OF LIFE IN CHILDREN WITH NEURO-DISABILITY

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Aims:
To determine the incidence of complex symptoms in children at end of life with neuro-disability

Methods:
A single centre retrospective observational study was performed in Cork University Hospital between January 2016 – May 2019. Children between 0-16 years with an underlying neuro-disability who had been referred to the palliative care team and died in-hospital or had an in-patient stay within one month of their death were included.

Results:
Fourteen children were included, with a median age of 11.2 years at death. 35.7% died at home. This lower than national average of home deaths was felt to be attributed to the exclusion of oncology patients as they were not cared for in our centre. Children experienced a significant symptom burden, specifically neurological, gastrointestinal and respiratory symptoms. 85.7% had a background of epilepsy, with over half having difficult to control seizures requiring multiple medications and routes of administration. Agitation and irritability was reported in 50% and over 70% of children with these symptoms also had difficult to control seizures. Poor gut health hindered absorption of medications, limited routes of administration and subsequently led to deterioration of symptom control. Respiratory symptoms were prevalent in 92.3% of cases and ultimately the most common cause for death. A collaborative team approach was evident in the care of each patient with all having input form allied health care and over 70% receiving input from consult teams.

Conclusion:
Optimisation of symptom control can be hugely challenging but should always be possible, in the patient and carers preferred place of care. Access to specialist palliative care services should be early in disease trajectory and should be equitable. Palliative care aims to help ordinary people who find themselves and their families in extraordinary situations (1). Our goal must forever be to ensure each child lives and dies well (2).

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Quick Jabs Presentation Time: 15.45-15.50
Neonatal

BLOOD SAMPLING IN EXTREMELY LOW BIRTHWEIGHT INFANTS IN THE NICU BETWEEN 2010 AND 2020: MORE FOR LESS

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Background: Blood sampling in critically unwell neonates can account for up to 60% of their total blood volume. Samples are often done 'routinely' to guide ventilatory and electrolyte management. Over the last decade, our unit has noted increased use of non-invasive ventilation and a reduction in ventilator days. We now follow a strict policy of performing only 'essential' blood tests to reduce neonatal blood loss and stress. We wanted to see if these changes were paralleled with a reduction in blood sampling for laboratory analysis.

Methods: Retrospective collection of laboratory blood sampling data on the 25 smallest extremely low birth weight babies (ELBW) in 2010 and 2020 using the laboratory information system.

Results: The median birth weight of babies was 740g vs 615g, 2010 vs 2020, ($p<.001$). Median gestation was 27+4 vs 25+2 weeks, 2010 vs 2020, $p=.005$). The median length of stay was longer in 2010 (61 vs 41 days, $p=.168$).

The frequency of laboratory sampling decreased in 2020 compared to 2010. This difference was most significant in the first week of NICU admission, when the 2010 cohort underwent an average of 3.4 tests per baby per day vs 1.6 tests in 2020. The mean blood volume drawn per day in the first week was 1ml vs 0.5ml (2010 vs 2020). The mean blood volume drawn per day in the neonatal unit overall was 0.4ml vs 0.2ml. Using the median NICU length of stay for each time period volumes taken were 22ml vs 7.5ml (2010 vs 2020).

Conclusion: There was a clinically and statistically significant reduction in the frequency of laboratory blood testing in EBLW infants in our NICU between 2010 and 2020. Removing 'routine' sampling for babies and replacing with a targeted lower frequency and volume approach has been effective in our neonatal unit.

THE RELATIONSHIP BETWEEN PULMONARY HYPERTENSION AND DIASTOLIC DYSFUNCTION IN INFANTS WITH DOWN SYNDROME

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Aim: The estimated incidence of pulmonary hypertension (PH) in infants with Down Syndrome (DS) is 30%. The aim of this study was to evaluate if diastolic dysfunction may contribute to PH in infants with DS in the early newborn period.

Methods: This was a prospective study of 70 infants with DS and 60 controls who underwent comprehensive echocardiography evaluations over the first 3 days following delivery. Left ventricular (LV) diastolic function was measured using mitral valve inflow velocities and LV lateral wall tissue Doppler imaging to assess left atrial pressure (Ee`). Speckle tracking echocardiography (STE) was used to assess LV and right ventricular (RV) systolic and diastolic function. Pulmonary vascular resistance (PVR) was assessed using pulmonary artery acceleration time (PAAT) indexed to right ventricular ejection time (RVET), and LV eccentricity index (EI).

Results: Infants with DS had a lower gestation (37.7 ± 2.1 vs. 39.6 ± 1.2 weeks, $p<0.01$) and birthweight (3.02 ± 0.68 vs. 3.56 ± 0.42 Kg, $p<0.01$). Infants with DS had higher markers of PVR throughout the study period. LV and RV systolic function was also lower in infants with DS. There was a significant positive correlation between left ventricular (LV) early diastolic strain rate and pulmonary artery acceleration time (PAAT) measurements, $r = 0.46$ ($p < 0.01$) and a significant negative correlation between Ee' ratio and PAAT measurements, $r = -0.37$ ($p < 0.01$). There was a significant positive correlation between PAAT measurements and RV free wall strain, $r = 0.34$ ($p < 0.01$).

Conclusions: Our data demonstrates that intrinsic LV diastolic impairment is directly associated with higher indices of PH, which in turn depresses RV systolic performance in the DS population. Such findings highlight ventricular interdependence and the importance of biventricular appraisal when evaluating the relationship between PH and myocardial performance.

EPIDEMIOLOGICAL STUDY OF SUBDURAL HAEMORRHAGE IN INFANCY IN THE REPUBLIC OF IRELAND

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Aim:
To describe the incidence, aetiology, and clinical presentation of infants with SDH in Ireland. No data has yet been published relating to infant SDH specific to an Irish cohort. Mapping the epidemiology of injuries and disease processes helps to inform healthcare systems.

Methods:
New cases of SDH among infants (< 12 months) were prospectively reported throughthe established Irish Paediatric Surveillance Unit (IPSU). Infants ≤ 28 days were excluded. Questionnaires explored antenatal, perinatal, clinical, and radiological parameters and determination of cause.

Results:
There were 14 cases of infant SDH newly diagnosed by computerised tomography (CT) or magnetic resonance (MR) neuroimaging between November 2019- March 2021 i.e 16/100,000 of the infant population in Ireland/ annum. Abusive Head Trauma (AHT) accounted for 4/14 cases and accidental trauma for 4 /14. One case was undetermined but 5/14 had an organic aetiology. The average age at time of presentation was 16.8 weeks. Seizures were more common in cases of AHT (3/4) as compared to accidental trauma (1/4) or organic aetiologies (3/5). Only the AHT group presented with focal seizures. Bruising was found more often in cases of accidental head trauma (n=3) compared with AHT (n= 2). All infants in the AHT category presented in clinical shock and were more likely to be hemodynamically unstable. Retinal examination was performed in 12/14 cases and more common in AHT (n=3/4) compared to 1/5 organic and n=1/4 accidental. Retinal haemorrhages were seen in 5 cases, AHT accounted for 3/5 of these. All infants with AHT had skeletal surveys and fractures were noted in 2/4. A drop in haemoglobin of > 2gm/dl was noted in (n=3/4) of the AHT category.

Conclusions:
In Irish Infants the presentation and patterns of injury appears to differ between accidental / organic causes of SDH and AHT. The rate of AHT is lower than that previously reported in other countries. Dropping haemoglobin and seizures may be important identifiers for AHT.

FOUNDER MUTATION IN *OTOG* CAUSING NON-SYNDROMIC SENSORINEURAL HEARING LOSS IN IRISH TRAVELLER FAMILIES

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Introduction:
Deafness is a common multifactorial disorder with numerous underlying causes (genetic, infectious, trauma). Greater than 100 genes have been identified in non-syndromic sensorineural hearing loss (SNHL), and 70% follow a recessive inheritance pattern. *OTOG* (MIM: 604487, chr11:17,547,258-17,646,043) encodes otogelin, a non-collagenous protein specific to the inner ear. Pathogenic variant in *OTOG* result in mild-to-moderate non-syndromic SNHL. To date, only 12 families (26 individuals), have been reported in the literature.

Case series:
We report four families from the Irish Travelling Community (11 individuals), with a recurrent homozygous variant in *OTOG* (c.3700C>T; p.Arg1234*) resulting in non-syndromic SNHL. The median current age is 9.8 years (range: 2-30 years). Over half the individuals (n=6) were referred for investigations after failed new-born hearing screening, with others referred due to speech delay. All individuals have a mild to moderate SNHL, with characteristic U-shaped or down-sloping audiogram. The SNHL was non-progressive. There were no features of vestibular dysfunction. 2 had additional development delay, related to pathogenic CNV in one individual.

Discussion:
This is the largest cohort published to date and the first case series of Irish Traveller individuals with SNHL due to homozygous variant in *OTOG* (c.3700C>T:p.Arg1234*). This is a founder mutation with the Irish Travellers and clinicians need to ensure that this is requested in infants who fail new-born screening from this ethnicity. Similar to previously reported cases of *OTOG*- associated SNHL, deafness in our cohort was non-progressive mild-moderate SNHL, even in our adult patients.

Conclusion:
This case series is the largest cohort of *OTOG* patients (n=11) reported to date and highlights a founder mutation in *OTOG* in the Irish Traveller population causing mild-moderate SNHL.

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'PUT THE BLEEP TO SLEEP' AND 'TRANSCRIBE BY THURSDAY' – A DUAL QUALITY IMPROVEMENT INITIATIVE

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AIMS:
To reduce on-call NCHD-bleep frequency related to non-urgent tasks including medication transcription and prescription. Use a multi-disciplinary approach to promote NCHD daytime transcribing of patient Kardexes by Thursday's. To improve patient safety by increasing efficiency of non-urgent task completion on-call. To enact a lasting change that transcends the 6-monthly NCHD-changeover.

METHODS:
Two audit cycles took place between October 2020 and July 2021. Initial audit identified a high frequency of on-call bleeps related to non-urgent tasks, predominantly medication transcription and prescription. A multidisciplinary working group, led by NCHDs, used a two-pronged approach.

Transcribe by Thursday:
Identification of drug Kardexes needing transcription and highlighting them to NCHDs by day, using a magnetic smiley-face by the patient's name on the ward census board.

Putting the Bleep to sleep:
A non-urgent task list is filled by nursing staff overnight, highlighting tasks that can wait until the next SHO "ward sweep" each night, performed at 10-11pm, 3-4am and 7-8am.
The NCHD leads subsequently passed the project onto new colleagues at changeover time to secure ongoing investment and oversight in the project.

RESULTS:
Comparing post-intervention audits prior to the January 2021 and July 2021 NCHD-changeovers. Total number of bleeps to rewrite Kardex meds reduced from 103 to 44**.** Mean number of bleeps to rewrite Kardex medications reduced by 43% (5pm-11pm) and 61% (11pm-9am). Mean number of bleeps per night was reduced from 13.8 to 8.56 (40%-reduction). Multiple bleeps from same ward in a 5-minute period reduced by 59% (5-11pm) and 44% (11pm-9am) respectively. Qualitative changes to overnight ward tasks, reported by NCHDs, reflected a reduction in both overall Kardex correction and multiple overnight requests.

CONCLUSIONS:
The intervention markedly reduced on-call bleeps related to non-urgent tasks. This project will require regular re-audit and multidisciplinary input to achieve and maintain its goals of improving NCHD and patient welfare.

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Children and Adolescents with Eating disorders admitted to CHI at Temple st over a 5 year period (2016 – 2020)

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Aims

To establish changing patterns and profiles of young people admitted to CHI at Temple St with eating disorders (ED's) during a 5-year period (2016 - 2020).

Methods

A retrospective chart review of all patients admitted to CHI at Temple St with ED's over a 5-year period between 1st January 2016 - 31st December 2020. Approval was granted from the Research Committee in CHI at Temple St.

Results

There were 75 admissions (65 individual patients) from 2016 – 2020 with 45% of these admissions occurring in 2020 alone. Mean age 13.8 years (range 9.3 - 16.1 years). Mean length of admission 33.9 days (median 28 days). 82.6% (62/75) admissions had a diagnosis of anorexia nervosa restrictive subtype (AN-R). Mean % median BMI: 82.4% (range 63.4%-115%). 28% (21/75) of admissions required nasogastric supplementation and this group had a longer mean hospital stay (44 days compared to 33.9 days). The increase in presentations amounted to 1068 admission days in 2020 compared with 607 days in 2019 and 291 in 2018. 17% (13/75) admissions were male but more than half of these occurred in 2020. 10.6% (8/75) of admissions were transferred to an inpatient unit with half of those presenting in 2020.

Conclusion

CHI Temple St has seen a year on year increase in ED admissions. During the first year of COVID-19, we have seen a significant increase in male presentations, admissions and bed days due to ED's. The rate of admission to inpatient units has remained stable despite the increased number of patients. This increase in activity needs to be reflected in allocation of resources to acute paediatric hospitals to manage these cases.

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THE OUTCOMES OF INFANTS WITH RISK FACTORS DEVELOPMENTAL DYSPLASIA OF THE HIP AND USE OF X-RAY FOR FOLLOW UP.

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Background:
Developmental dysplasia of the hip (DDH) is a common cause of morbidity (1). The national screening tool was last updated in 2017 and is used in all 19 maternity units in Ireland. If there is a normal clinical examination and ultrasound within 6 weeks at risk patients are followed up in primary care thereafter. (2). The local policy requires a follow up x-ray at 6 months (CGA) for all of the risk group.

Methods:
A retrospective audit was undertaken from January 2019 to September 2019 of the risk population enrolled for DDH follow up at discharge in St. Luke's Hospital Kilkenny.

Results:
134 infants were identified. 5 patients fell outside the national risk screening criteria, none of which required treatment. 54% were followed up for family history, 30% singleton breech and 9% twin breech. 20% had an abnormal examination including click (16%), dislocation (1%) or tight abduction (3%).
129 patients required imaging. 124 patients received initial ultrasound and 95% (N=118) were done within 6 weeks CGA. 7 patients required treatment following ultrasound, with Pavlick's Harness. 111 followed up for x-rays. A further 9 patients required treatment with Boston Brace following x-ray identification. Of this group 8 of them had a normal 6 week ultrasound and 1 did not attend the 6 week ultrasound.
12% of the entire risk group needed treatment for DDH within 9 months of life. 44% were identified using ultrasound within 6 weeks. The other 56% were effectively picked up by x-ray. Risk factors of those in treatment included 44% with a positive family history, 44% breech and 6% had a hip click and 6% had tight abduction on examination.

Conclusion:
The additional use of x-ray increased the effective diagnosis and early treatment of DDH by 128% (N=7 v N=16) in the risk population. The use of adjunct x-ray was effective in diagnosing additional cases of DDH.

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