extremities, from which the angle of knee joint extension was determined. Statistics were given as mean (SD = standard deviation). A paired *t* test was used to detect differences between scores. Statistical significance was determined as a *p*-value <0,05.

Main results Preoperative knee flexion deficiency ranged from 10 to 90°. Mean preoperative flexion contracture was 26.6° (SD= 18.9). After surgery knee flexion contracture (6.9°, SD= 10.4) has significantly decreased (*p*<0,05). Mean correction amount of flexion contracture was 77.7% (SD= 22.3%). Mean preoperative score of Gillette FAQ scale was 2 (SD= 1). After surgery mean Gillette FAQ score (3, SD= 1) has significantly improved (*p*<0,05). Three patients had following complications: synovitis knee joints after immobilization period, 20° and 60° knee joints extensor contractures at examination after one year since surgery. For patients of the reference group, the average angle of knee joint extension was 1 ° recurvation (SD=3).

Conclusions The obtained data indicate a rather high efficacy of surgical treatment both in terms of goniometric and functional indicators. However, the average angle of knee joint extension after surgery is significantly less than the reference value (*p*<0,05) and it is necessary to consider possible complications associated with requirement for long-term postsurgery immobilization.

GP12 DEVELOPMENTAL DYSPLASIA OF HIP – SCREENING WITHOUT RADIOGRAPHS; IS IT TIME?

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Background The optimum screening programme for developmental dysplasia of the hip remains elusive. Ireland has introduced a new national screening guideline based on selective USS.

Aim This study aims to determine the sensitivity of the new national guideline through a retrospective audit in one large teaching hospital.

Methods All infants referred for DDH imaging between 08/09/18 and 08/03/19 were included in the study. Infants with a normal USS (table 1) at 6 weeks were followed to radiograph at 6 months. A chart review of all infants with normal USS but abnormal or concerning radiograph was conducted to determine outcome.

Abstract GP12 Table 1

	DDH	No DDH	
Hip USS + ve	True Positive N = 61	Presume N = 0 as charts not reviewed	PPV - not calculated
Hip USS - ve	False Negative N = 61	True Negative N = 477	NPV = TN/FN + TN NPV = 88.6%
	Sensitivity = TP/TP + FN Sensitivity = 50%		

Results 716 infants (17.3% of births) were referred for imaging based on clinical exam and current risk criteria. Of these,

655 infants (91.5%) had normal USS hips at 6 weeks. At 6 months 158 infants (24%) with normal USS had an abnormal or concerning x-ray pelvis. 131 (11.6%) were subject to surveillance but later discharged. 61 (9.3%) remain under surveillance, 13 (2%) required bracing. 74 (11%) DNA'd follow up appointments. To date none of the infants who had a normal USS have required surgery.

Discussion and conclusion A retrospective audit using USS with the addition of radiograph identified a potential 0 - 9.3% false negative rate and a sensitivity of 50%. While these figures are concerning, following the 61 infants currently under surveillance is important. Should no infant with normal USS require surgery clinicians may be more confident in the new national guideline.

GP13 DIFFERENTIAL MIRNA EXPRESSION IN CF AND GENE CORRECTED IPSC-DERIVED LUNG ORGANIDS

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Background Cystic fibrosis (CF) is one of the most common lethal genetic diseases and is caused by mutations in the CFTR gene where a deletion of phenylalanine at position 508 (F508del) accounts for the most prevalent mutation worldwide. MicroRNA (miRNA) are small non-coding RNAs that can regulate up to two thirds of gene expression in human cells and have been shown to be dysregulated in the CF airway and implicated in the direct control of CFTR. Induced Pluripotent stem cells (iPSC) can be routinely generated from any patient and contain that person's unique genetic background, CF mutation and can form all the cell types affected by CF representing an attractive tool to advance the understanding of CF. Recent advances in iPSC technology have led to an *in vitro* platform of airway epithelial organoids derived from CF and CF-corrected cells for modelling CF lung disease however this model requires further molecular characterisation. We hypothesise that specific miRNA play a key role in the pathogenesis of CF lung disease and airway organoids generated from patient derived iPSCs can better elucidate this role.

Methods Cystic fibrosis patient specific iPSC derived airway organoids were generated from an individual homozygous for the F508del mutation (ΔF508/ΔF508) and its gene corrected counterpart (ΔF508/wild-type [WT]) using established protocols. Expression of a miRNA panel we have previously shown to regulate CFTR (miR-145, miR-223 and miR-494) were examined in CF versus CF corrected iPSC lines at Day 0 and Day 32 following directed differentiation of iPSC into proximal airway organoids.

Results In preliminary work we have observed that miRNA known to target CFTR are detectable in CF and gene-corrected iPSC lines and differential expression is observed between cells at the pluripotent stage (iPSC) at Day 0 and cells that have been differentiated in 3D as organoids to airway-like cells (bronchospheres) at Day 32. Importantly, there is differential expression of key CFTR related miRNA when we compare CF patient-derived bronchospheres to those where the F508del mutation has been corrected. Increased expression of miR-494 was observed in CF vs. CF corrected

cells whereas levels of miR-145 and -223 appeared to be reduced.

Conclusions We have demonstrated for the first time that miRNA are detectable in CF iPSC derived bronchospheres with altered expression following a directed differentiation approach of iPSC into proximalised airway epithelium. Expression patterns in iPSC may be different to patient bronchial epithelial cells previously described and warrants further investigation.

GP14

ADOLESCENTS USE OF METAPHORS TO NARRATE THEIR EXPERIENCE'S OF LIVING WITH CHRONIC KIDNEY DISEASE: AN IRISH PERSPECTIVE

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Objective Chronic Kidney Disease (CKD) is a debilitating lifelong condition, which can impact many aspects of a person's life. Experiencing CKD during adolescence is further complicated by the multitude of developmental changes that young people go through at this time period. There is limited research that examines the perspectives of adolescents living with CKD and how they make sense of their experiences. This poster presentation will display/illustrate how adolescents' use metaphors to narrate their experiences of living with Chronic Kidney Disease. These findings were identified from a qualitative narrative study examining Irish adolescents' embodied experience of living with CKD.

Methods A narrative study using an ethnographic approach was used in this study. Multiple methods were used to engage with five adolescents (10–17 years) living with CKD over an 18-month timeframe in both hospital and home settings. Data was collected from participants through participant observation, informal interviews and participatory methods i.e. body mapping. The collective stories of the adolescents were analysed using Riesman's approach to narrative analysis.

Results The findings of this study reveal that adolescents use visual and textual metaphors as a strategy for communicating the complexities of living with CKD. Within their narratives, adolescents, used scientific metaphors (CKD as a 'black hole' and 'atom'), journey metaphors (*Orbiting*) and supernatural metaphors (*alien or vampire*) to portray themselves and their condition, and to articulate their experiences in ways that were meaningful to them.

Discussion The findings of this study offer a unique contribution to knowledge by highlighting the fact that metaphors are essential to adolescents' narrations about living with, and communicating about, CKD experiences. Understanding how adolescents communicate about and experience their chronic condition is critical to enable health care providers to appreciate CKD beyond its physical and medical context; thereby providing awareness of the personal implications of chronic disease management on young people's psychological and social health and wellbeing. These findings have further implications for how health care providers might effectively communicate with adolescents about their personal experiences of living with CKD.

GP15

PHENYLALANINE MEASUREMENTS IN HUMAN BLOOD USING NIR SPECTROSCOPY AND DBS, A PRELIMINARY STUDY

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Introduction Phenylketonuria (PKU MIM 261600) is a human metabolic disease caused by mutations in phenylalanine hydroxylase gene (PAH) and is inherited in an autosomal recessive Mendelian fashion. Phenylalanine hydroxylase (PAH also known as phenylalanine 4-monooxygenase EC 1,14,16,11) catalyzes the rate-limiting step in L-Phenylalanine (L-Phe) catabolism in liver, using tetrahydrobiopterin (BH₄) and dioxygen as additional cosubstrates. Untreated PKU is associated with an abnormal phenotype which includes growth failure, poor skin pigmentation, microcephaly, seizures, global developmental delay and severe intellectual impairment. However, since the introduction of newborn screening programs and with early dietary intervention, children born with PKU can now expect to lead relatively normal lives. Dried Blood Spot, (DBS) is the golden method used to acquire specimen for neonatal screening of PKU. It is fast, not expensive and give the possibility to collect samples far from the reference centre and to quickly delivery to the analytical laboratory, where the Phe content is evaluated by Tandem Mass Chromatography. However, because PKU needs a continuous followup, would be really worth to set a new, fast, reproducible and chipper biochemical approach to monitor patients and to optimize the dietary intervention. Here we describe a novel fast and non-destructive method to assay phenylalanine in human blood using Near Infra-Red (NIR) spectroscopy.

Methods By using a mobile infrared micro sensor (SCIO sensor) calibrated in the Near Infrared spectrum (700nm to 1000nm), we acquired by scanning and elaborated spectra from DBS card alone, DBS card with a reference concentration scale for Phe alone, and Phe plus Tyr. Based on these data we selected the most sensitive wavelength window within the NIR and exploited this parameter to acquire spectra from DBS containing blood spiked with 0 to 1200 µM Phe, 0 to 1200 Tyr and with different Phe/Tyr ratios. An additional experiment using 100 calibrators with 5 datapoints for phenylalaninemia was performed. For each sample, at least 20 scans in duplicate were acquired. Principal component analysis (PCA) was conducted.

Results The analysis of the 'scrubbed' data both by a specific image elaboration software and by data point algorithms, clearly show that it is possible to correlate the nature of the analyte,