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,

and its relative concentration with significant differences in the acquired spectra, to obtain the so called specific Phe NIR fingerprint of the sample. These observations open the exciting possibility to design a chemometric model to assay the amount of Phe in DBS without elution and the expensive chromatographic procedures.

GP16 EFFECT OF DROPLET SIZE ON AEROSOL DELIVERY DURING SIMULATED NEONATAL MECHANICAL VENTILATION

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Introduction Invasive mechanical ventilation is a mainstay in neonatal intensive care and co-administration of aerosolised therapeutics is commonly prescribed. Considering their rapid breathing rate, low tidal volumes, small airways and interfaces, neonates present unique challenges for aerosol therapy. The objective of this study was to assess the effect of droplet size on aerosol delivery during simulated ventilation of a neonate.

Methods Simulated neonatal mechanical ventilation assessed the lung dose beyond the endotracheal tube (ETT) across two potential nebuliser placement positions within the circuit; at the dry side of the humidifier and between the Wye and ETT. 2ml of 2 mg/ml salbutamol was nebulised using two vibrating mesh nebulisers (Aerogen Solo, Aerogen, Ireland) of varying droplet size (2.76µm and 4.30µm respectively). A vibrating mesh nebuliser was chosen as it does not add flow or pressure to the ventilator circuit. A neonatal ventilator (VN500, Dräger, Germany) (V_T10mL, 60BPM, I:E ratio 1:2) in combination with a 2.5 mm ETT and humidified circuit was used. Lung dose was quantified after capturing aerosol on an absolute filter (RespirGard II 303, Baxter, Ireland) positioned between the ETT and test lung. The mass of drug eluted was determined using UV Spectrophotometry at 276nm. Results were expressed as a percentage of the nominal dose placed in the nebuliser medication cup.

Results

Abstract GP16 Table 1 Lung dose (%) using two nebulisers of varying droplet size, at two positions within the circuit. P-values are included to indicate significance.

Nebuliser position	Lung dose (%)	Lung dose (%)	P-value
	2.76µm	4.30µm	
Dry side of the humidifier	1.93 ± 0.20	1.39 ± 0.11	0.02
Between Wye and ETT	3.88 ± 1.24	2.75 ± 0.77	0.25

Discussion Increasing droplet size was associated with a significantly reduced lung dose when the nebuliser was positioned at the dry side of the humidifier (p-value = 0.02). Increasing droplet size was associated with a reduced lung dose when the nebuliser was placed between the Wye and ETT. However, this difference was not found to be statistically significant (p-value = 0.25). In conclusion, these findings demonstrate that droplet size affects aerosol delivery during neonatal mechanical ventilation.

GP17 DISTRIBUTION OF NON-FUNCTIONAL ALLELE OF CYP2D6 GENE (RS1065852) AMONG BURYAT ADOLESCENTS

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Introduction Individual reaction to medicine is determined by genetic factors. The CYP2D6 gene is involved in the metabolism of 20–25% of medication. The carriage of CYP2D6*10 determines the synthesis of a defective protein with a reduced activity of the CYP2D6 isoenzyme, which determines the difference in interindividual medicine variability and an increased risk of undesirable drug reactions. Distribution of CYP2D6*10 varies in different races and ethnic groups.

Methods In 151 Buryat adolescents, DNA was isolated from whole venous blood, the allelic composition was determined by the CYP2D6*10 gene polymorphism (rs1065852). The average age of the subjects was 16.02±2.05 years. Buryats belong to the indigenous people living on the Asian part of Russia. They belong to the Mongoloid race and are part of the small North Asian race. When forming the samples, ethnicity was taken into account in at least three generations.

Result Identified carriers of two genotypes rs1065852 CYP2D6*10: SS (70.19%) and CT (29.81%). The prevalence of functional C-allele was 85.1%; non-functional T-allele - 14.9%. When comparing the prevalence of non-functional T-allele rs1065852 CYP2D6*10 with the same indicator in other populations of the world, significant differences with the Mongols (T-allele frequency 55.0%, p<0.001), Japanese (T-allele frequency 44.7%, p<0.001), Filipinos (5.4%, p<0.001), Bedouins (4.7%, p=0.0146), representatives of the Mbuti tribe (0%, p=0.0366). No significant differences in the prevalence of non-functional T-allele rs1065852 CYP2D6*10 with Caucasians (12.5–22.5%), Yakuts (17.5%), Japanese (15.0%), African Americans (9.9–13%) and some residents of the Middle East (7.9–25.9%).

Conclusions The presence of significant differences in distribution of non-functional T-allele CYP2D6*10 (rs1065852) in the Buryat population was shown in comparison with some populations of the Mongoloid and Negroid races.

GP18 NEONATES BORN TO RHESUS POSITIVE WOMEN WITH PERINATALLY-DETECTED RED CELL ANTIBODIES: A CASE SERIES

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Background Haemolytic Disease of the Fetus & Newborn (HDFN) results from maternal IgG red cell allo-antibodies crossing the placenta & binding to their corresponding antigen on red cells in the fetal circulation. Immune haemolysis can cause varying degrees of anaemia & unconjugated hyperbilirubinaemia in the fetus & neonate.

At present, all women have bloods drawn for group & antibody screen at booking. For expectant mother who test RhD positive, repeat antibody screening is *not* carried out in the absence of antibodies at booking.