stream device (microstream capnography). The side-stream results were also compared to arterial or capillary CO₂ (PCO₂) results. Respiratory disease severity was classified according to the ratio of dead space to tidal volume (Vd/Vt), which was calculated using the modified Bohr's equation. Agreement between the results of the mainstream and side-stream device were assessed by Bland-Altman analysis with linear regression and Spearman's rank correlation used to evaluate the strength of relationships. Ethical approval was given by the London (Camden & King's Cross) Research Ethics Committee and parents gave informed written consent for their infants to take part in the study.

Results Fifty-four infants (28 male) were recruited with a median (IQR) gestational age of 31.6 (28.1–36.6) weeks and a birthweight of 1.43 (0.91–2.66) kg. There was a strong correlation between the results of the mainstream and side-stream devices ($r=0.93$; $p<0.001$). The mean constant bias between the two methods of EtCO₂ monitoring was -0.49 ± 0.43 kPa (95% agreement levels -1.33 to 0.36 kPa). Side stream EtCO₂ predicted PCO₂ better in infants with less severe lung disease ($Vd/Vt<0.35$, $r^2=0.72$; $p<0.001$) than in infants with more severe lung disease ($Vd/Vt>0.35$, $r^2=0.35$; $p=0.002$).

Conclusion Side-stream capnography performed similarly to the gold standard mainstream capnography. The relationship of EtCO₂ to arterial or capillary CO₂ levels diverged with increasing respiratory disease severity, likely as a result of a higher physiological dead space and greater ventilation perfusion mismatch.

G553

PREVALENCE AND PATTERN OF PRENATAL ALCOHOL EXPOSURE DETERMINED BY ALCOHOL BIOMARKERS IN NEWBORN BLOOD SPOT SCREENING CARDS

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Fetal alcohol spectrum disorder (FASD) is the commonest preventable cause of preventable neurodisability but is under-diagnosed. Earlier diagnosis helps prevent secondary effects of FASD, resulting in better educational attainment and earlier healthcare interventions. Maternal self-report of prenatal alcohol exposure (PAE) is negligible, despite 1 in 7 women in Scotland drinking alcohol in pregnancy, as determined by alcohol biomarkers in meconium (Abernethy et al). Phosphatidylethanol (PEth), a direct metabolite of ethanol can be measured from newborn dried blood spot cards. In adults, PEth is 100% specific for alcohol exposure in blood samples for up to 12 days after a single drink. Blood spots cards are collected from almost all infants in the UK on day five and stored; retrospective testing might be possible when FASD is suspected.

Objective To investigate the potential utility of newborn blood spot cards for the detection of PAE to determine prevalence.

Population Total population of infants delivering in a single maternity hospital on each fourth day (random sample).

Methods 840 mother and infant dyads were recruited over an 11-month period to provide meconium and blood spot samples. The latter were collected coincident with routine newborn screening, when the original heel prick bleeding allowed. Maternal and infant demographics were collected via a health questionnaire. Samples were frozen and analysed at the University of Padova. The study had REC approval; all mothers gave written informed consent.

Results Blood spot cards were collected from 510 infants; 502 (98.5%) were analysable for PEth. 216 (43.0%) samples were positive for PEth and in 148 (29.5%) the concentration was > 20 ng/ml, indicative in adults of significant alcohol exposure. In the recruited cohort, 13.8% of mothers admitted to alcohol consumption beyond 20 weeks of pregnancy, 14.5% of meconium samples were positive for ethylglucuronide and 39.6% positive for fatty acid esters.

Conclusions Analysis of newborn blood screening cards for PEth is feasible. There is a need for further data correlating PEth values in the newborn with other biomarkers. Cut off values used for adults may overestimate PAE.

G554

INTRA- AND INTER-OBSERVER VARIABILITY IN PDA SIZE MEASURED ON TRANSTHORACIC ECHOCARDIOGRAPHY (TTE) IN EXTREMELY PRETERM BABIES

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Background The internal diameter of the patent ductus arteriosus (PDA) measured on transthoracic echocardiography (TTE) is commonly used in determining the need for treatment in clinical practice and enrolment in research trials. PDA size measured on TTE has not been well validated.

Objective To assess the intra- and inter-observer variability in PDA internal diameter measured on TTE on the same examination in babies born at ≤ 30 weeks' gestation admitted to St George's neonatal unit.

Methods We included 56 babies born ≤ 30 weeks' gestation that had a clinically indicated TTE. TTEs were performed by a single consultant neonatologist (AK) certified in echocardiography. PDAs were visualised using a high parasternal view, and cine-loops were stored on DICOM Radiology viewing software without measurement annotations.

PDAs were measured at the narrowest diameter on 2-Dimensional (2D) and Colour Doppler echocardiography

Abstract G554 Table 1

	Mean Difference	Max Difference	Min Difference	Bias	Upper Limit of Agreement	Lower Limit of Agreement	Repeatability Coefficient	Repeatability Index
2D	0.70	2.50	0.00	-0.04	1.67	-1.75	1.75	81%
Colour	0.96	2.50	0.00	-0.83	0.63	-2.30	1.49	62%

assessment. A second certified consultant (DD) measured the internal diameter of PDA on the same 2D and colour echocardiography cine-loops. They were blinded to each other's measurements. AK repeated measurements at a later date, blinded to his original measurements.

Results (Table 1) Bland-Altman Analysis examining PDA internal diameter measurements by two operators on the same cine-loop.

Intra-observer analysis showed an r^2 correlation coefficient of 0.68 (2D) and 0.53 (Colour). Comparison of all measurements showed Colour measurements a mean of 0.29 mm higher than 2D.

Conclusion The poor repeatability coefficients and repeatability indices, lead us to conclude that there is significant inter- and intra-observer variability in 2D and Colour echocardiography measurements of PDA diameter, even on the same cine-loops. Thresholds and timing of treatment for PDA remain controversial. We advise caution when using diameter as surrogate marker for degree of shunting.

G555

THE MATERNAL AND NEONATAL MICROBIOTA CORRELATES OF PRETERM BIRTH AND ADVERSE NEONATAL OUTCOMES

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Aims Preterm birth is the leading cause of perinatal morbidity and mortality worldwide. There is a need for a better understanding of the correlation of vaginal microbiota, placenta microbiota and placental inflammatory changes with preterm birth. Necrotizing enterocolitis (NEC) is the most devastating complication of prematurity which might be caused by intestinal dysbiosis. Our study aimed to explore the vaginal microbiota, placental microbiota and histological changes in the placenta correlates with preterm labor, and determine whether fecal microbiota in premature infants differs from the term infant.

Method A case-control design was used to enroll 50 women admitted in spontaneous labor between 26 to 36 weeks and 50 controls matched for age and parity who presented in labour after 37 weeks. At birth, the infants were also enrolled. We obtained a vaginal swab from the mother prior to delivery, placenta, infant rectal swabs or stool samples. These samples were assessed using 16S ribosomal RNA (rRNA) gene sequencing. Placentas for histopathological analysis. Using a bioinformatics approach phylogeny tree was created. Beta-diversity was calculated using Permutational Multivariate Analysis of variance and Bray-Curtis dissimilarity indices were measured.

Results The vaginal microbiota in both study groups revealed a community rich in the *Lactobacillus* genus; 90.4% of the sample consisted of different *Lactobacillus* species. There were no differences in community richness of microbiota between the term and preterm groups. Preterm placentas were associated with greater rates of inflammation (43.3%) compared to term placentas (23.3%). Placenta microbial samples had a sequence read success rate of only 5.7%. Three preterm infants (7.3%) developed NEC, one

(2.4%) preterm infant and one (2.4%) term infant developed gram-negative sepsis. General low yield of microbiota amongst the infants with NEC and Gram-negative sepsis in the meconium.

Conclusions There is a spectrum of diversity in vaginal microbiota of women with the term and preterm labor with no clear evidence of any specific microbiota composition patterns that are associated with preterm birth. Acute histological chorioamnionitis was associated with preterm birth. There is a lack of evidence to support the existence of a placenta microbiota. Our study supports the theory that a lack of commensal microbiota can lead to the development of NEC.

G556(P)

UTILITY OF CARDIAC ENZYMES IN THE DIAGNOSIS OF MYOCARDIAL DYSFUNCTION IN ASPHYXIATED TERM NEWBORNS – A PROSPECTIVE STUDY

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Background Perinatal Asphyxia is a multi-system disorder and its effects are not limited to central Nervous System. Cardiac impairment occurs in about 24–60% of neonates with asphyxia. Myocardial dysfunction secondary to severe birth asphyxia will lead to loss of cerebral auto-regulation with subsequent severe encephalopathy. This study was done to evaluate the usefulness of cardiac enzymes test in diagnosing myocardial injury in perinatal asphyxia as well as prognostic indicator of perinatal asphyxia.

Methodology A hospital based prospective analytical study performed in 100 asphyxiated term neonates admitted in our NICU from January 2017 to June 2018. Cardiac enzymes; CKMB and cardiac troponin-I were evaluated for sensitivity, specificity and diagnostic accuracy in comparison with clinical diagnosis of myocardial injury and were correlated with results from ECG, ECHO, duration of inotrope, severity of shock and outcome.

Results In our study among 100 term asphyxiated neonates, 79 neonates had clinical evidence of myocardial injury. We had larger number of neonates (41%) with stage 3 HIE while 35% were stage 1 HIE and 24% were stage 2 HIE. The ROC curve for cardiac dysfunction showed that the value of CKMB for prediction of cardiac dysfunction was 42 IU/L (sensitivity of 79.5%, specificity of 93.3%, diagnostic accuracy 87.3%). Similarly, the value of cardiac troponin I for prediction of cardiac dysfunction was 0.2 ng/ml (sensitivity 90.6%, specificity 96.7%, diagnostic accuracy is 97%). The cut off CKMB value for prediction of mortality in our study is 91.1 IU/L (sensitivity of 90.0%, specificity of 83.8% and diagnostic accuracy 88%) and for cardiac troponin I, it was more than 0.96 ng/ml (sensitivity of 93.3%, specificity 87.8%, diagnostic accuracy 93.2%). Also the value of CKMB and troponin I had strong statistical significance with severity of HIE ($p < 0.001$), severity of shock ($p < 0.001$) and duration of inotrope support ($p < 0.0001$).

Conclusion Cardiac enzymes are valuable tool in resource limited settings for early detection of myocardial injury due to perinatal asphyxia. The early detection and prompt treatment of condition will help in improving prognosis of these asphyxiated newborns.