and Behaviour Rating Scale (BRS) scores (estimate = -0.39; $p = 0.012$).

Conclusions Implementation of a neonatal pain and sedation protocol results in an increase in opiate prescription without affecting short-term outcome and neurodevelopmental performance of VLBWI at 12 months corrected age.

PO-0455 RESISTIVE INDEX (RI) OF CEREBRAL ARTERIES IN VERY PRETERM INFANTS: REFERENCE VALUES AND IMPACT OF PATENT DUCTUS ARTERIOSUS

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Background and aims We describe resistive index (RI) values in various cerebral arteries in a cohort of preterm infants born at <29 weeks gestation. We also aim to compare RI in various intracranial arteries, and to assess the relationship between RI and hemodynamically significant patent ductus arteriosus (PDA).

Methods Preterm infants admitted to our NICU between May 2010 and January 2013 were enrolled. RI of internal carotid arteries, basilar artery, anterior cerebral artery, pial and striatal arteries was obtained in the first three days of life and weekly after that until discharge or death.

Results 771 examinations were performed in 235 infants. RI differed depending on which artery was insonated. RI was negatively correlated with measured time averaged velocity, except in the basilar artery. There was a significant difference in RI when comparing left (mean 0.86) to right sided (0.84) internal carotid artery ($p = 0.023$). RI was lower in patients without PDA compared to patients with hemodynamically significant PDA, though this difference was small and not statistically significant in all arteries. There was no difference in pre- and postligation RI in patients who underwent PDA ligation. RI was not related to gestational age, postnatal age, SNAPPE II score or gender.

Conclusions For accurate follow-up and comparison of RI, it is important to examine the same artery. No definitive cut-off value for RI indicative for the presence of a hemodynamically significant PDA was found. Cerebral artery RI may have limited value as a clinical tool in the very preterm infant.

PO-0456 MEASURING CEREBRAL AUTOREGULATION. A COMPARISON OF FREQUENCY – AND TIME DOMAIN ANALYSIS

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Background and aims Cerebral autoregulation (CA) is described by the relation between mean arterial blood pressure and cerebral blood flow. The aim of this study was to compare frequency – and time domain analysis – two conventional methods used to describe CA.

Methods We measured cerebral oxygenation (as a surrogate for cerebral blood flow) and mean arterial blood pressure in 60 preterm infants in the first day of life. Coherence and gain were

calculated by means of frequency domain analysis. The cerebral oxyimetry index (COx) and the regression coefficient were calculated in the time domain. For both calculations 5 min windows were applied in 4–17 consecutive 10 min epochs of good quality signal in each infant. Analysis of variance was used to compare the intra-infant and inter-infant variation.

Results Discrimination among the infants was less good for coherence than for COx ($F = 3.4$ vs. 8.8). The correlation between coherence and COx was poor (Pearson's $r = 0.215$, $p = 0.097$). Applying conventional thresholds for 'impaired' autoregulation resulted in different classifications (Chi2 = 3.78 , $p = 0.052$). In one extreme case, gain was 0.68 microM/mmHg – the highest of all the infants – while the regression coefficient of the time-domain analysis was -0.33 microM/mmHg – the lowest of all. This was due to cerebral oxygenation and arterial blood pressure being in counterphase.

Conclusions Time domain analysis gave better discrimination among infants, suggesting better precision. Also, a high gain and high coherence may arise spuriously when cerebral oxygenation decreases as blood pressure increases.

PO-0457 ASSOCIATION BETWEEN EARLY VISUAL MOTION PERCEPTION IN VERY PRETERM CHILDREN AND NEURODEVELOPMENT AT 2.5 YEARS

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Introduction Young infants need visual motion perception to understand their environment. Gaze reflects the ability to track moving objects, and includes smooth pursuit (SP) eye movements, saccades and head movements.

Aim To investigate if early visual tracking ability in children born very preterm (VPT) is associated with later neurodevelopment.

Method The VPT infants ($n = 68$) had mean (SD) gestational age of 28.3 (2.6) weeks and birth weight 1154 (365) g. Ability to track moving objects was recorded at 4 months corrected age (CA) using a system combining electro-oculography and cameras recording head movements. Gaze and proportion of SP were measured. Tracking ability corresponding to at least the 10th percentile of a term born control group was defined as normal, and served as cut off for VPT infants. Neurodevelopment was assessed in VPT infants at 2.5 years (Bayley Scales of Infant Development III, BSID III).

Results At 4 months 37% and 25% of VPT infants had subnormal SP and Gaze, respectively. The table shows group differences in BSID III subscale scores for Gaze and SP, between children with normal compared to subnormal early visual tracking ability.

Abstract PO-0457 Table 1

	Cognition	Receptive communication	Expressive communication	Fine Motor	Gross Motor
Gaze	2.43***	1.92*	3.40***	1.94*	0.23
Smooth Pursuit	1.53**	0.71	1.92*	1.48	1.12

* $p < 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (independent sample's t-test)

Abstract PO-0459 Figure 1

Conclusions Neurodevelopment at preschool age is better for VPT children with normal SP and Gaze at 4 months. The effect of subnormal Gaze seems more pervasive, indicating head movements to compensate effectively for poor SP.

PO-0458 FULL-TERM NEWBORNS DETECT MATERNAL BREAST ODOURS AT A CORTICAL LEVEL: A MULTICHANNEL NIRS STUDY

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Background and aims Behavioural and physiological changes have been recorded in newborns following exposure to maternal odours. We aimed to investigate the cortical activation following the presentation of maternal breast odours (MBO).

Methods We used a multichannel NIRS device to record bilaterally cortical activation in the orbito-frontal gyri (OFG), prefrontal (PFC) and primary somatosensory (S1) cortices during 50 s (10 s baseline, 10 s presentation, 30 s post-stimuli). Odours were presented in controlled conditions (silent room, active sleep, randomised order) using cotton cloths: clean (CC) and worn by the mother in her bra during preceding 12 h (MBO). Seventeen full-term infants were included. After systematic artefact removal HbO₂ changes from baseline and between odours were compared using ANOVA and post-hoc analysis.

Results We found no S1 activation following any odour. MBO (and not CC) induced an increase bilaterally in the OFG ($p > 0,001$).

MBO as compared to CC elicited a higher increase ($p < 0,05$) in the OFG bilaterally and in the left PFC.

The mean increase of HbO₂ from baseline during the 30 s post stimuli were higher in MBO as compared to CC:

• 3,3 (0,7–5,9) $\mu\text{mol/l}$ vs 0,8 (-1,4–3,0) $\mu\text{mol/l}$ in the left OFG.

• 2,4 (-0,3–5,2) $\mu\text{mol/l}$ vs 1,1 (-1,2–3,4) $\mu\text{mol/l}$ in the right OFG.

Conclusions Newborn infants can detect their MBO at a cortical level and discriminate it from a control smell. As MBO is used in the NICU it is of great interest to further investigate how hospitalised infants react cortically to MBO.

PO-0459 FAT MASS(FM) AND FAT FREE MASS(FFM) INDICES IN PRETERM AND TERM INFANTS DURING FIRST 6 MONTHS OF LIFE

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Background The development of normative reference Body Composition (BC) data in infancy, is an important step towards evaluation of postnatal growth in clinical practice. Weight gain fails to differentiate lean body mass (constitution) from fat mass (nutrition). Percentile ranks and length normalised indices of