

for ROP screening on the basis of birth weight and/ or gestational age. Only the first screening examination for each baby was considered. Premature babies, were randomised to one of three interventions before their screening examination: group 1 (n = 27) received 24% sucrose oral, group 2 (n = 27) received 24% sucrose with pacifier, group 3 (n = 27) received sterile water with pacifier. Pain responses were scored by using the PIPP.

**Results** A total of 81 infants (42 males and 39 females) were enrolled in the study. The mean birth weight was  $1280 \pm 316$  g, gestational age was  $28.7 \pm 2.1$  weeks and corrected gestational age at examination was  $34.2 \pm 2.9$  weeks. The mean PIPP scores in group 1, 2, and 3 were 16.7, 11.4 and 15.1, respectively. Sucrose with pacifier (group 2) had a significantly lower mean PIPP score than group 1 and 3 (p 0.014; 0.021, respectively).

**Conclusions** Sucrose combined with NNS and NNS itself reduce pain scores during screening examinations for ROP.

**PS-195 SUCROSE VERSUS BREASTFEEDING FOR VENIPUNCTURE IN TERM INFANTS. A RANDOMISED, PROSPECTIVE, CONTROLLED STUDY WITH ANALYSIS OF THE SPECIFIC CORTICAL RESPONSE**

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**Background and aims** Sucrose and breast milk during painful procedures are reported to decrease pain behavioural expression in neonates. Recent data showed a persistent cortical pain response while using the sucrose during a painful procedure.

To compare the efficacy of sucrose versus breast milk for specific-pain brain activity relief during a painful procedure in neonates.

**Methods** Randomised, prospective, controlled study. Each term newborn was randomly assigned to sucrose or breastfeeding group at day 3 during a systematic venipuncture. Change in the total haemoglobin concentration in the contralateral somatosensory cortex (Near Infra-red Spectroscopy, NIRS) was assessed 10 seconds before and after the venipuncture. Neonatal Facial Coding System (NFCS) was assessed 2 min before and at the time of the venipuncture. Groups were compared using Wilcoxon test for the variations in NIRS and Chi-square test for the NFCS scores.

**Results** 113 newborns were included (sucrose: 56, breastfeeding: 57) with a mean (sd) of 39.3 weeks (0.9) for gestational age and 3370 g (478) for birth weight. 103 were analysed for the NIRS (sucrose: 55, breastfeeding: 48). Median (quartiles) of total haemoglobin concentration change was  $-8.5 \mu\text{mol/L}$  ( $-34.5$ ;  $12.5$ ) for sucrose group and  $12.3 \mu\text{mol/L}$  ( $-23.4$ ;  $39.3$ ) for breastfeeding group with no statistical difference (p = 0.06). NFCS scores were significantly different with 46.8% with a painful score in the breastfeeding versus 26.8% in the sucrose (p = 0.03).

**Conclusions** No difference were found between sucrose and breastfeeding on specific-pain brain activity during a venipuncture in term newborns. A discordance was revealed between NFCS scores and NIRS analysis.

**PS-196 WITHDRAWN**

**PS-197 A RANDOMISED TRIAL OF ESTIMATING UMBILICAL CATHETER INSERTION DEPTH IN NEWBORNS USING BIRTH WEIGHT OR SURFACE MEASUREMENTS (ISRCTN17864069)**

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**Background** Incorrect umbilical venous and arterial catheter (UAC and UVCs) tip position is associated with increased rate of complications.

**Objective** To determine whether using birth-weight (BW), rather than body surface measurement (M), to estimate ID of UVC and UACs results in more correctly placed catheters.

**Methods** Newborns undergoing UVC and/or UAC insertion were randomised to have ID estimated using BW [UVC:  $\text{cm} = (\text{BW} \times 1.5) + 5$ ; UAC:  $\text{cm} = (\text{BW} \times 3) + 9$ ] or using shoulder to umbilicus measurement (M). The primary outcome was correct catheter tip position on X-ray (UVC T9–T10; UAC T6–T10).

**Results** We enrolled 101 newborns. UVC insertion was successful in 97 (96%). There was no difference in correctly placed UVCs between groups (Table). UAC insertion was attempted in 87 infants and was successful in 62 (71%). More infants in the W group had a catheter tip in the correct position (Table). We found no differences in secondary outcomes.

**Abstract PS-197 Table 1**

UVC	Weight (N = 53)	Weight (N = 53)
T9-T10 <sup>#</sup> n (%)	16/51 (31)	13/46 (28)
Too high (<T9) <sup>#</sup>	11/51 (22)	5/46 (11)
Too low (>T10) <sup>#</sup>	10/51 (20)	20/46 (43)
UAC	Weight (N = 46)	Measure (N = 41)
T6-T10 <sup>#</sup>	29/32 (91)	15/30 (50)
Too high (<T6) <sup>#</sup>	3/32 (9)	0/30 (0)
Too low (<T10) <sup>#</sup>	0/32 (0)	15/30 (50)

**Conclusions** UVCs often cannot be advanced to the estimated ID or are in the portal venous system on X-ray. Estimating UVC ID using BW did not result in more correctly placed UVCs. When successful, estimating UAC ID using BW results in more correctly placed catheters.

**PS-198 TOPICAL GLYCERYL TRINITRATE OINTMENT TO AID UMBILICAL ARTERY CANNULATION IN NEONATES**

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**Background and aims** Umbilical artery cannulation is a common neonatal procedure that is often challenging because umbilical arteries constrict after birth. We aimed to determine whether the topical application of a vasodilating ointment prior to cannulation increases success and decreases the time taken to cannulate.

**Methods** Discarded umbilical cords were collected immediately after delivery and two 3 cm sections proximal to the baby were used for the study. 0.1mL topical Glyceryl Trinitrate (GTN) ointment (0.2% w/w) was applied to the surface of one section for 5 min prior to cannulation, whereas the second section acted as the control. After ointment removal, medical staff blinded to intervention attempted to cannulate one artery in each section.

We assessed cannulation success, time to cannulate, and correct treatment identification for each participant.

**Results** 14 experienced (9 Fellows, 5 Consultants) and 9 junior (Registrars) medical staff attempted 46 cannulations. Experienced participants successfully cannulated 100% of treated and control sections with no significant difference in mean (SD) time to cannulate (98 (75)s and 97(51)s respectively,  $p = 0.97$ ). Junior participants cannulated 89% and 67% of treated and control sections respectively ( $p = 0.69$ ), and mean (SD) time to cannulate was 132 (78)s and 106 (53)s respectively ( $p = 0.42$ ). GTN treated arteries were correctly identified by 43% of experienced and 22% of junior participants ( $p = 0.47$ ).

**Conclusions** This study suggests that topical application of GTN does not increase successful cannulation of umbilical arteries by experienced staff. More participants or prolonged GTN application time may be needed to confirm these findings in junior staff.

**PS-199 IMPROVED IRRADIANCE OF PHOTOTHERAPY DEVICES IN DUTCH NEONATAL INTENSIVE CARE UNITS**

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**Background/aims** Phototherapy (PT) is an effective treatment for hyperbilirubinemia, provided a minimum irradiance level is applied. Previously, we reported on low irradiance levels of PT devices in Dutch Neonatal Intensive Care Units (NICUs). These data were shared with all NICUs. We hypothesised that this knowledge would positively affect current applied irradiance levels. Therefore we determined irradiance levels of PT devices again in 2013.

**Methods** Irradiance levels of overhead and underneath PT devices in all 10 NICUs were measured with a Dale 40 radiometer (FlukeBiomedical, Everett, Washington, USA), in routinely applied PT practice patterns, using an infant silhouette model. The infant's distance from the overhead device was measured.

**Results** Irradiance levels of 35 PT device-incubator combinations were measured (Table); 10 types of PT devices were in use in the 10 NICUs (8 overhead and 2 underneath). Overall irradiance levels increased ( $p = 0.01$ ); irradiance levels of overhead and underneath PT devices also increased with 50% (NS) and 200% ( $p = 0.03$ ), respectively. The mean (range) distance between overhead PT device and infant decreased with 7 cm to 38 (30–62) cm ( $p < 0.01$ ). Minimal recommended irradiance levels of 10  $\mu\text{W}/\text{m}^2/\text{nm}$  were obtained for 70% of PT devices versus ~50% in 2008 ( $p = 0.02$ ).

**Conclusions** Applied irradiance levels of PT devices in Dutch NICUs have markedly improved in 2013. Current data suggest that awareness among healthcare workers regarding requirements for effective PT results in improved use of PT devices, including smaller distances between PT device and infant.

**Abstract PS-199 Table** Median Irradiance levels of PT devices in Dutch NICUs

Median irradiance level ( $\mu\text{W}/\text{cm}^2/\text{nm}$ )	2013	2008 <sup>1</sup>	p-value
All PT devices	14.9 [0.7-41]	9.1 [0.8-32.6]	0.01
Overhead PT devices	14.6 [5.8-41]	9.7 [4.3-32.6]	0.11
Underneath PT devices	20.7 [0.7-27.3]	6.8 [0.8-15.6]	0.03

Moreover, the availability of better performing (Light Emitting Diode) PT devices might have contributed.

**PS-200 HOSPITAL-LEVEL VARIATION IN READMISSION RATES OF NEONATAL INTENSIVE CARE (NICU) PATIENTS: A POTENTIAL QUALITY MEASURE**

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**Background** Variation in readmission rates may assess the quality of a provider through the quality of inpatient care or transitions from inpatient to outpatient providers. The aim of this project was to validate readmission rates as a measure of NICU quality.

**Methods** Using birth certificates linked to maternal and infant hospital discharge records, a cohort was constructed of 23–34 week gestation infants who survived to hospital discharge at a California hospital discharging over 50 such infants per year between 1995–2009 (N = 296,509 at 141 hospitals). Unadjusted variations in hospital readmission rates within 7, 14, 30, 90, and 365 days after discharge were compared to rates adjusted for hospital casemix, including patient gestational age, insurance status, race/ethnicity, and maternal education, and BPD, IVH, NEC, and ROP as measures of chronic health conditions.

**Results** Unadjusted readmission rates varied significantly between hospitals and across geographic regions, ranging from 2.2–28.4% 7–14 days after discharge to 2.7–34.4% 365 days after discharge. Some of this variation was explained by hospital casemix. However, after risk adjustment, there remained a 7.9–11.5 fold difference in readmission rates between hospitals with the lowest and highest rates across the five time frames that did not change when complications of preterm birth were included in the risk-adjustment model.

**Conclusions** There is substantial variation in readmission rates of premature infants that is only partially explained by gestational age and social factors. Readmission rates may provide a measure of the quality of NICU care and the integration of services within a geographic area.

**PS-201 ASSOCIATION BETWEEN BLOOD TRANSFUSION AND DEVELOPMENT OF RETINOPATHY OF PREMATUREITY - SYSTEMATIC REVIEW OF LITERATURE AND META-ANALYSIS**

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**Background and aims** Retinopathy of Prematurity (ROP) is an important cause of visual impairment and blindness in children.<sup>1</sup>

**Aim** Conduct a systematic review and meta-analysis to determine the association between blood transfusion and the development of ROP in preterm infants  $\leq 32$  weeks gestational age or birthweight  $< 1500$  grams.

**Methods**

**Data Sources:** MEDLINE, EMBASE, Cochrane Register, CINAHL, LILACS, Web of Knowledge, clinicaltrial.gov and Open SIGLE.