newborn: 3(30%) prenatally, 4(40%) by physical examination before discharge and 3(30%) after hospital discharge. Since pulseoximetry screening (May 2013), there have been 4 patients (out of 3068 deliveries) with CCHD, all of them diagnosed before hospital discharge (2 prenatally, 2 by physical examination and pulseoximetry). There were 2 false positives (0,06%), one of them was diagnosed of situs inversus totalis, probably related to Kartagener syndrome.

Conclusion Conventional screening for congenital heart disease can lead to a significant rate of unrecognised CCHD. Pulseoximetry may be a useful screening test, false-positive rate was particularly low (<0,1%).

More studies are needed to assess its long-term real value and economic impact in our heath system.

PO-0509 FUNCTIONAL ECHOCARDIOGRAPHY AND MULTISITE TISSUE OXYGENATION MONITORING IN PRETERM INFANTS WITH CLINICAL SEPSIS

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Background Diagnosing circulatory failure in preterm infants with sepsis is challenging. Multisite Near-infrared spectroscopy (NIRS) monitoring and functional echocardiography are non-invasive tools to assess micro- and macro circulation. Our aim was to assess the correlation between both monitoring methods in preterm infants with clinical sepsis.

Methods Prospective exploratory cohort study. We included preterm infants with clinical sepsis. Functional echocardiography was performed twice, once within 48 h of sepsis work-up and once at least 24 h later. We measured cerebral, renal, and intestinal tissue oxygen saturation using NIRS during an hour of stable measurements directly preceding or following echocardiography and calculated fractional tissue oxygen extraction (FTOE) in each tissue. We determined Spearman's correlation coefficients between the FTOE and right ventricular output (RVO), left ventricular output (LVO), superior vena cava flow (SVC-flow), ductus arteriosus flow (DA-flow) and patent foramen ovale flow (PFO-flow).

Results We included 24 infants (median GA=27.7 wks, BW=928g, PNA=11.8d). In seven infants only the first echocardiography was performed. Correlation coefficients between (changes in) NIRS-measurements and (changes in) functional echocardiography measurements are displayed in Table 1.

Abstract PO-0509 Table 1 Association expressed as spearman's p between (deltea) NIRS measurements and (delta) flow measurements

First echo	cFTOE	rFTOE	iFTOE	Changes between echo's	dcFTOE	drFTOE	diFTOE
RVO	-0.014 N=22	0.186 N=22	-0.509 N=11	dRVO	0.181 N=13	0.000 N=12	-0.500 N=8
LVO	-0.167 N=24	0.429* N=24	-0.385 N=13	dLVO	0.332 N=15	0.288 N=14	-0.483 N=9
DA-flow	-0.028 N=24	0.267 N=24	0.309 N=13	dDA-flow	-0.174 N=17	0.197 N=16	0.000 N=11
SVC-flow	-0.207 N=22	0.020 N=22	0.608* N=12	dSVC-flow	-0.227 N=11	0.236 N=11	-0.500 N=8
PFO-flow	0.380 N=20	0.128 N=20	0.091 N=10	dPFO-flow	-0.081 N=12	-0.112 N=12	-0.810* N=8
RVO-PFO	-0.233 N=19	0.156 N=19	-0.700* N=9	dRVO-PFO	0.200 N=11	-0.027 N=11	-0.250 N=7
LVO-DA	-0.184 N=24	0.106 N=24	-0.604* N=13	dLVO-DA	0.514* N=15	0.046 N=14	-0.250 N=9

Conclusion RVO-PFO and LVO-DA flow, indicators of systemic blood flow in preterm infants with shunts, were negatively associated with intestinal FTOE, but not with renal and cerebral FTOE. This indicates that a compromised macro circulation in preterm infants with clinical sepsis is associated with low intestinal but not cerebral or renal perfusion. Furthermore, our results suggest that macro circulatory changes during sepsis do not co-occur with changes in microcirculatory indices in various organs.

PO-0510 INHIBITION OF PENTOSE PHOSPHATE PATHWAY AND NADPH OXIDASE IMPAIRED THE RESPONSE OF CHICKEN DUCTUS ARTERIOSUS TO OXYGEN

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Introduction NADPH derived from the pentose phosphate pathway (PPP) is a key system involved in maintaining the function of several important redox and antioxidant defense mechanisms. NADPH oxidases contain a catalytic NOX subunit that transfers electrons from NADPH to oxygen, thereby forming reactive oxygen species (ROS). Normoxic contraction of the ductus arteriosus (DA), such as occurs at birth, appears to be dependent upon the increase of ROS in DA smooth muscle cells. We hypothesised a role for NOX-derived ROS in the signalling pathway of oxygen-induced contraction of the DA.

Methods We investigated the effects of the inhibition of PPP and NOX in the *ex vivo* response of chicken DA to oxygen. Experiments were performed in myograph-mounted DA rings (pulmonary and aortic sides) isolated from chicken embryos incubated for 19 days (total incubation: 21-d).

Results Exposure to oxygen (21%) induced a sustained contractile response in the pulmonary but relaxation in the aortic side of 19-d DA. Incubation with the PPP inhibitor epiandrosterone or with the NOX inhibitors GKT-136901, VAS2870 and VAS3947 elicited a partial or complete impairment of oxygen-induced contraction. Phenylephrine- and KCl-induced contraction of chicken DA were impaired by epiandrosterone and VAS3947 but not by the other NOX inhibitors. Moreover, VAS3947 evoked an irreversible impairment of the contractility of the vessel. Oxygen-induced relaxation in the aortic part of the DA was not affected by NOX inhibitors.

Conclusions Our data indicate that PPP and NADPH oxidase activation are events involved in the signalling cascade ofnormoxic contraction of chicken DA.

PO-511 WITHDRAWN

PO-0512 MICROVASCULAR CIRCULATORY DYSREGULATION: A NEW PARADIGM FOR CARDIOVASCULAR COMPROMISE IN THE PRETERM NEWBORN

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Background and aims Cardiovascular compromise is associated with poor outcome in the preterm neonate, with gestational age and male sex as independent risk factors for hypotension, developmental injury and death. Recent work has highlighted the microvasculature as important in the development of cardiovascular compromise in the preterm. We aimed to further characterise microvascular changes that occur in the preterm newborn, identify potential windows for therapeutic intervention and explore the mechanisms underlying this dysfunction.

Methods Preterm neonates were studied during circulatory transition. Microvascular blood flow was characterised over time by laser Doppler. We developed a guinea pig model for studying the mechanisms underlying regulation of blood flow (delivery at GA62/71) and also undertook studies in the preterm piglet.

Results We observed significantly different patterns of microvascular tone regulation between male and female human ($p = 0.01$) and guinea pig ($p = 0.01$) neonates. Overproduction of vasodilators (carbon monoxide $r = 0.495$; $p < 0.001$; hydrogen sulphide $r = 0.37$, $p = 0.0004$), and decreased sympathetic nervous activity ($r = 0.424$, $p = 0.025$) was associated with increased microvascular flow. We were additionally able to characterise aspects of this physiology in the preterm piglet.

Conclusions We propose a paradigm shift whereby inherent physiological differences between the preterm and term, and male and female, lead to inappropriate dilatation of the microvasculature, insufficient preload to the struggling myocardium and functional hypovolaemia, thus resulting in central hypotension and cardiovascular compromise. We now have evidence of many of the mechanisms underlying this dysregulation and propose future research be directed at interventional opportunities.

PO-0512a FEASIBILITY STUDY OF PULSE OXIMETRY SCREENING FOR CRITICAL CONGENITAL HEART DEFECTS AFTER HOMEBIRTHS IN THE NETHERLANDS

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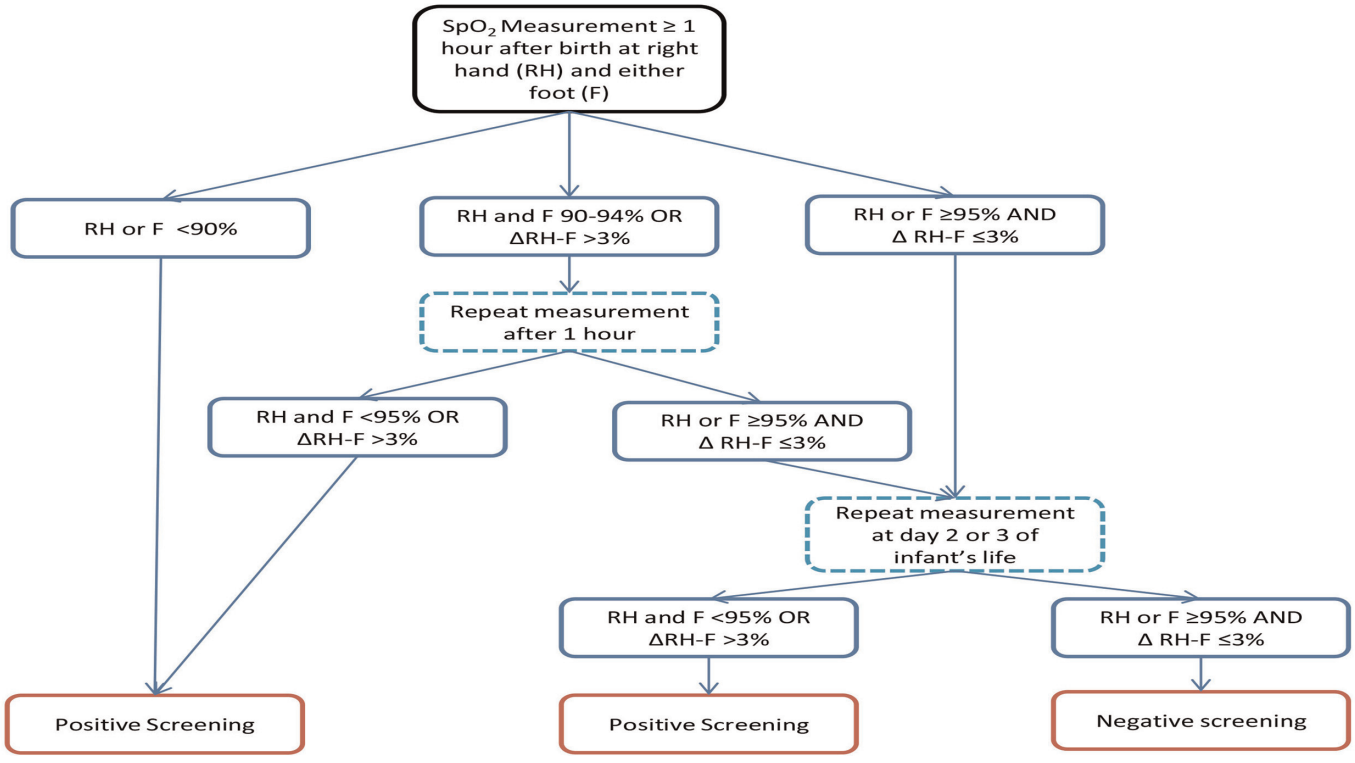
Background and aims Studies have shown evidence for universal neonatal screening for critical congenital heart defects (CCHD) with pulse oximetry (PO). However, the feasibility of CCHD screening after homebirth is unknown. We assess the feasibility of PO screening in the Netherlands, where there is a high percentage of homebirths and early discharge after uncomplicated delivery in hospital. Preliminary results of the first 6 months are given.

Methods Since October 2013 a feasibility study is performed in the Leiden region. Pre and post ductal SpO_2 are measured ≥1 h after birth in term low-risk infants using Nellcor PO. The measurement is repeated at day 2 or 3. Infants with positive screenings are assessed at the paediatric department and echocardiography is performed in case of persistent abnormal SpO_2 readings.

Preliminary results In the study period 1417 infants were born in the Leiden region. Parents of 1093 infants consented for screening and 96% of all infants with parental consent were screened. Inclusion rate increased over time. In 13 infants screening was positive, of which 4 were not recognised and not referred. In 9 positive referred screenings, we detected 1 persistent pulmonary hypertension, 1 muscular ventricular septum defect, 1 patent ductus, 3 infants received sepsis therapy and in



Abstract PO-0512a Figure 1