Case presentation: We report a case of a preterm infant (26 weeks GA) presenting with recurrent pulmonary hemorrhage in whom we performed a therapeutic lavage with diluted surfactant after an acute episode of massive bleeding with severe intractable hypoxemia. Repeated small aliquots of diluted surfactant (10 x 2 ml) allowed for marked improvement in oxygenation allowing to reduce mean airway pressures during high frequency oscillatory ventilation rapidly. The infant showed further progressive improvement allowing switching from HFOV back to conventional ventilation and finally extubation within 25 days.

Conclusion: Bronchoalveolar lavage with diluted surfactant might be beneficial in massive pulmonary hemorrhage in infants. Further investigations are needed to clarify the potential benefit of such a therapeutic intervention on outcome of infants suffering from life-threatening PH.

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DIFFERENT GAS FLOW RATES AND EFFECTS ON TIDAL VOLUME AND MASK LEAK DURING POSITIVE PRESSURE VENTILATION

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Aim: Observing the effects of changing gas flow rates during positive pressure ventilation (PPV) on Peak Inflating Pressure (PIP), Positive End Expiratory Pressure (PEEP), expiratory tidal volume (V_{Te}) and mask leak.

Methods: Twenty neonatal staff members of The Royal Women's Hospital were asked to deliver PPV to a modified manikin. *Experiment 1:* PPV was delivered for four minutes continuously with a set PIP 30 cm H₂O and PEEP 5 cm H₂O. Each minute the gas flow rate was increased from 5 to 8, 10, and 15 L/min. Neither PIP nor PEEP was adjusted

during PPV. The same initial settings were used in *experiment 2*. However, PIP and PEEP were readjusted after each gas flow rate change.

Results: Results are given in median (IQR).

Experiment 1: with gas flow rate increments of 5, 8, 10 and 15 L/min the V_{Te} decreased significantly from 10.0 (8.5-11.4), 6.3 (3.9-7.4), 3.4 (0.7-5.4) to 0.8 (0-1.7) mL/kg, ($p=0,000$). Mask leak increased from 14 (5-47)%, 46 (20-79)%, 79 (39-98)% to 98 (91-100)%, ($p=0,000$).

PIP showed a slight increase with the increasing gas flow rates to 35.6 (33.7-37.0) cm H₂O at 15 L/min. PEEP increased significantly to 26.4 (24.5-27.4) cm H₂O at 15 L/min.

Experiment 2: There was no significant difference in delivered V_{Te} ($p=0.42$) or mask leak ($p=0.51$) with changing gas flow rates.

Conclusion: Changing gas flow rates during PPV effected V_{Te} delivery, mask leak and airway pressures. It is therefore advisable not to alter the gas flow rate during resuscitation.

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RETINOPATHY OF PREMATURE SCREENING AND STRESS IN PRETERM INFANTS

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Aims: Retinopathy of Prematurity screening of the preterm infant is potentially a stressful procedure. In this study, we attempted to quantify the degree of stress caused by this examination using the Med-Storm Pain Monitor (Advantech). This monitor measures the changes in skin conductance secondary to sweat released by sympathetic neuron firing using electrodes placed on the skin. Each firing of the neurons is followed by a conductance peak. The monitor records the rate of firing of the neurons per second.

Methods: Preterm infants undergoing ROP screening had skin conductance rates measured using the Med-Storm Pain Monitor. Each infant's skin conductance rate was measured using electrodes applied to the sole of the foot. The conductance rates were measured at baseline

prior to the procedure and subsequently throughout the ROP examination, which on average lasted 2 minutes. The results were documented on an Excel spreadsheet and analysed using the paired T-test.

Results: A total of 19 infants were studied. The skin conductance peak rate (mean) was 0.017 peaks/s at baseline and was 0.14 peaks/s during the procedure ($p < 0.001$).

Conclusion: The findings indicate that ROP screening causes a degree of stress to preterm infants. The Med-Storm Pain Monitor permits the quantification of the degree of stress encountered by the infant. This technology offers the potential of being able to identify and modify the distress caused by neonatal procedures.

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COMPLICATIONS IN THE NEAR TERM AND TERM INFANTS WITH SEVERE UMBILICAL ARTERY ACIDEMIA

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Background and aims: Umbilical artery acid-base status is a useful marker of the fetal condition just before birth. The objective of our study was to determine the newborn complications in near term and term infants associated with umbilical artery acidemia of pH ≤ 7.10 .

Study design: We retrospectively reviewed the maternal and neonatal records of infant's ≥ 35 weeks, born between March 2007 and February 2010, with umbilical artery blood pH ≤ 7.10 . Umbilical artery acidemia was classified as metabolic, respiratory and mixed.

Results: 179 babies had an umbilical artery pH of ≤ 7.10 , of which 59 had an umbilical artery pH < 7.00 and 120 had pH between 7.00 - 7.10. Overall 129 (72%) babies showed evidence of fetal distress; 82(45%) underwent emergency caesarean section, 41(22%) underwent instrumental vaginal delivery. Table below describes the neonatal complications in the two groups.

Complications	pH < 7 (n = 59)	pH 7.00 - 7.10 (n=120)
Mixed or metabolic acidosis	57(97%)	43(36%)
Admission to NICU	38(64%)	11(9%)
Clinical seizures (median onset 8 hours)	20(34%)	2(1.6%)
HIE(moderate/severe)	22(37%)	2(1.6%)
Cerebral function monitoring abnormalities	16(27%)	2(1.6%)

[Umbilical cord acidosis and neonatal outcomes]

Conclusion: The risk of moderate or severe hypoxic ischemic encephalopathy and neonatal seizures is high if umbilical artery pH is < 7.00 along with presence of mixed or metabolic acidosis . Hence these babies should have cerebral function monitoring at least for the first 24 hours.

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INCIDENCE OF HYPOTHERMIA IN LOW BIRTH WEIGHT INFANTS ADMITTED TO THE NEONATAL INTENSIVE CARE UNIT BETWEEN 2002 AND 2009

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Background: Not all LBW infants require admission to the SCBU. Hypothermia ($< 36.5^{\circ}\text{C}$) in premature infants may necessitate admission to SCBU. This interferes with mother-infant bonding and breast-feeding. LBW infants are particularly at risk of hypothermia because of larger surface-area-to-weight ratio, reduced subcutaneous fat and impaired metabolic compensation. This study examines the incidence of hypothermia in moderately low birth weight (LBW) infants.

Aims: To document the incidence of hypothermia on admission in moderately LBW infants between 1800 - 2500 grams admitted to the Neonatal Unit of the Rotunda Hospital between 2002 and 2009 and compare it to the hypothermia rate in larger babies.