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Introduction Guidelines on neonatal cardiorespiratory resuscitation (CPR) suggest the provision of coordinated compressions to inflations at a rate of 3:1. However, manikin studies, and human trials have shown that coordinated chest compression/manual ventilation is difficult to achieve. In a manikin study, we aimed to investigate how music might help to control CPR in neonates.

Methods 36 medical professionals were trained in neonatal resuscitation with and without listening to music (Radetzky-Marsch). CPR was performed using a neonatal lung model and a T-piece resuscitator for manual ventilation. Chest compressions were counted using a mechanical tally counter and the rate of inflations were recorded using a respiratory monitor.

Results A total of 2514 inflations and 7678 chest compressions were analysed, with a median (interquartile range, IQR) number of chest compressions of 213 (196–229) and 70 (66–76) inflations per participant. Without music the median (IQR) rate of chest compressions was 115 (100–129)/min and the rate of inflations was 38 (32–42)/min. While listening to the Radetzky-Marsch the rate of chest compressions decreased significantly to 96 (96–100)/min ($p=0.002$) and the rate of inflations decreased to 32 (30–34)/min ($p=0.001$). Furthermore, with music the IQR of chest compression rate decreased by 86% and the IQR inflation rate by 60%.

Conclusion A musical mnemonic has a significant impact on the delivery of neonatal CPR. Listening to music optimizes the rate of chest compressions and inflations and reduces the variability between individuals.

1778 PREDICTING FAILURE OF THE INTUBATION-SURFACTANT-EXTUBATION PROCEDURE IN VERY PRETERM INFANTS

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Background and Aims Respiratory Distress Syndrome can be treated with the INTubation-SURfactant-Extubation procedure (INSURE). INSURE-failure, with the need for re-intubation and mechanical ventilation, is common. We studied predictors of INSURE-failure to identify high-risk neonates that may benefit from staying intubated and mechanically ventilated after surfactant.

Methods We studied 363 very preterm infants (< 32 weeks) born 1998–2010 and treated with surfactant. Data were systematically retrieved from their medical records. We defined INSURE as extubation within 2 hours of intubation, and INSURE-failure as re-intubation within 72 hours.

Results Currently 219 of these 363 patients have been assessed; 96 were treated with INSURE (Table) and 123 needed prolonged mechanical ventilation. Newborns treated with INSURE had a median gestational age of 29 weeks and a median birth weight of 1158g.

Abstract 1777 Table 1

Risk factors for INSURE-failure, no. (%) and odds ratios

Risk factors	INSURE-success (n=74)	INSURE-failure (n=22)	Odds Ratio (Unadjusted)
Gestational age <28 weeks	22 (29.7)	13 (59.1)	3.4 (1.3–9.1)
Birth weight <1000g	25 (33.8)	9 (40.9)	1.4 (0.5–3.6)
5 min. APGAR <10	27 (36.5)	13 (61.9)	2.8 (1.1–7.7)
No antenatal steroids	6 (8.1)	3 (14.3)	1.9 (0.4–8.3)
Surfactant in delivery room vs. NICU ^a	7 (9.5)	5 (22.7)	2.8 (0.8–10.0)

^a Neonatal Intensive Care Unit

Conclusion These preliminary results suggest an increased risk of INSURE-failure in infants with a gestational age < 28 weeks, 5 minutes APGAR < 10, and surfactant administration in the delivery room. Keeping these newborns intubated after surfactant may prevent a high-risk re-intubation.

1779 CELL DEATH GENES ARE INDUCED IMMEDIATELY AFTER HYPOXIA-REOXYGENATION (HR) IN THE NEWBORN MOUSE LUNG

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Background and Aims HR-injury can induce generation of reactive oxygen species which activate anti-/pro-apoptotic signalling in the cell or cause direct cell damage. The lungs of newborn neonates are susceptible to HR-injury. To explore underlying mechanisms, a temporal profile of *a priori* selected genes was performed.

Methods 84 C57BL/6 mice postnatal day 7 were randomized to 120 min of hypoxia (FiO₂ 0.08, n=64) or 180 min in air (C21, n=20). The hypoxia group was further randomized to 30 min reoxygenation with FiO₂ 0.60 (H60) or air (H₂1). Lung tissue was harvested after observation in air for 0, 150, 300 min or 3 days and 44 mRNA transcripts were analyzed by real-time PCR.

Results *Bcl2*, *Bcl2l1*, *Bnip3* and *Gadd45g* were significantly up-regulated ($p<0.05$), and *Ccnd1*, *Chek1* and *Casp3* down-regulated in H60vsC21 and H₂1vsC21 (0 min). *Apex1* and *Apaf1* were also down-regulated in the comparison H60vsC21. After 150 min *Apex1*, *Bcl2*, *Casp3*, *Ccnd1*, *Chek1* and *Mutyh* were down-regulated for H60vsC21 and H₂1vsC21. *Bcl2* continued to be down-regulated in both comparisons (300 min). *Gadd45g* was only up-regulated in H60vsC21 after 150 and 300 min. No significant gene expression changes were observed after 3 days.

Conclusion HR-injury in the newborn lung induces an immediate alteration in the expression of both anti- (*Bcl2*, *Bcl2l1*) and pro-apoptotic genes (*Bnip3*, *Apaf1*, *Apex1*, *Gadd45g*), while cell-cycle genes (*Ccnd1*, *Chek1*) are suppressed. A suppression of *Bcl2* from 150 min and a continuous up-regulation of *Gadd45g* after hyperoxic reoxygenation may indicate early phase of DNA damage-induced apoptosis.

1780 EFFECT OF NASAL SYNCHRONIZED INTERMITTENT MANDATORY VENTILATION VERSUS NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE IN REDUCING REINTUBATION OF EXTUBATED PRETERM INFANTS

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Background Nasal flow-synchronized intermittent mandatory ventilation (NSIMV) is a new non-invasive ventilatory mode that delivers synchronized mechanical breaths through the nasal tube.

This study was conducted to compare the efficacy of NSIMV and NCPAP (nasal continuous positive airway pressure) in reducing reintubation of extubated preterm infants.

Methods This randomized clinical trial was conducted in Ghaem NICU of mass had medical university from September 2009 through June 2010.

Preterm infants who had respiratory distress syndrome and required endotracheal intubation within 48h of birth and met specific predetermined criteria for extubation by day 30 of life were recruited. Each infant was randomized to receive either NSIMV or NCPAP soon after extubation. Extubation was deemed successful if

re-intubation was not needed for at least 48h. Brain sonography was done before extubation and after 48h. Sample size was determined with 95% confidence and 90% power. Data was analyzed with spss 11.5 and *Chi-square* test.

Results There were no significant differences in clinical characteristics between the two groups at randomization.

Fifty-four percent (14/25) infants were successfully extubated to NSIMV compared with 52% (13/25) to NCPAP ($p=0.78$). Infants assigned to NCPAP had higher arterial CO_2 pressure level than those assigned to NSIMV ($p=0.002$).

Neither procedure induced major adverse effects despite more elevation in IVH grade during SIMV.

Conclusions NSIMV in the post-extubation period is safe, however it's not more effective than NCPAP in preventing re-ventilation.

1781 THE PREDICTIVE FACTORS IN THE PROGRESS OF TRANSIENT TACHYPNEA OF THE NEWBORN

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Aim To determine the clinical risk factors to predict the progress of TTN in late-preterm and term infants.

Methods The infants with the diagnosis of TTN were evaluated retrospectively. Patients were divided into two groups according to the intensity of respiratory support. Group-1 received any ventilatory support, where group-2 only oxygen. Clinical findings, Richardson and Silverman scores were compared.

Results One-hundred-six (19.1%) infants were evaluated (68 in group-1, 38 in group-2). Mean gestational age and birth weight were lower in group-2. The C/S and male gender rates were similar. Richardson scores, Silverman scores, peak-respiratory rates (pRR) and oxygen need (FiO_2) in the first 24-hours were higher, duration of respiratory support and hospitalization were longer in group-1. The cut-off for Richardson score was 3, and patients whose score higher than 3 had a 6.98-fold-risk, the cut-off for Silverman score was 5 and whose score higher than 5 had a 7.46-fold risk, and the cut-off for pRR in first 24-hours was 75/min and whose pRR was higher than 75/min in first 24-hours had a 1.10-fold risk of receiving ventilatory support (95%CI: 2.30–21.18, 2.54–21.89, and 1.035–1.17, $p<0.01$, respectively).

Conclusions TTN, is usually a benign and self-limited disease and the prognosis is generally excellent. Assessment of Richardson score, Silverman score, and pRR in first 24-hours of patients may be useful in predicting clinical course of TTN. So by predicting of the intensity of ventilatory support in the patients, it is important to plan and provide the appropriate level of care for these infants.

1782 ENDOTRACHEAL TUBE POSITION IN VENTILATED NEONATES - DOES EVIDENCE INFLUENCE PRACTICE?

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Background Malpositioned endotracheal tubes (ETT) in ventilated neonates are associated with adverse pulmonary outcomes including unequal surfactant delivery, asymmetric lung expansion and air-leaks.¹ Use of gestation age (GA) based guideline to determine the ETT length at lips resulted in reduction of the need for ETT repositioning from 53% to 8%.² This guideline is recommended by ILCOR.³

Aim To assess adherence to guidelines and need for ETT repositioning.

Methods Ventilated neonates < 24 hours of age, transferred by a regional transfer service during study periods of January to March (3-months) in the years 2008 (pre-publication²) and 2011 (post-publication²) were included. Demographic data, ETT size, length at upper-lip, position on chest X-ray and need for repositioning were collected.

Results Similar proportion of ETT's were repositioned during 2008 and 2011 (30% vs 37%, $p=0.59$). During both periods the proportion of ETT's repositioned were significantly higher ($p<0.05$) with greater deviation of ET length insertion from the guideline:

Inserted ETT length	Need for repositioning (2008)	Need for repositioning (2011)
ETT at recommended length	3/15(20%)	3/20(15%)
ETT +/-0.5cm deviation from guideline	9/36(25%)	7/21(33%)
ETT >0.5cm deviation from guideline	9/15(60%)	16/29(55%)

Conclusion Adherence to guideline is associated with significant reduction in need for ETT repositioning. Publication of guideline has had limited effect. There is need for improving dissemination of evidence based guidelines to improve outcomes.

1. Thayyil et al. *Am J Perinatol* 2008.
2. Kempley et al. *Resuscitation* 2008.
3. Richmond et al. *Resuscitation* 2010.

1783 HOW SAFE ARE DELIVERY ROOM MANEGEMENTS TO PREVENT EARLY HYPOCARBIA?

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Background and Aim Clinically determining appropriate respiratory support from the point of delivery to the NICU is difficult and inadvertent overventilation may be common. The aim of the study was to determine whether delivery room managements done by skilled team will produce 'normocarbic' blood gas values in <29 weeks' preterm infants.

Method A prospective cohort study was designed and infants born before 29 weeks from January 2009 to December 2011 were enrolled. All infants received 100 mg/kg prophylactic surfactant in delivery room. During resuscitation, stabilization, surfactant administration and transport infants were ventilated with a T-piece resuscitator. If respiratory drive was present, infants were extubated to nasal CPAP through short binasal prong. FiO_2 was adjusted to achieve SaO_2 of 88–92% which was monitored by pulse oxymeter. Carbon dioxide (CO_2) levels on admission and early NICU hours (0–6 hours) were evaluated.

Results Fifty nine infants were included with a mean gestation age of 26.2 ± 1.7 (23–28.6) weeks and a birth weight of 857 ± 237 (400–1470). The mean pCO_2 levels of the first blood gas analysis was 45.3 ± 9.8 (range 30.4–71.2). Four (6.8%) infants had hypocarbia ($\text{pCO}_2 < 35$ mmHg).

Conclusion To prevent both hyperoxia and hypocarbia from the point of delivery to the NICU is a challenge. More caution is required to prevent hypocarbia and hyperoxia.

1784 RESPIRATORY MORBIDITY IN TERM INFANTS DELIVERED BY ELECTIVE CAESAREAN SECTION: COHORT STUDY

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