¹SK Dold, ¹M Kelm, ^{2,3}G Schmölzer, ⁴J Dawson, ⁴PG Davis, ¹G Schmalisch, ¹CC Roehr. ¹Dept. Neonatology, Charité Universitätsmedizin Berlin, Berlin, Germany; ²Division of Neonatology, Department of Pediatrics, Medical University Graz, Graz, Austria; ³Department of Newborn Medicine, Royal Alexandra Hospital, Edmonton, AB, Canada; ⁴Dept. Neonatal Medicine, The Royal Women's Hospital, Melbourne, VIC, Australia

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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N Brix, A Sellmer, MS Jensen, TB Henriksen. *Perinatal Epidemiology Research Unit, Department of Paediatrics, Aarhus University Hospital, Aarhus, Denmark*

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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^{1,2}EJ Wollen, ^{1,2}AGW Rognlien, ^{2,3}M Atneosen-Åsegg, ¹MS Wright, ⁴M Bjørås, ^{1,2}OD Saugstad. ¹Department of Pediatric Research, Oslo University Hospital HF; ²Women and Children's Division, University of Oslo, Oslo; ³Department of Clinical Molecular Biology and Laboratory Sciences, Akershus University Hospital, Lørenskog; ⁴Department of Microbiology, Oslo University Hospital HF, Oslo, Norway

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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R Saeedi, S Rahmani, S Norizade. *Mashhad University of Medical Sciences, Mashhad, Iran*

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