Abstract PO-0770 Table 1

		Vte (mL/kg)	CO_2 (mmHg)	RC change per breath/inflation (AU/kg)	AB change per breath/inflation (AU/kg)
SI (median (IQR))		5.1 (1.0–10.4)	10 (2–19)	6 (-73–114)	47 (1–146)
	Inflations only	4.2 (2.3–8.7)	2 (2–6)	6 (-15–41)	46 (19–100)
PPV (median (IQR))	Inflations coinciding with breathing	6.9 (5.2–9.8)	18 (12–24)	4 (-41–45)	24 (-9–102)
Breathing (median (IQR))		5.7 (2.4–8.9)	20 (9–32)	-7 (-57–38)	97 (23–221)
p-value		ns	<0.0001	0.003	<0.0001

Results 42 patients (21 PSV+VG, 21 SIMV+VG) were enrolled. Median GA were 29 weeks and BW were 980,0 and 870,0 gr in each group. Demographic characteristics were similar. 'Appropriate TV' was higher in PSV+VG group. PIP, MAP and FiO_2 were similar in two groups. Hypocarbia, hypercarbia, hyperoxemia and hypoxemia incidences were not different. PSV +VG group were less tachycardic than SIMV+VG group. Acute and chronic prematurity problems including chronic lung disease (CLD) defined as oxygen requirement at 36th GA were not different.
Conclusion PSV+VG was associated with higher 'appropriate TV' without any adverse effects and similar CLD occurence. These findings can support the beneficial use of PSV+VG which is more physiologic due to better inspiratory – expiratory synchrony.

PO-0769 THE PRETERM PIG AS A MODEL FOR ACUTE LUNG DISEASE

[1]M van der Merwe, [2]AF Caminita, [1]B Hance, [1]KK Buddington, [1]RK Buddington. *[1]Health and Sport Sciences, University of Memphis, Memphis, USA; [2]Draeger Medical Inc, Draeger Medical Inc, Telford, USA*

10.1136/archdischild-2014-307384.1408

Background and aims Despite advances in ventilation support, acute lung disease (ALD) remains the leading cause of morbidity, mortality, and disability after preterm birth. There is a need for a spontaneous translational model of ALD after preterm birth.
Methods Preterm pigs delivered at gestation days (GD) 98, 100, 102, and 104 days were provided ventilation support using supplemental oxygen (NC), bubble Continuous Positive Airway Pressure (bCPAP; 7–8 cm H_2O), or mechanical ventilation (MV; Pressure Control Ventilation with Volume Guarantee; 5 ml/kg; PEEP 5 cm H_2O). Monitoring included pulse oximetry, arterial blood gases, and radiography. Lungs were harvested after 24 h or after premature death for histology and measurements of surfactant protein B, phosphatidylcholine, and cytokines.
Results All pigs breathed spontaneously. Lungs at GD 98 and 100 were consolidated with immature alveolar architecture, minimal surfactant protein B expression, and MV was essential for 24 h survival. GD 102 pigs had alveoli lined by pneumocytes and surfactant was released in response to MV. Blood gases and radiography for NC and bCPAP pigs 1–2 h after delivery revealed limited recruitment and mortality at 24 h was 66% (35/53) and 69% (9/13), respectively. GD 104 pigs had higher densities of thin walled alveoli that secreted surfactant and MV was not essential.
Conclusions Preterm pigs have developmental changes in ventilation inadequacies that mimic those of preterm infants and represent a spontaneous model of ALD that is clinically relevant, compatible with standards of chronic neonatal intensive care, and is an alternative for nonhuman primates and lambs.

PO-0770 RESPIRATORY INDUCTANCE PLETHYSMOGRAPHY AND EXPIRED CO2 LEVELS OF PRETERM INFANTS AT BIRTH

[1]J van Vonderen, [2]G Lista, [2]F Cavigioli, [3]SB Hooper, [1]AB te Pas. *[1]Neonatology, Leiden University Medical Center, Leiden, Netherlands; [2]Neonatology, v. Buzzi Children's Hospital ICP, Milan, Italy; [3]The Ritchie Center, Monash Institute of Medical Research, Melbourne, Australia*

10.1136/archdischild-2014-307384.1409

Background Preterm newborns often need respiratory support for lung liquid clearance and aeration. Previous studies provided tidal volumes during positive pressure ventilation (PPV) and breathing, but very little is known how efficient these are in lung recruitment and gas exchange. Aim was to measure tidal volume, functional residual capacity (FRC) changes and gas exchange during respiratory support in preterm infants at birth.
Methods In preterm newborns needing respiratory support the following measurements were performed: 1) expired tidal volumes (Vte (mL/kg)) using respiratory function monitoring, 2) changes in FRC (AU/kg) per breath using Respiratory Inductance Plethysmography (bands placed around the rib cage (RC) and abdomen (AB)), 3) expired CO_2 using a volumetric CO_2 monitor. For respiratory support a T-piece resuscitator and mask were used with PIP 25 cm H_2O and PEEP 5 cm H_2O. Data was analysed during sustained inflation (SI), the first 30s of PPV and breathing on CPAP.
Results 15 infants were included (median (IQR) gestational age 28 (27–31) weeks, birth weight 1080 (994–1300) grams). There was no difference in Vte between SI, PPV and breathing (table). Gas exchange was more efficient during breathing and inflations coinciding with breathing compared to SI and inflations only (table). Little change occurred during the SI, PPV and breathing measured at the RC. In contrast, there was FRC gain at the AB during the SI, PPV and most with breathing.
Conclusions While tidal volumes during PPV and breathing were similar, breathing was more effective in gas exchange and caused more gain in FRC than PPV.

PO-0771 THE EFFECT OF EXOGENOUS SURFACTANT THERAPY ON LUNG MECHANICS IN VERY PRETERM INFANTS

F Yavanoglu Atay, O Bozkurt, G Kutman, FE Canpolat, SUNA Oguz, N Uras, U Dilmen. *Neonatology, Zekai Tahir Burak Women Health Care Education and Research Hospital, Ankara, Turkey*

10.1136/archdischild-2014-307384.1410

Introduction and aim Surfactant replacement is a corner stone therapy for respiratory distress syndrome (RDS) and has been shown to be both safe and efficacious for premature infants. The aim of this study was to assess the immediate changes in lung mechanics caused by administration of two different natural surfactants. Secondary aim of this study was to determine the