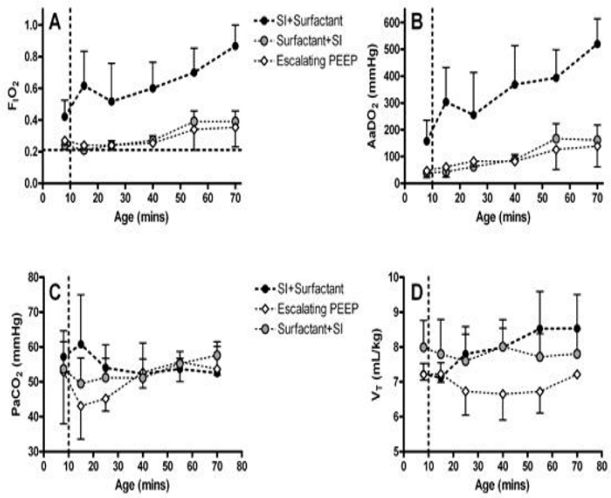
Conclusions: Exploring the interaction between type of recruitment manoeuvre and adjunctive therapies birth using methods which may be translatable to the clinical environment is feasible and may yield interesting results.

Figure 1. Influence of three different recruitment strategies at birth on FIO2 (**A**), $AaDO_2$ (**B**), $PaCO_2$ (**C**) and V_T (**D**)



[Figure 1]

1330

CAN NON-INVASIVE VENTILATION BE AN ALTERNATIVE TO MANAGE RESPIRATORY FAILURE IN CHILDREN WITH MODERATE TO SEVERE NEUROLOGICAL IMPAIRMENT?

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Background & aims: Invasive ventilation for respiratory failure in children

with moderate to severe neurological impairment is complex. We report the experience of non-invasive ventilation in these patients having moderate to severe neurological impairment in a 6 bedded paediatric critical care unit.

Methods: We retrospectively analysed a database of all children admitted unit at over a 33month period. We analysed the sub-group of children with moderate to severe neurological impairment who were ventilated, either invasively or non-invasively.

Results: Over the study period, of 362 (32.8%) who required ventilatory support, 92 were classed as having moderate to severe neurological impairment. Demographic details are shown in Table.

Of the patients receiving both non-invasive and invasive ventilation, 6 failed with NIV, requiring invasive ventilation, while in 3 others received NIV post-extubation.

There was no significant difference between the groups in terms of length of stay (p=0.112) or survival (p=0.98).

Conclusions: NIV is a safe mode to support children with moderateto severe neurological deficit.

	NIV exclusive	IV exclusive	Mixed IV/NIV	Total
Total patients	30	51	11	92
"Age [yrs] Median (IQR)"	5.40 (1.73-6.86)	5.54 (2.85-10.42)	4.93 (3.44-9.41)	5.54 (2.27-9.49)
Sex M:F	15:15	22:29	6:5	43:49
"Days ventilated Median (IQR)"	1.5 (0.25-4.75)	1 (1-2.5)	6 (1-8)	1 (1-4)
"Length of stay Median (IQR)"	2 (1-6.75)	2 (1-11.08)	4 (1-6)	2 (1-6)]
Readmitted (%)	4 (13.3)	7 (13.7)	2 (18.2)	13 (14.1)
"Survived (% of total patients)"	28 (93.3)	50 (98.0)	10 (90.9)	88 (95.7)
"PIM2 predicted mortality (%) Median(IQR)"	1.08 (0.70-1.31)	3.20 (1.28-5.54)	1.15 (0.98-3.39)	1.59 (1.1-3.71)

[Demographic Patient Profile]

1331

A COMPARISON OF DIFFERENT BEDSIDE TECHNIQUES OF DETERMINING ENDOTRACHEAL TUBE MALPOSITION

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Background: Endotracheal tube (ETT) malposition is common but rapid identification of exact position of the tube is difficult at the bedside.

Aim: To compare six different potential bedside indicators of ETT malposition in a piglet model of neonatal lung injury.

Methods: Six anaesthetised and muscle-relaxed piglets with saline lavaged surfactant-deficient lungs ($AaDO_2$ >350mmHg in F_{IO2} 1.0) conventionally ventilated were studied. Transient periods (30-120s) of ventilation with the ETT place in the oesophagus and a single main bronchus (MB) were compared with an appropriately placed ETT. During each period, colorimetric end-tidal CO_2 (Pedi-Cap®), flow at the airway opening (Florian), global/regional lung volume and tidal ventilation (electrical impedance tomography; EIT), Sp_{O2} and heart rate were continuously measured.

Results: Compared to ventilation via a correct placed ETT; *Oesophageal ventilation*: Sp_{O2} decreased from 96% to 74%, without heart rate change. Pedi-Cap® demonstrated absence of tidal color change, and no expired tidal volume was seen on the Florian. EIT confirmed absence of any lung inflation.

MB ventilation: There was no significant difference between the Sp_{O2}, heart rate, Pedi-Cap® and peak inspiratory/expiratory tidal flows, EIT demonstrated a significant change in tidal volume ventilation with 97% occurring in the ventilated lung and 3% in the unventilated lung.

Conclusion: The Pedi-Cap and RFM were able to distinguish between endotracheal and oesophageal ventilation. EIT alone correctly identified all adverse events and might have a role in bedside monitoring of ventilated infants.

1332

EFFECT OF SURFACTANT AND PARTIAL LIQUID VENTILATION TREATMENT ON CEREBRAL HAEMODYNAMIC AND OXIGENATION IN PREMATURE LAMBS

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Background: Surfactant (SF) therapy in RDS has reduced mortality and morbidity in preterm infants. Although adverse-effects seem to be moderate, fluctuation in cerebral circulation has been observed. Cerebral haemodynamic changes during partial-liquid-ventilation (PLV) have not been well described.

Aim: To evaluate the effect of SF and PLV treatment on oxygenation and on cerebral haemodynamic in premature lambs with RDS.

Methods: 18 preterm lambs (80-90%GE) were randomly assigned to: SF-Group, received Curosurf®(175mg/kg), PLV-Group, treated with perfluorocarbon(30ml/kg) or Control-Group. Systemic-arterial-pressure (SAP), heart rate(HR), oxygenation-index (OI) and arterial/alveolar-index (a/ADO_2) were determined during 3hours. Regional-cerebral-blood-flow (RCBF) was determined by microspheres-technique at foetal point (F), 1h and at 3h. Cerebral cortexes and periventicular zones (striatum, thalamus, hypothalamus, hippocampus) were grouped. Mean±SEM;Two-factor-ANOVA,p< 0.05

Results: Fetal blood gases were similar between groups (pH:7.30±0.07, $PaCO_2$:47±9mmHg, PaO_2:27±6mmHg). After 5-min of conventional-mecanical-ventilation a severe RDS was developed in all groups (IO>70, a/ADO2< 0.1), that was maintained stable in Control-Group throughout the experiment. SF and PLV treatments showed significant improvement of gas exchange (IO:6±2 and a/ADO_2:0.38±0.05, at1h). However, only SF treatment sustained this improvement along the time. HR and SAP remained stable.

	CORTEX (F)	PERIVENTRICULAR (F)	CORTEX (1 HOUR)	PERIVENTRICULLAR (1H)	CORTEX (3H)	PERIVENTRICULAR (3H)
CONTROL			98±13	156±30	102±9	158±15
PLV	135±8	204±18	102±17	178±30	167±23 #	305±46
SF			67±10	89±8	68±36 %	65±13#%

[RCBF (ml/100g/min)]

(#)vs.Control-group;(%)vs.PLV-group;

Conclusion: In SF and PLV treatment careful monitoring of pulmonary and cerebral haemodynamic status and cautious corrections of ventilator settings are mandatory to avoid alterations of RCBF. Supported:GV2007111046-FIS070733