and thrombosis due to blood-material contact. Specifically the
ATH was attached to the PDMS using dopamine as a
‘bio-glue’.

**Materials and methods**
PDMS discs were incubated in a solution of
dopamine hydrochloride and then in ATH solution. A sepa-
rate set of PDMS discs were justed incubated in ATH. Uptake of
ATH and adsorption of antithrombin (AT) from plasma (a mea-
sure of anticoagulant activity) to the various surfaces was mea-
sured using \(^{125}\)I-labelled ATH and AT. Stability of ATH on
surfaces was evaluated by measuring residual radioactivity after
incubation in blood.

**Results**
ATH uptake on PDMS was higher with dopamine as
bio-glue (Fig. 1), \(~74\%\) of the original ATH was lost from PDMS
+ATH after 3 h in blood, whereas only \(~30\%\) was lost from
PDMS+DOP+ATH.

The ATH surface with dopamine is adhesive, thus showed
higher AT adsorption (42.3 ng/cm\(^2\)) compared to PDMS (6.3 ng/
\(cm^2\)), and therefore should have higher anticoagulant activity.

**Conclusions**
An antithrombin-heparin complex (ATH) was
attached to PDMS using dopamine as a bio-glue. The use of
dopamine gave surfaces with higher concentration and greater
stability of ATH. The bound ATH showed potential for anticoa-
gulant activity through extensive adsorption of antithrombin
from plasma.

**Poster abstracts**

**PO-0760 RELIABILITY OF SINGLE-USE PEEP VALVES DURING
MANUAL VENTILATION OF NEONATES**

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10.1136/archdischild-2014-307384.1399

**Background and aim**
Current guidelines recommend self-
inflating bags (SIB), flow-inflating bags and T-piece resuscitators
for manual ventilation of neonates. They further recommend
the use of PEEP. Using a SIB, PEEP can be provided by attach-
ing a PEEP valve to the device. These valves are mostly reus-
able items. However, several studies could show that multi-use
PEEP valves could only deliver insufficient levels of PEEP and
that their reliability was further decreased by repeated sterilisa-
tion cycles.

The aim of our study was to test whether single-use PEEP
valves reliably delivered the set PEEP.

**Methods**
Ten new single-use PEEP valves from 5 different man-
ufacturers (2 valves each from Laerdal (5–20 cmH\(_2\)O), DROH
(0–10 cmH\(_2\)O), Vital Signs (5–20 cmH\(_2\)O), medsize (5–20
cmH\(_2\)O), Ambu (0–20 cmH\(_2\)O)) were attached to an electromechanically driven SIB to ventilate a manikin simulating a 1 kg
preterm infant (PIP 20 cm H\(_2\)O, RR 60/min). The delivered
PEEP was measured and analysed.

**Results**
The valves delivered a mean (SD) PEEP of 3.5 (1.9)
cmH\(_2\)O when set to 5 cmH\(_2\)O and 3.6 (2.9) cmH\(_2\)O when set
to 10 cmH\(_2\)O. One valve could not deliver any PEEP; the second
valve from the same manufacturer could only deliver 0.0 (0.0)
and 1.4 (0.0) cmH\(_2\)O when set to 5 and 10 cmH\(_2\)O, respectively.

**Conclusion**
Single-use PEEP valves could be used as an alterna-
tive to multi-use items to avoid damage caused by repeated steri-
sisation procedures. However, they could not reliably deliver the
set PEEP. Operators should be aware of the valves’ poor reliabil-
ity and test them before each use.

**PO-0761 CLINICAL AND EVOLUTIVE PECULARITIES OF THE
BRONCHOPULMONARY DYSPLASIA AND
WILSON-MIKITY SYNDROME IN PREMATURE CHILDREN**

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10.1136/archdischild-2014-307384.1400

**Background**
Bronchopulmonary dysplasia (BPD) and Wilson-
Mikity syndrome (WMS) are specific respiratory diseases in pre-
mature infants, and utilisation of advanced management techni-
quines will increase the prognosis and life expectancy in children
with BPD and WMS.

**Aim**
To assess clinical features and impact of BPD and WMS on
the appearance of chronic pulmonary diseases in premature
children.

**Methods**
The study presents the results of a clinical and evolu-
tive analysis of 10 children with BPD and 4 with WMS that
were born premature with a birth weight of 700–1400 g, gesta-
tional age 31.92 ± 2.28 weeks.

**Results**
The comparative analysis showed clinical and explora-
tive differences in children with BPD and those with WMS.
Though the prematurity degree was similar, the onset of clinical
signs in children with WMS was later comparing with those
with BPD (9.5 ±2.37 vs 1.4 ± 0.14 days of life, \(p < 0.01\)). Res-
piratory symptoms in the first year of life were less persistent in
children with WMS versus those with BPD, who still presented
with suggestive imagistic sings (diffuse pulmonary nodular infiltr-
es accompanied by cystic changes and areas of hiperinfla-
tion). Pulmonary pathology progressed inchildren with BPD,
causing death in 2 children at 3–5 months of life due to severe
complication. In children with WMS, in evolution was favour-
able with fewer exacerbations, in 1 case with complete involu-
tion confirmed radiologically by the age of 1 year.

**Conclusion**
BPD in premature children has high risks of pro-
gression into chronic pulmonary disease and death. In WMS the
clinical signs appear later, are less severe and their evolution is
more favourable.

**PO-0762 VOLUME TARGETED VENTILATION – EVIDENCE TO
PRACTICE?**

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10.1136/archdischild-2014-307384.1401

**Background and aim**
Volume targeted ventilation when com-
pared to pressure controlled ventilation has been shown to
reduce death and chronic lung disease in ventilated preterm neo-
nates.\(^1\)
Our audit assessed whether ventilated neonates born at
Birmingham City Hospital, UK were appropriately converted to
volume targeted ventilation as per the departmental guideline.

**Methods**
We collected retrospective data from all ventilated neo-
nates born at Birmingham City Hospital, September 2012–
August 2013. We identified 125 neonates, but collected data
from 76. ‘Mechanical Ventilation in Neonates – Sandwell and
West Birmingham NHS Trust Guideline’, May 2012
was our standard and we aimed to achieve 100% compliance.

**Results**
Of the 76 neonates, 35(46%) were excluded due to
being transferred in or out of the unit. Of the remaining 41
(54%) neonates, 34% were switched to volume targeted

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Arch Dis Child: first published as 10.1136/archdischild-2014-307384.1401 on 14 October 2014. Downloaded from http://adc.bmj.com/ on March 26, 2024 by guest. Protected by copyright.
ventilation, 59% were not switched and 7% were started initially on volume targeted ventilation. 8.3% of neonates not switched to volume targeted ventilation had a documented reason for this. 28.6% of neonates changed to volume targeted ventilation were changed in accordance with our departmental guideline.

Conclusion This audit demonstrated poor compliance in switching suitable neonates to volume targeted ventilation. Those that are switched are rarely switched according to the guideline. There is inadequate documentation of the reason for not switching to volume targeted ventilation. These results emphasise the need for ongoing training and education on volume targeted ventilation for all neonatal staff to ensure that our neonates receive the optimum ventilatory care.

### PO-0764

**MATERNAL SMOKING AND THE RISK OF BRONCHOPULMONARY DYSPLASIA (BPD) IN THE VERY LOW BIRTH WEIGHT (VLBW) PRETERM INFANTS**

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Background Bronchopulmonary dysplasia (BPD) is one of the most important adverse sequelae of premature birth and the most common form of chronic lung disease of infancy. It is relevant in the current health care climate due to the health care costs it may generate owing to the long-term respiratory and neurodevelopmental complications.

Aims To understand the prevalence, characteristics and outcomes of BPD cases in a UK tertiary neonatal unit.

Methods The Badger neonatal database was analysed for BPD and cases included if they required oxygen at corrected gestational age. Inborn and outborn babies were included if they required oxygen at corrected gestational age. The increasing demand for home oxygen and associated comorbidities in these babies have implications for paediatric community service teams.

Results In the last 4 years we had 5342 admissions to our neonatal unit, 159 of who had BPD. The results are as below:

<table>
<thead>
<tr>
<th>Inborn</th>
<th>Outborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Mean Gestational Age in weeks (range)</td>
<td>81</td>
</tr>
<tr>
<td>Mean Birth Weight in grams (range)</td>
<td>810</td>
</tr>
<tr>
<td>Male/ Female</td>
<td>45/36</td>
</tr>
<tr>
<td>Mean Ventilation Days (range)</td>
<td>22.8</td>
</tr>
<tr>
<td>Mean CPAP Days (range)</td>
<td>37.8</td>
</tr>
<tr>
<td>Postnatal Steroid</td>
<td>15</td>
</tr>
<tr>
<td>Evidence of Pulmonary Hypertension</td>
<td>4</td>
</tr>
<tr>
<td>Total Deaths</td>
<td>2</td>
</tr>
<tr>
<td>Home oxygen</td>
<td>30</td>
</tr>
<tr>
<td>Average length of stay (days)</td>
<td>107</td>
</tr>
</tbody>
</table>

Conclusion Smoking was not confirmed as a definite risk factor for BPD as well as other related variables in a group of preterm infants born by smoking and non-smoking women.

Methods A retrospective analysis based on medical records was performed. Data of VLBW preterm newborns <32 weeks gestational age, born during one year and hospitalised in the neonatal intensive care unit of a tertiary perinatal centre were collected and statistically analysed using Mann-Whitney and Pearson’s Chi-square tests.

Results Analysis included 185 newborns. Mothers admitted smoking in 22 cases (12%). Gestational age and birth weight were similar in both groups (28 vs 27.5 weeks and 1203 g vs 1108 g, p > 0.05). BPD prevalence did not differ significantly between both groups (36% vs 39%, p > 0.05). Among newborns in the smoking group there was a higher mortality (27% vs 18%, p > 0.05) but this was not statistically significant. There were no significant differences between groups in the need for surfactant therapy (36% vs 43%, p > 0.05) or the length of mechanical ventilation (mean 15.6 vs 12.9 days, p > 0.05).

Conclusion Smoking was not confirmed as a definite risk factor for BPD in this study. This may be due to the multifactorial pathogenesis of the disease but possibly also associated with the methodology that was based on mothers’ declaration regarding smoking without a laboratory screening.

### PO-0765

**INTRODUCTION OF INSURE THERAPY – EXPERIENCES AND LIMITATIONS**

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Background and aims Respiratory Distress Syndrome is the most frequent cause of respiratory insufficiency in premature infants. The essentials of INSURE therapy are INNubation after noticing the condition of RDS, SURfactant therapy and Extubation to non-invasive respiration. At our ward INSURE therapy was introduced in 2012.

Methods We analysed our patients who received INSURE therapy during the 21-month-long period from July 1, 2012 until March 31, 2014. INSURE therapy was considered effective, if the patient did not require invasive ventilation within 1 week. During the examined period 398 patients were admitted to our 18-bed tertiary Neonatal Intensive Care Unit. INSURE therapy was applied in the case of 82 preterms (gestational age: 29 ± 3 weeks, birthweight 1358 ± 404 g; mean ± SD).

Results A surfactant (Curosurf®) dose of 168 ± 39 mg/kg was administered. There was no need for repeated intubation in 57 cases, in 13 cases a second dose was surfactant was also