Content validity: The scoring instrument was applied to infants (n = 115) by HCPs who were asked to rate each item/domain for clinical relevance. All items/domains were assessed as relevant. However there were substantial missing data for two domains (chest auscultation/blood gas analysis) as certain HCP groups could not undertake these procedures. These two domains were consequently removed.

Cognitive interviewing: HCPs (n = 15) were interviewed in order to assess comprehension, interpretation and how they arrived at their responses for each item/domain in the scoring instrument. Understanding of medical vocabulary was assessed. 'Sub-sternal recession' was removed and 'anuric' changed to 'not passed urine'.

Construct validity & paediatrician inter-rater reliability: HCPs applied the scoring instrument to infants (n = 128) whilst two senior doctors assessed whether the infant had 'mild', 'moderate' or 'severe' bronchiolitis. Cut points within the score have now been established for 'mild', 'moderate' and 'severe' bronchiolitis.

Conclusions We have developed and partially validated a clinical severity score for infants with bronchiolitis. Criterion and reliability testing of the score is planned for the 2013/14 bronchiolitis season. Responsiveness to change will be assessed in a future clinical trial.

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S76 NON-INVASIVE POSITIVE PRESSURE VENTILATION TO REDUCE CHILDHOOD MORTALITY FROM ACUTE RESPIRATORY FAILURE IN RURAL GHANA

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Introduction and Objectives Acute respiratory failure (ARF) is a major cause of mortality in the developing world, exacerbated by resource limitation. Non-invasive positive pressure ventilation (NIPPV) is a potential simple way to reduce mortality, and whilst established in adults, evidence in children is lacking.

Methods The study was conducted in Tumu District Hospital in Northern Ghana, which serves a catchment of 56,000 and has an under-5 Mortality of 142 per 1000 live births. Two Nippy Junior paediatric pressure controlled portable ventilators, chosen for ease of use and robustness, were used along with finger monitors to measure oxygen saturation and heart rate. Training of nurses, the nurse anaesthetist and the doctor was achieved with interactive lectures, hands-on workshops and competency assessment over 3 days in November 2011 and April 2012. Laminated guides attached to each machine outlined criteria to commence, escalate and wean NIPPV. Criteria for commencing NIPPV were based on respiratory rate, oxygen saturation, intercostal recession and expiratory grunting.

Results In the initial 4 months of NIPPV use, 657 children under 5 were admitted with 11 deaths, of whom 84 received NIPPV with 3 deaths. In the subsequent 9 months, NIPPV was used in 46 children and 11 adults, with no deaths. Of 140 patients ventilated in 2012, 106 (76%) were under five and 60 (43%) under the age of two. There were 2 deaths from malaria/sepsis with an overall mortality of 1.4% (1.9% <5 years). Primary diagnoses by age as best available are displayed in figure 1. No complications were reported apart from discomfort in some patients. Patients were ventilated for shorter periods than usual in the developed world. Ventilation times were notably shorter in malaria patients. Those with respiratory tract infections and pneumonia tend to be ventilated longer and were often more comfortable with ventilation for longer periods at a time.

Conclusions This feasibility study shows NIPPV for ARF in children in a rural setting can be delivered safely with minimal training and appears to impact significantly on mortality in those under 5.

Diagnosis	0-5 years n = 106	5-16 years n = 23	>16 years n = 11
Malaria	40 (38%)	10 (43%)	0
Septicaemia	27 (25%)	4 (17%)	0
Pneumonia/Bronchiolitis	16 (15%)	3 (14%)	4 (36%)
Gastroenteritis	11 (10%)	0	0
Anaemia	10 (9%)	3 (14%)	0
Asthma	2 (2%)	1 (4%)	5 (45%)
Other		2 (8%)	2 (19%)

Abstract S76 Figure 1.

S77 BENCHMARKING STANDARDS IN PAEDIATRIC PLEURAL INFECTION MANAGEMENT

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Introduction and Objectives In our centre patients are managed using a protocol-driven integrated-care pathway. Intra-pleural urokinase is administered via a fine bore chest-drain as primary therapy for significant pleural disease. We analysed patient outcomes with this approach to benchmark standards of care whilst examining patterns of disease severity with introduction of the pneumococcal conjugate vaccine. In addition we aimed to identify factors associated with failure of fibrinolytic therapy, defined as the need for a second intervention, (second chest-drain, VATS or thoracotomy).

Methods Medical case-records were reviewed on all children managed at a tertiary centre from Jan 2006-Dec 2012. We examined outcomes on all patients including those with significant medical comorbidities. Data were analysed using binary logistic regression in order to try to identify factors associated with therapy failure, (SPSS Version 20). The effect of; age, comorbidities, number of days of intravenous antibiotics prior to drainage, number of doses of urokinase given and whether initial imaging, (plain radiograph, ultrasound or CT), showed evidence of necrotising disease.

Results A total of 242 children were treated; age range 4 months-19 yrs; median 4 yrs. We observed a decreasing number of children presenting year-on-year with complicated pleural infection, (Figure 1). The vast majority of children were managed without surgery using either antibiotics alone (28%), or a fine-bore chest-drain and urokinase (70%), with good outcome. Only 2% children required a primary thoracotomy whilst 14.6% failed fibrinolytic therapy and required a second intervention. The only factor that appeared to predict failure was the suspicion of necrotising disease on initial imaging (p = 0.01, OR 0.11). Median length-of-stay for all children, including those with medical co-morbidity, was 10 days (range 1–118 days).

Conclusions We have observed a decreasing incidence of complicated pleural infection at this centre since 2006. Good patient