and 4/28 (14.3%) referred for oxygen assessment. 33.3% of eligible patients were referred to pulmonary rehabilitation. 77.5% required and were provided with a written educational pack, and a formal crisis management plan formulated for 49.3% cases. Inhaler technique was inadequate in 10.2% of patients and in part drove the prescribing changes.

Conclusion Using computer guiding consultation in real life practice resulted in substantial management recommendations and diagnostic revisions. COPD care can be improved, using computer guided consultation which enables non specialists to achieve it.

Paediatric airway infections

S72 PAEDIATRIC PNEUMOCOCCAL EMPYEMA SEROTYPES HAVE NOT CHANGED FOLLOWING INTRODUCTION OF THE 13 VALENT PNEUMOCOCCAL VACCINE

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Introduction Pneumococcal infection is the leading cause of paediatric empyema in the UK. Prior to the change in the UK routine vaccination schedule from the seven valent conjugate pneumococcal vaccine (PCV-7) to the thirteen valent vaccine (PCV-13) in April 2010 four serotypes /serogroups–1, 3, 7A/F and 19A accounted for 75% of culture negative pneumococcal empyema in UK children. Antigen for these four serotypes is not present in PCV-7 but is present in PCV-13. We examined the impact of PCV-13 on the incidence of disease due to serotypes 1, 3, 7A/F and 19A using national surveillance data from the UK-ESPE study.

Methods Pleural fluid samples were forwarded from admitting hospitals. Those that were pneumococcal PCR positive underwent non-culture serotyping using a multiplex antigen detection assay capable of detecting 14 serotypes/groups (1, 3, 4, 5, 6A/C, 6B, 7F/A, 8, 9V, 14, 18, 19A, 19F and 23F). Two time periods were analysed April 2008–April 2010 (PCV-7 era) and April 2010–April 2012 (PCV-13 era). Incidence rate ratios (IRR) were calculated for individual serotypes. Age distributions were compared by density plotting.

Results 380 samples (median age 3.8 years) were tested in the two time periods (191 PCV-7 era, 189 PCV-13 era). No reduction in the incidence of empyema caused by the four main serotypes/groups (IRR: Serotype 1–0.79 95% CI (0.57–1.11), 3–0.91 (0.60–1.37), 7A/F–1.59 (0.85–3.04), 19A–2.42 (1.61–5.40)) was seen and 19A increased significantly. The age distribution of each serotype did not change between the two time periods.

Discussion The introduction of PCV-13 has not yet been associated with any reduction in the incidence of vaccine serotype pneumococcal empyema in children in the UK, in contrast to the changes following the introduction of PCV-7. The factors contributing to this remain unclear but may include a predominantly PCV-7 vaccinated cohort, insufficient herd immunity, inadequate immunological response to vaccine antigen or on-going secular trends. Continuing surveillance is essential and will provide important data on future trends to better understand these complex processes.

S73 TRENDS IN EMPYEMA IN SCOTTISH CHILDREN 2000–2011

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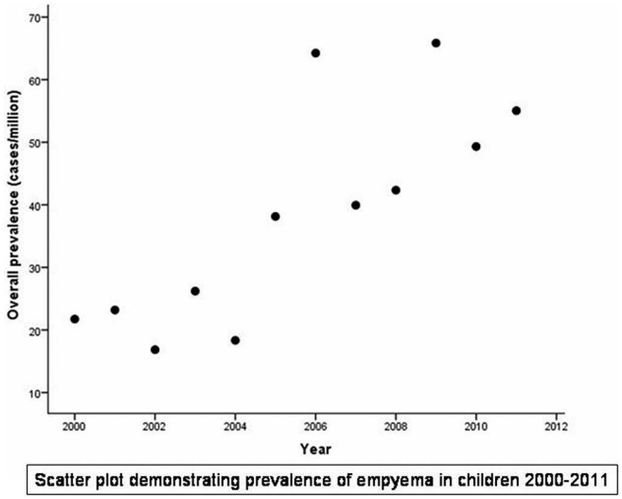
Background An abrupt rise in empyema prevalence in children was noted in the UK and other countries during the late 1990s and early 2000s. Time trends in empyema prevalence in Scotland has not been described since 2005 at a time when prevalence appeared to be still rising[1]. A number of factors may have changed empyema prevalence since 2005 including the 2006 smoking ban and introduction of heptavalent (2006) and 13-valent (2010) pneumococcal vaccinations. Here we applied our previous methodology[1] to test the hypothesis that the prevalence of childhood empyema continues to rise beyond 2005.

Methods This was a whole population study of 2000–2011 hospital admissions using ICD-10 diagnostic codes. As previously we captured admissions for pneumonia and croup to detect increasing prevalence of admissions with other respiratory presentations.



Abstract S73 Figure 1.

Results Over this 12 year period there were 398 cases of empyema. The prevalence rose from 22cases/million in 2000 to 55 cases/million in 2011 (see figure), equivalent to a rise of 4 cases/million/year ($R^2 = 0.81$ $p = 0.002$). Within the 1–4 year age range, empyema prevalence rose by 10 cases/million/year ($R^2 = 0.86$ $p < 0.001$) whilst prevalence did not change for the under 1 and 10–14 year old age range. The prevalence of croup and pneumonia for did not change during 2000–2011 suggesting that increased empyema prevalence did not reflect increasing respiratory admissions or increasing pneumonia prevalence.

Conclusion The prevalence of empyema in Scottish children has continued to rise beyond 2005 and the reason for this is not clear. Public health initiatives introduced since 2005 do not appear to have altered empyema prevalence in children.

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S74 IS BRONCHOSCOPY NEEDED IN CHILDREN WITH PERSISTENT BACTERIAL BRONCHITIS?

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Introduction and Objectives Persistent bacterial bronchitis (PBB) is increasingly recognised as a cause of chronic cough in young children but there is lack of consensus about investigation and treatment. At UHNS, children with a wet cough for >6 weeks unresponsive to oral antibiotics prescribed by the GP are investigated with CXR, baseline immune function and flexible bronchoscopy with bronchoalveolar lavage (FB-BAL). Patients with confirmed PBB are then treated with a prolonged course of an appropriate antibiotic. Some centres reserve FB-BAL for those who do not respond to blind treatment with co-amoxiclav or clinically relapse. The objective was to review bronchoscopic findings and immune function in children with chronic cough to determine which investigations are necessary.
Methods A retrospective case note review of all children investigated for chronic cough between May 2011 and June 2013.
Results The notes of 44 children with chronic cough were reviewed. BAL samples were taken from 6 lobes in every patient. Median (IQR) age at bronchoscopy was 3.3 (1.8–4.4) years. Positive BAL cultures were obtained from 35 patients (80%). Ten patients (23%) isolated ≥2 organisms. *Haemophilus influenza* was identified in 20 (46%), *Moraxella catarrhalis* in 11 (25%), *Staphylococcusl aureus* in 10 (23%) and *Streptococcus pneumoniae* in 6 (14%). *Candida albicans*, *Group A Streptococcus*, *Haemophilus parainfluenzae* and a *gram negative bacillus* were each identified in 1 patient (2%). In 13 (30%) at least 1 organism was isolated that was unlikely to respond to co-amoxiclav. If the right middle lobe (RML) had been the only lobe sampled (as per ERS guidance) organisms would have been missed in 14 patients (32%). Suboptimal functional antibodies to *Haemophilus influenza* or *Pneumococcus* were identified in 7 patients (16%). Appropriate antibiotics were prescribed for all patients with a positive culture. Co-amoxiclav was the most commonly prescribed antibiotic and was used in 20 patients (57%). Treatment duration varied between 4 and 8 weeks.
Conclusions FB-BAL is a useful investigation to aid the diagnosis and guide treatment in PBB. The best time to perform FB-BAL is not known. In PBB a number of organisms will be missed if BAL is only taken from the RML.

S75 THE DEVELOPMENT AND VALIDATION OF A CLINICAL SEVERITY SCORE FOR INFANTS WITH BRONCHIOLITIS

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Introduction and Objectives Bronchiolitis is a viral lower respiratory tract infection of infancy.[1] 1–3% of all infants are admitted to hospital with 3% of hospitalised infants requiring critical care.[2]
Objective To develop and validate a scoring instrument for use by health care professionals (HCPs) in infants with bronchiolitis which has clinical utility.
Methods Psychometric methods were used to develop the scoring instrument and to test the instrument for validity and reliability in a variety of clinical locations.
Results *Item generation, reduction & instrument development:* 101 items were identified from the literature and focus group workshops (families & HCPs). Consensus for importance was achieved for 45 items (Table 1) following a Delphi survey of 195 HCPs. A scoring instrument with 12 domains was developed.

Abstract S75 Table 1. Signs, symptoms & risk factors.

Respiratory Symptoms	Risk Factors & Miscellaneous symptoms	Level of Consciousness	Hydration & Perfusion
1. Respiratory rate	21. Day of illness	31. Alertness	37. Feeding
2. Grunting	22. Personal concerns / 'gut' feeling	32. Irritability	38. Urine output
3. Nasal flare	23. Parental concerns	33. Drowsiness	39. Central capillary refill time measured
4. Recession	24. General condition	34. Responds to pain	over a given time
5. Accessory muscle use	25. Chronic lung disease	35. Unresponsive	40. Peripheral perfusion
6. Dyspnoea	26. Congenital heart disease	36. AVPU scale (alert, verbal,	41. Mottled appearance
7. Tracheal tug	27. HIV/ immunodeficiency	pain, unresponsive)	42. Sunken eyes
8. Respiratory pattern	28. Gestational age (<37 weeks)		43. Sunken fonatanelle
9. $PaCO_2$ on blood gas analysis	29. Low birth weight		44. Heart rate
10. Ph on blood gas analysis	30. Bacterial or viral co-infection		45. Pallor
11. Apnoea			
12. Stridor			
13. Head bobbing			
14. Using stomach to breathe			
15. Cyanosis			
16. Effort of breathing			
17. Air entry			
18. Oxygen requirements			
19. Oxygen saturation			
20. See saw chest motion			