which should be delivered for all patients is mandated, irrespective of ward, or specialty, delivering care. A COPD discharge care bundle was developed by the NIHR CLAHRC for North-west London [Hopkinson *et al* 2012] and has been adopted by a number of acute hospitals in London, incentivised in some by commissioners using the Commissioning for Quality and Innovation (CQUIN) payment framework.

Methods To provide initial information on use of the bundle and readmissions we performed a Negative Binomial regression interrupted time series analysis comparing 7, 28 and 90 day readmission rates in hospitals before and after bundle adoption. The bundle was implemented at various time points between 2009 and 2011 in 9 Trusts in London, comprising 15 hospitals. Data from April 2002 to March 2012 were obtained from Hospital Episode Statistics using COPD exacerbation codes - J440 & J441 in the first position. Results were controlled for seasonality using month of admission and were also controlled for age and sex of patients at Trust level.

Results Following implementation of the COPD discharge bundle there was a significant change in the trend for the 28-day readmission rates for patients discharged after AECOPD. Falls were also indicated for 7- and 90-day readmissions, although these were not statistically significant at $p < 0.05$.

Conclusion These data suggest that the care bundle approach may be one systematic way to improve outcomes in patients admitted with an AECOPD. More work is needed, however, to separate any effects of the care bundle from other initiatives, e.g. Local Enhanced Services, that support delivery of evidence-based care in COPD i.e. quit-smoking interventions and pulmonary rehabilitation.

Hospital readmissions among hospital Trusts using the care bundle, before and after implementation

	7 day readmissions	28 day readmissions	90 day readmissions
Mean annual number (2002 – 2012)	209	563	1015
Annual trend pre bundle (%) *	+0.3% (0.005)	+0.3% (<0.001)	+0.3% (0.003)
Annual trend post bundle (%) **	-0.5% (0.099)	-0.8% (0.003)	-0.5% (0.099)

* pvalue for overall trend

** p value for difference between trend pre bundle implementation and post implementation

Abstract S69 Figure 1.

S70 IMPLEMENTING A COPD DISCHARGE BUNDLE ON A LARGE SCALE

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Introduction There is emerging interest in the delivery of discharge care bundles to manage patients admitted with an an exacerbation of a chronic disease. This approach has been tested on a limited number of patients and the importance of care bundles has been acknowledged by the BTS. However, it is unclear how COPD discharge bundles could be implemented on a larger number of patients without additonal resources.

Objective We wanted to audit the effect of implementing a COPD discharge bundle to all patients discharged with a primary diagnosis of COPD upon smoking cessation and pulmonary rehabilitation (PR) referral rates and to establish the effect upon length of stay (LoS).

Methods We redeployeda Respiratory Early Discharge Service (REDS) in order to deliver the University Hospitals of Leicester COPD discharge bundle. This is comprised of evidence-based interventions including:referral to smoking cessation and PR services, implementation of a self management plan, assessment of inhaler technique, follow up phone calls at 2 working days and 15 days post discharge. The discharge bundle was delivered by the REDS team from April 2012 to March 2013. The total number of patients discharged with a primary diagnosis of COPD (diagnosis code J41–44) from Glenfield Hospital was collected along with referral rates to smoking cessation and PR services. Mean LoS for those patients receiving the care bundle was also recorded.

Results From April 2012 to March 2013 a total of 1742 patients were discharged with a primary diagnosis of COPD. 1160 of these patients received the COPD discharge bundle. Smoking cessation referrals rose from 23.7% in quarter 1 to 48.3% in quarter 4. Pulmonary rehabilitation referals rose from 39.7% in quarter 1 to 55.9% in quarter 4. Mean LoS for patients who received the discharge care bundle was 6.17 days compared to 7.22 days for 2011–2012. The mean LoS for patients who did not receive the care bundle was 7.08 days.

Conclusions A COPD discharge care bundle can be implemented on a large scale with increased referral rates to smoking cessation and PR services. No increase in LoS was noted dispite redeploying an early discharge service.

S71 COMPUTER-GUIDED CONSULTATION IN COPD PRACTICE

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RATIONALE We previously showed a comprehensive computer guided-consultation (containing prompts developed from NICE guidelines) in COPD primary care was feasible without specialist training, while preserving the autonomy of clinical decision making. The pilot study based on COPD primary care register, 88% had a proposed management change and 29% of patients had a diagnostic revision. We have re-examined the impact in real life to determine if this is repeated.

Methods We report on review of 2000 patients drawn from COPD registers across 78 practices. 459 (23%) did not have COPD based on spirometry. 1541 with COPD, had a mean (SD) age of 69.4 (9.8) yrs, 903 (58.6%)male, 1407 (91.6%) had been smokers and 597 (38.4%) were current smokers. The mean (SD) FEV1 was 1.48 (0.56) with a mean FEV1 percent predicted of 61.4 and a mean FEV1/FVC ratio of 52.4. The mean (SD) MRC score was 2.58 (0.9) and BMI was 27.0 (5.9).

Results Treatment modifications were implemented across various interventions. Pharmacological recommendations included the addition of: Short-acting bronchodilator in 75/1541 (4.9%), and a long-acting bronchodilator (LAMA) in 78/1541 (5.1%). Long-acting beta agonist/inhaled corticosteroid combination (LABA/ICS) was added in 75 patients including 37 with only moderate disease. In 32 (1.8%) patients the recommendation was to discontinue various inhaled medication and in 28 (1.6%) patients these were LABA/ICS combinations. In addition, 28.8% of patients currently smoking, accepted referral for smoking cessation support. 38 patients had hypoxia, 10 already on oxygen,

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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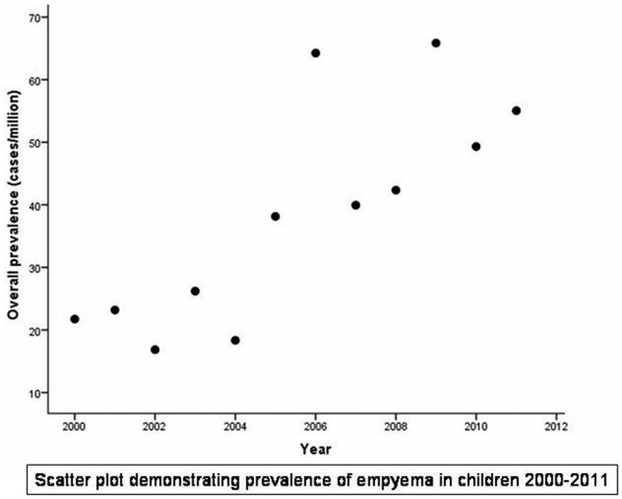
Background An abrupt rise in empyema prevalence in children was noted in the UK and other countries during the late 1990s and early 2000s. Time trends in empyema prevalence in Scotland has not been described since 2005 at a time when prevalence appeared to be still rising[1]. A number of factors may 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.