

Abstract S12 Table

COPD category	SABA (%)	SAMA (%)	LABA (%)	LAMA (%)	ICS/LABA (%)	ICS (%)	Theophylline (%)	Mucolytic (%)
Mild	74% (70)	14% (16)	4% (10)	28% (24)	41% (32)	23% (31)	4% (6)	6% (4)
Moderate	82% (78)	18% (19)	4% (12)	38% (41)	60% (43)	23% (32)	7% (9)	9% (8)
Severe	91% (86)	18% (19)	7% (15)	55% (52)	75% (54)	24% (31)	17% (19)	25% (12)
FEV ₁ >80%	67% (59)	8% (12)	5% (6)	27% (20)	37% (26)	19% (24)	3% (5)	5% (2)

COPD, chronic obstructive pulmonary disease; ICS, inhaled corticosteroids; LABA, long-acting beta agonists; LAMA, long-acting anticholinergics; SABA, short-acting beta agonists; SAMA, short-acting anticholinergics.

(FEV₁, FVC), smoking habits and effect of smoking cessation advice, was undertaken.

Results: 268 subjects were seen, 65 on multiple occasions. 214 (79%) were involved with asbestos handling or removal. 42 (16%) worked in supervisory or managerial capacities. 12 (5%) were laboratory analysts. Current smoking rates for handlers and removers was 67% (144/214), for the supervisory and managerial group 36% and analysts 33% ($p = 0.015$). Ex-smoking rates were 11% for handlers and removers, 38% for the supervisory and managerial group and 8% for analysts. Non-smoking rates were 22% for handlers and removers, 46% for supervisors and managers and 58% for analysts. The proportions of smokers, ex-smokers and non-smokers did not change with time. The rate of decline in FEV₁ for current smoking handlers and asbestos removers was 52.8 ml per year, and for supervisors, managers and analysts 22.3 ml per year ($p = 0.0023$). The mean for FEV₁ decline in non-smokers and ex-smokers was 37.5 ml/year.

Conclusions: Workers with highest asbestos exposure are significantly more likely to be current smokers and to have greater decline in FEV₁, conferring greater disease risk.² Smoking behaviour has not changed since our first records in 1983. Consultant advice on cessation was ineffective for the group most at risk.

1. HSE Asbestos-related database, 2007.
2. HSE Executive report, mesothelioma deaths the latest picture for Great Britain, 1981–2005.

Chronic obstructive pulmonary disease: organisation of care

S12 BENCHMARKING CHRONIC OBSTRUCTIVE PULMONARY DISEASE ACROSS AN INNER CITY PRIMARY CARE TRUST: ONE YEAR ON

JA Roberts. *Salford PCT, Salford, UK*

Background: Our integrated chronic obstructive pulmonary disease (COPD) team works closely with general practice to improve COPD care in a primary care trust (PCT) with high levels of social deprivation and COPD. Integral to our approach is the general practice COPD register that uses a standardised template to structure consultations in line with national guidelines. De-identified data are collected remotely at 3-month intervals.

Aims: To compare data from baseline with those available at 12 months. To establish general practice adherence to guideline recommendations on COPD follow-up and management.

Methods: We retrospectively analysed data from the COPD register at 12 months and compared with baseline COPD prevalence, FEV₁ percentage predicted, MRC score, smoking status and current medication.

Results: 12-month data were available from 25 of 56 practices (55% of the total population and 56% of the COPD population). Recorded diagnosis of COPD $n = 3291$ ($n = 2888$ baseline). Mean prevalence 2.4% (range 1.3–4.5%; 2.1% baseline). 53% female. Mean age 68.7 years (range 30–97). Smoking status at 12 months (baseline), never smoked 12% (12%), ex-smoker 48% (46%), current smoker 40% (42%). 48% of patients ($n = 1574$) had a read code for

COPD review in the last 12 months (range 0–83%). 54% ($n = 1781$) of patients had undergone spirometry in the last 12 months. Severity of COPD could not be ascertained from 51 of these readings. 12% had FEV₁ greater than 80% (10% baseline), 53% mild COPD (44% baseline), 27% moderate COPD (30.5% baseline), 8% severe COPD (10% baseline) according to NICE guidelines (2004). MRC score was recorded on 48% of patients (27% at baseline). The table highlights the proportion of patients receiving drug treatment category according to severity for total COPD population at 12 months (baseline).

Conclusions: In the 12 months since baseline: 430 additional patients were added to the COPD register. Smoking rates remain above the national average and have not reduced significantly. Only 50% of patients were reviewed or had spirometry within the last 12 months as per NICE 2004 guidelines. This maybe due to general practice opting to follow QOF requirements to review patients every 15 months rather than NICE guidelines.

S13 SHOULD CHRONIC OBSTRUCTIVE PULMONARY DISEASE SERVICE DELIVERY IN AN INNER CITY PRIMARY CARE TRUST BE TARGETED AT GENERAL PRACTICE OR PRACTICE-BASED COMMISSIONING CLUSTER LEVEL?

JA Roberts. *Salford PCT and Salford Royal Hospital Foundation Trust, Salford, UK*

Background: Socioeconomic deprivation has been independently associated with chronic obstructive pulmonary disease (COPD) in both longitudinal and cross-sectional analyses. It is not known if such associations influence COPD at a local level. Furthermore, there is a paucity of literature on methodologies that can guide health commissioners to redesign COPD services to meet the health needs of their local population.

Objectives: To investigate the association between socioeconomic status and COPD prevalence and morbidity (defined by disease severity (FEV₁ % predicted), unscheduled hospital admissions and length of hospital stay) in an inner city primary care trust and to inform service redesign.

Methods: An exploratory cross-sectional analysis of the general practice-registered COPD population of the PCT using innovative data collection methods. Data were pooled from a variety of sources at practice-based commissioning cluster level. Pearson's correlation coefficient was used to investigate simple linear relationships between IMD and outcome measures. Analyses were carried out in SAS version 9.1 in a Windows NT environment.

Results: The mean level of socioeconomic deprivation at cluster level was 41 (SD 11.1) and varied significantly ($p \leq 0.001$). The mean age of the cluster population was 37.1 years (SD 4.3) and mean age of the COPD population was 68.7 years (SD 10.7). The mean prevalence of COPD was 2.5% (SD 0.9). 53.4% of the COPD population were women. Smoking rates were significantly higher in both the general and COPD population of deprived clusters. The proportion of the COPD population with severe disease was 9.5%. There was a strong positive association between socioeconomic deprivation and COPD prevalence ($r = 0.76$, $p = 0.02$). Positive but non-significant associations between hospital admission and deprivation were also seen ($r = 0.26$, $p = 0.053$).

Conclusions: There are positive associations between socioeconomic deprivation and COPD in the PCT. Probable confounding data indicate that further regression modelling at practice rather than practice-based commissioning cluster level is needed. Innovative methodology can be used to inform service redesign.

S14 CARELESS NOTE-TAKING COSTS MONEY: LESSONS FROM A CODING AUDIT OF RESPIRATORY HOSPITAL EPISODES

¹S Maxwell, ¹A McCall, ²PA Corris, ²GJ Gibson, ²JL Lordan, ²A Ward, ²AJ Fisher, ²BG Higgins, ²A De Soya. ¹Department of Clinical Coding Freeman Hospital, Newcastle upon Tyne, UK; ²Department of Respiratory Medicine, Freeman Hospital, Newcastle upon Tyne, UK

Background: Nationally agreed HRG tariffs dictate the recharge cost of a hospital admission between secondary care and purchasers. Errors in hospital coding may result in incorrect revenues. Medical notes are used by clinical coders to attribute HRG codes by skilled coders who have no medical training. Hypotheses: better clinical records and/or a coding assist sheet (proforma) will improve clinical coding accuracy and efficiency.

Aims: To review the HRG tariffs for common respiratory conditions and identify areas in which coding deficits may occur. Implement a coding assist sheet and audit the benefits of this.

Methods: HRG tariffs 2007–8 were reviewed and a draft coding assist proforma implemented over two 1-month periods with a comparison of codes attributed without and with proforma. Respiratory failure was defined as PaO₂ <8 kPa.

Results: Significant areas of potential income loss were identified based on HRG tariffs; chronic obstructive pulmonary disease (COPD) emergency admission with complications £2360, whereas respiratory failure emergency admission £3292. Significant revenue differences were noted between unspecified lower respiratory tract infection £2059, lobar pneumonia with complications £2967 and bronchopneumonia with complications £3340. In the first audit period proforma use was low (22%) and marginally better in the second (32%). Identifying changes in coding/revenues was confounded as dissemination of the HRG codes and first audit altered clinical note-taking behaviour. Respiratory failure was recorded in 10 cases of COPD in which the respiratory failure was the primary requirement for treatment; a minimum of £9000 revenue could have been lost without this being recorded (HRG tariff difference between COPD and respiratory failure = £900 × 10 cases).

Conclusions: There was an increase in the recording of respiratory failure, lobar or bronchopneumonia in medical case notes. Better note-taking occurs as a result of understanding the HRG tariffs and implementation of a proforma. Respiratory failure is recognised in approximately 10% of COPD admissions with 72 cases per average district general hospital (Plant, 2000). This may not be specifically recorded in notes after blood gas sampling. A possible loss of £65 000 will occur if respiratory failure is not used as a primary code. The use of a proforma with respiratory codes should be considered and audited.

S15 DO WE HAVE ENOUGH SPECIALIST STAFF TO MANAGE ACUTE CHRONIC OBSTRUCTIVE PULMONARY DISEASE ADMISSIONS IN THE UK?

¹A Patel, ¹R Kaiser, ¹P Mallia, ²RJ Buckingham, ²RA Stone, ²CM Roberts. ¹Whipp's Cross University Hospital, London, UK; ²Clinical Effectiveness & Evaluation Unit, Royal College of Physicians, London, UK

Background: Chronic obstructive pulmonary disease (COPD) remains a significant cause for admission to hospital. The 2003 national UK COPD audit demonstrated significant inadequacies in staffing respiratory departments that deal with acute COPD admissions.

Methods: The lead respiratory clinicians from the vast majority of acute secondary care units (n = 239) representing 98% of all acute trusts responded to a survey regarding staffing levels in 2008 as part of the national COPD audit.

Results: Units had a median value of 10 220 general medical admissions with a median value of 483 admissions attributable to COPD, a modest increase from 458 5 years previously. There are a median of three whole time equivalent (WTE) respiratory consultants per unit compared with two in the 2003 study. Most respiratory departments are staffed with two FY1, two FY2/ST1–2/SHO, and two ST3–4/SpR grade doctors. The proportion of units with one or fewer WTE respiratory consultants is 11% compared with 26% 5 years ago. Notably, 2% of units still have no WTE specialist respiratory consultant and 11% have no middle grade doctor in training. One in three units has a vacant post, most commonly a specialist nurse or a registrar grade doctor, arguably those at the forefront of day-to-day decision-making. Worryingly, there is no COPD nurse in 38% of units and only 39% have more than one WTE post filled. There is a median of two other specialist respiratory nurse WTE posts. Almost half of units have one or fewer WTE lung function technicians and 8% have no lung function staff. 72% have one or fewer WTE specialist respiratory physiotherapists employed. One in five units have no dedicated respiratory physiotherapist whatsoever.

Conclusion: Although significant improvements have been made since 2003, staffing is clearly suboptimal in a field that relies on a coordinated multidisciplinary approach. These data provide evidence for respiratory units to lobby both acute trusts and primary care organisations to increase consultant levels to those recommended by the BTS/RCP. Greater effort must be made to reinforce the multidisciplinary team members and these data point specifically to a shortage of specialty nurses suggesting a need to improve access to training programmes for COPD care.

S16 THE ORGANISATION OF CARE FOR ACUTE CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN UK HOSPITALS: PROGRESS SINCE 2003

¹RJ Buckingham, ²A Patel, ²P Mallia, ²R Kaiser, ¹RA Stone, ¹CM Roberts. ¹Clinical Effectiveness and Evaluation Unit, Royal College of Physicians, London, UK; ²Whipp's Cross University Hospital, London, UK

Background: Chronic obstructive pulmonary disease (COPD) remains an important cause of acute hospital admissions. The 2003 national COPD audit revealed major shortcomings in the organisation of hospital care for these patients.

Methods: As part of the 2008 national UK COPD audit, the lead respiratory clinicians from the vast majority of acute secondary care units (n = 239) representing 98% of all acute trusts that admit acute COPD patients responded to a survey regarding the organisation of care.

Results: The number of units that have two take ward rounds by an on-call consultant per 24-h weekday has increased over the last 5 years from 56% to 73%. A ward-based system is becoming more popular with approximately four in five units employing this approach compared with three in five in the previous study. Although only just over half of the acute units surveyed had a specialty triage system in place, this represents a significant increase from one-third in the 2003 national audit. A significant reduction has been identified in the number of units without a specialist respiratory ward, this has more than halved from 34% in 2003 to 16%. Importantly, there has been a fall from 18% to 10% in the number of units with no high dependency unit (HDU) provision and early warning/ICU outreach systems are more prevalent, having gone from 61% to 87% of units. The availability of non-invasive ventilation has increased from 89% in 2003 to 97%. Although 23% of units state that invasive ventilation is not routinely available to COPD patients. It is intended to use organisational factors such as these to derive an overall score for units with which they may benchmark against the national trend.

Conclusion: The organisation of acute respiratory secondary care has improved over the past 5 years but there are still clear inequalities to address between units particularly with regard to HDU and outreach services for our sickest patients. The stated lack

of available invasive ventilation for COPD patients is of particular concern. Grading units on their organisation of services may highlight units that require a review of services.

S17 PROVISION OF CARE FOR ACUTE CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN UK HOSPITALS: A SURVEY OF EARLY DISCHARGE SCHEMES

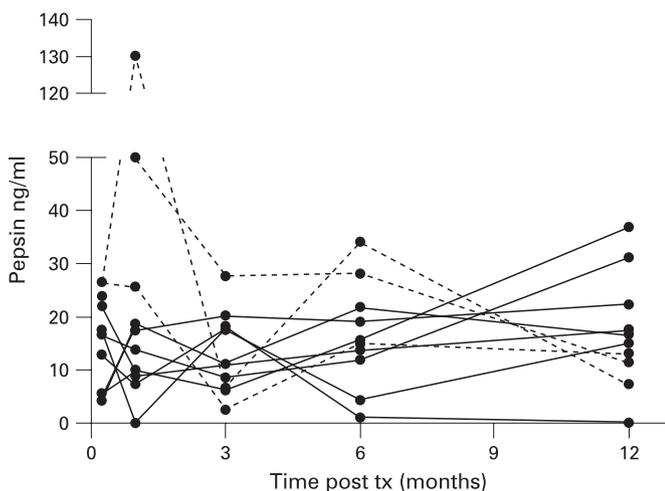
¹A Patel, ¹R Kaiser, ¹P Mallia, ²RJ Buckingham, ²RA Stone, ²CM Roberts. ¹Whipp's Cross University Hospital, London, UK; ²Clinical Effectiveness and Evaluation Unit, Royal College of Physicians, London, UK

Background: The median length of stay for chronic obstructive pulmonary disease (COPD) admissions in the UK is 6 days, accounting for more than one million bed days in England alone. Despite this enormous burden to the health service, the 2003 national UK COPD audit demonstrated that early discharge schemes (EDS) were not available in most units.

Methods: For the 2008 national COPD audit, the lead respiratory clinicians from the vast majority of acute secondary care units (n = 239) that admit acute COPD patients in the UK responded to a survey of EDS including nine quality standards determined by a steering group of experts.

Results: The availability of EDS has improved from 45% of units to 59% over the last 5 years, although this is not always available across all sites within each unit. A median of 125 patients were entered onto each scheme in the previous 12 months, a modest increase from 112 in 2003. 65% of EDS operated 5 days per week with just under a quarter working all week long. The type of EDS is heterogeneous, with only approximately half of schemes offering a prevention of admission component. Almost a quarter of EDS have no direct involvement from a respiratory consultant and are mostly run by specialist nurses. General practitioners and district nurses are only involved directly in 6% and 10% of schemes, respectively. EDS standards of care are generally high in terms of criteria-based acceptance, training of staff, written protocols of care and communication with primary care. In contrast, only 39% of schemes fully meet the standard for the provision of written information to patients and carers and one-third do not collect continuous data and audit outcomes.

Conclusion: There has been an increase in EDS offered by units within the UK since 2003 but over 40% of units still do not offer this service. Many of the quality standards are met by the majority of units but there are particular deficiencies in the provision of written information to patients and in the audit of practice.



Abstract S18 Figure

Improving outcomes after thoracic surgery and lung transplant

S18 LONGITUDINAL ASSESSMENT OF PEPSIN LEVELS IN LUNG ALLOGRAFTS SUGGESTS ASPIRATION IS AN ONGOING INJURY, WHICH CAN OCCUR EARLY FOLLOWING LUNG TRANSPLANTATION

R Stovold, IA Forrest, DM Murphy, GE Johnson, J Lordan, AJ Fisher, PA Corris, JP Pearson, C Ward. Newcastle University, Newcastle upon Tyne, UK

Introduction: Aspiration may contribute to non-alloimmune lung allograft injury and eventual graft loss. Medical and surgical interventions have been advocated including fundoplication, but there is no current consensus about when this should be carried out. Biomarker approaches, including measuring pepsin¹ and bile salts² have been proposed to document aspiration and may potentially inform treatment, but there are few longitudinal studies.

Hypothesis: Pepsin is present in serial bronchoalveolar lavage (BAL) samples from lung allograft recipients. High levels early post-lung transplant may be a practicable guide/rationale for early therapeutic intervention.

Methods: Ten lung allograft recipients without bronchiolitis obliterans syndrome (three male, median age 43 years, range 20–61, two with an episode of clinical infection, one aspergillus and one pneumococcus) underwent longitudinal bronchoscopy and standardised BAL with transbronchial biopsy to assess rejection. BAL samples taken at one week, one month, 3 months, 6 months and a year were analysed for pepsin using an ELISA specific for pepsin.

Results: Pepsin was detectable in variable amounts in all patients including high levels early posttransplantation. The figure plots this, and broken lines highlight three patients with early elevated levels. These three patients also had clinically significant (A2) acute vascular rejection, concordant with elevated pepsin, but no evidence of clinical infection. There was a trend towards higher pepsin levels (mean ± SEM) in patients with early A2 or greater rejection 26.7 ng/ml (±8.2), compared with patients with lesser grades of rejection 14.9 ng/ml (±3.3), p = NS.

Conclusions: Aspiration may be an ongoing injury to lung allografts. High levels of pepsin, detectable in some individuals early posttransplantation suggest a need to consider early treatment interventions. This is supported by other clinical work in progress within our group. Our observation of concordant high pepsin levels with clinically significant acute rejection implies that aspiration may significantly contribute to an injury pattern previously attributed solely to alloimmune injury.

1. Stovold R, et al. *AJRCCM* 2007;175:1298–303.
2. D'Ovidio F, et al. *Am J Trans* 2006;6:1930–8.

S19 QUALITATIVE AND QUANTITATIVE ASSESSMENTS OF ASPIRATION IN THE IMMEDIATE POST-LUNG TRANSPLANTATION PERIOD

¹AGN Robertson, ¹SM Griffin, ²C Ward, ³JP Pearson, ⁴AJ Bredenoord, ⁵JH Dark, ²AJ Fisher, ²J Lordan, ²PA Corris. ¹Northern Oesophago-Gastric Unit, Royal Victoria Infirmary, Newcastle upon Tyne, UK; ²Immunobiology and Transplantation Group, Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, UK; ³Institute of Cellular and Molecular Biosciences, Newcastle University, Newcastle upon Tyne, UK; ⁴Department of Gastroenterology, Sint Antonius Hospital, Nieuwegein, The Netherlands; ⁵Department of Cardiothoracic Surgery, Freeman Hospital; Immunobiology and Transplantation Group, Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, UK

Introduction: Gastric aspiration has been shown to occur in lung transplant recipients and is often asymptomatic. Aspiration has been associated with bronchiolitis obliterans syndrome and anti-reflux surgery has been shown to be beneficial in this patient population. The indications and optimal timing of surgery and the best method to quantify reflux presaging aspiration are poorly defined.