current smokers. Anxiety and depression may be risk factors linking socioeconomic status and smoking status, especially in women. This paper gives an insight into why some patients with COPD continue to smoke. Health providers should note these factors when running smoking cessation services.

P7 DOES INTENSE EDUCATION OF NURSING STAFF MAKE AN IMPACT ON SMOKING CESSATION ADVICE GIVEN TO INPATIENTS?

HS Hill, S Direkze, S Hussein, N Barmania, JT Samuel, DK Mukherjee, B Yung. *Basildon and Thurrock University Hospitals NHS Foundation Trust, Basildon, Essex, UK*

Background: Smoking cessation advice is often neglected in secondary level care. Inpatient smoking cessation counsellors are often unavailable. We wanted to establish whether intensive smoking cessation training for nurses in targeted acute medical wards affected the quality of smoking cessation advice given.
Method: In May 2007 a snapshot survey of inpatients and staff was performed before England became smoke free. This addressed smoking status of patients and staff, awareness of smoking cessation services and delivery of smoking cessation advice. In June 2008 the nursing staff on three targeted medical wards (respiratory, cardiology, endocrine) were given 3 weeks of intense training on smoking cessation practice and these wards were surveyed a month later to assess the impact.
Results: 537 patients and staff were surveyed in 2007, of which 93 (17%) were smokers. In 2008, 99 patients and staff were surveyed on the three wards, of which 26 (27%) were smokers. All the patients were adults. In both surveys female smokers were the majority, 56% and 65%, respectively, for both years. In 2007 only 31% of patients received smoking cessation advice during admission, in 2008 this was 88%. Moreover in 2008, 47% of the smoking cessation advice given was by nurses compared with none in 2007. There was no significant difference in the number of smokers wanting to quit in 2007 and 2008 (67% and 69%, respectively). Paradoxically, when questioned about referral to smoking cessation services only 23% requested referral in 2008 compared with 52% in 2007.
Conclusion: This survey demonstrates that intense education of nursing staff can have an impact on smoking cessation advice given on medical wards. Whether this effect will continue is being studied. The availability of an inpatient smoking cessation counsellor to educate staff in hospital and patients may be of benefit.

P8 RESULTS OF THE THIRD BTS NATIONAL SURVEY OF SMOKING CESSATION SERVICES

[1]L McAlpine, [2]KE Lewis, [3]R Sharrock, [3]RJ Allcock, [4]BTS Tobacco Committee. *[1]Monklands Hospital, Airedale, UK; [2]Prince Philip Hospital, Llanelli, UK; [3]Queen Elizabeth Hospital, Gateshead, UK; [4]British Thoracic Society, London, UK*

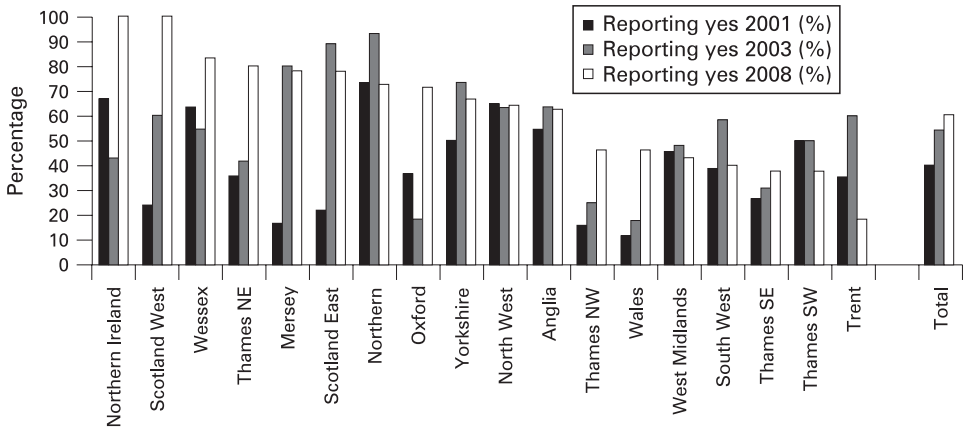
Background: In 2001 and 2003 the BTS surveyed the provision of smoking cessation services in UK hospitals. We carried out a third survey in January 2008.
Methods: A short paper questionnaire was posted to a nominated chest physician at all 261 hospitals in the UK at the end of December 2007 together with a stamped return envelope. Physicians were asked to indicate whether their hospital has a smoking cessation specialist or had access to community-based smoking cessation services. Supplementary questions explored whether the specialist was full or part-time, what follow-up was offered and what outcomes were recorded. Surveys were returned to the authors in early 2008.
Results: The overall response rate (68.6%) was lower than in the previous surveys (83%, 2001; 90.8%, January 2003). Those responding reported an overall increase in the number of smoking cessation services in UK hospitals, although marked regional differences persist (ranging from 100% of hospitals providing a service to only 20% provision) and some had lost their service. The figure shows the proportion of respondents in each health region who answered ''yes'' to the question: ''Is there a smoking cessation counsellor/officer/nurse in your hospital?''
Conclusions: Provision of hospital-based smoking cessation services has improved in the UK but there are still areas where provision is suboptimal.

Lung infection

P9 ARE RESPIRATORY PHYSICIANS BETTER AT DISCHARGING PATIENTS WITH COMMUNITY-ACQUIRED PNEUMONIA?

T Bewick, VJ Cooper, WS Lim. *Nottingham City Hospital, Nottingham, UK*

Introduction: We aimed to evaluate whether patients with non-severe community-acquired pneumonia (CAP) have a shorter length of stay (LOS) when initially seen by a respiratory physician compared with a non-respiratory physician.
Methods: At Nottingham City Hospital, following triage, acute medical patients who are not severely ill and therefore likely to have a short LOS are admitted to the consultant-led emergency short stay unit (ESSU). Records of patients seen on ESSU between



Abstract P8 Figure Is there a Smoking Cessation Counsellor in your hospital?

January 2004 and December 2007 with a clinical discharge code of "any respiratory tract infection" were examined. Patients who had CAP were grouped depending on whether they had seen a respiratory (group A) or non-respiratory (group B) consultant physician on the ESSU post-take ward round. Patients with empyema, post obstructive pneumonia due to lung cancer and immunosuppression due to haematological malignancy were excluded. Patients with a diagnosis of cellulitis over the same time period were used as controls.

Results: 1093 patients were admitted with respiratory tract infections and 1117 with cellulitis over the study period. CAP was diagnosed and treated in 499. 30 patients met the exclusion criteria and were omitted from further analysis. Patients discharged by the registrar before seeing a consultant (46 CAP, 173 cellulitis) and patients admitted over a weekend (128 CAP, 281 cellulitis) were also excluded. The LOS for patients with CAP in group A (n = 116, median 2.04 days; interquartile range (IQR) 0.98–4.62) was significantly shorter compared with patients in group B (n = 179, median 2.84 days; IQR 1.11–5.95; $p<0.05$). There was a trend towards a higher percentage of discharges on day one in group A (40.5% vs 36.8%, $p = 0.53$). There was no significant difference between the two groups with cellulitis in LOS (group A n = 231, median 2.86 days (1.32–6.15); group B n = 432, 2.63 days (1.12–6.10), $p = 0.21$) or percentage discharged on day one (24.7% vs 31.5%, $p = 0.07$).

Conclusion: Patients with CAP who are not severely ill have a shorter hospital LOS when initially seen by a respiratory compared with non-respiratory physician. This has implications for service delivery in acute medical units.

P10 ADMISSION HYPOGLYCAEMIA IS AN INDEPENDENT MARKER OF ADVERSE OUTCOME IN PATIENTS ADMITTED WITH COMMUNITY-ACQUIRED PNEUMONIA

A Singanayagam, JD Chalmers, AT Hill. *Department of Respiratory Medicine, Royal Infirmary of Edinburgh, Edinburgh, UK*

Introduction and Objectives: Both hypoglycaemia and hyperglycaemia have been shown to be associated with adverse outcomes in patients with septicaemia. The aim of this study was to investigate whether admission hypoglycaemia and hyperglycaemia were associated with poor outcome in patients admitted with community-acquired pneumonia (CAP).

Methods: A prospective observational study of 914 patients presenting with CAP over a 3-year period. Plasma glucose was measured on admission in all patients with division into three groups: hypoglycaemic (plasma glucose <4.4 mmol/l), plasma glucose 4.4–13.9 mmol/l and hyperglycaemic as defined in the pneumonia severity index (plasma glucose >13.9 mmol/l). Patients on systemic steroids were excluded. Outcomes of interest were 30-day mortality and the need for mechanical ventilation and/or inotropic support.

Results: Of 914 patients studied, 54 were hypoglycaemic at presentation, 30 were hyperglycaemic and 830 had glucose ranging from 4.4 to 13.9 mmol/l. 106 patients had a pre-existing diabetes mellitus diagnosis and of these, four were hypoglycaemic at presentation and 24 were hyperglycaemic.

For All Patients: 30-day mortality rates were 29.6% in the hypoglycaemic group, 16.7% in the hyperglycaemic group and 8.1% in the glucose 4.4–13.9 mmol/l group. The need for mechanical ventilation and/or inotropic support was 35.2% in the hypoglycaemic group, 20% in the hyperglycaemic group and 8.7% in the glucose 4.4–13.9 mmol/l group. For the subgroup without pre-existing diabetes: 30-day mortality rates were 30.0% in the hypoglycaemic group, 33.3% in the hyperglycaemic group and 7.3% in the glucose 4.4–13.9 mmol/l group. The need for mechanical ventilation and/or inotropic support was 38.0% in the hypoglycaemic group, 33.3% in the hyperglycaemic group and 8.1% in the glucose 4.4–13.9 mmol/l group. On multivariate analysis adjusting for age, sex, co-morbidities including diabetes and pneumonia severity (CURB65), hypoglycaemia was significantly associated with increased 30-day mortality and the need for mechanical and/or inotropic support but hyperglycaemia was not associated with either outcome (see table).

Conclusion: Admission hypoglycaemia is associated with increased severity in patients with CAP, independent of pre-existing diabetes. Admission hyperglycaemia did not correlate with poor outcome in our cohort. There were, however, only small numbers in this group that did not have a previous history of diabetes.

P11 ATTEMPTED ERADICATION OF *PSEUDOMONAS AERUGINOSA* IN PATIENTS WITH NON-CYSTIC FIBROSIS BRONCHIECTASIS FOLLOWING INTRAVENOUS ANTIBIOTICS AND NEBULISED COLOMYCIN

J Stowell, M Nisbet, R Wilson. *Royal Brompton Hospital, London, UK*

Background: Patients with bronchiectasis who are colonised with *Pseudomonas aeruginosa* (PA) have reduced quality of life and more frequent exacerbations. Eradication can be difficult and optimal therapy is not well defined. The aim of this study of patients with bronchiectasis with PA isolated from sputum who were admitted for intravenous treatment was to determine the frequency of prolonged eradication and predictors of success.

Methods: A review of consecutive patients admitted following a first isolate of PA between 2003 and 2007 was performed. Clinical characteristics, lung function, treatment and clinical outcome were reviewed.

Results: Thirty-three patients were identified; eight (24%) male, mean age was 47.5 years (16.8 SD). 28 (85%) patients had failed initial treatment with oral ciprofloxacin. The mean duration of anti-pseudomonal intravenous antibiotic treatment was 10 days (1 SD) and 32 (97%) patients were treated with nebulised colomycin for 1 month after discharge. At 12 months 13 (39%) patients remained culture negative for PA and 10 (30%) patients had sustained eradication for the duration of follow-up, which included regular surveillance. The mean length of follow-up was 2.6 years (1.2 SD). The mean FEV_1 in the cohort with sustained eradication was 78.2% compared with 68.7% ($p = 0.04$). Age, sex, smoking

Abstract P10 Table Multivariate analysis of admission hypoglycaemia and hyperglycaemia for outcomes of 30-day mortality and need for mechanical ventilation and/or inotropic support

	30-Day mortality		Need for mechanical ventilation and/or inotropic support	
	OR (95% CI)	p Value	OR (95% CI)	p Value
Hyperglycaemic (n = 30)	1.48 (0.46 to 4.72)	0.51	1.63 (0.51 to 5.26)	0.41
Hypoglycaemic (n = 54)	5.19 (2.48 to 10.90)	<0.0001	3.43 (1.69 to 6.97)	0.0006

OR, odds ratio.

history, sinusitis, mucoid PA strain or time from PA isolation to admission did not influence success of eradication. Following intravenous treatment there was only one admission in the sustained eradication group compared with 14 admissions in the remaining patients in the follow-up period ($p = 0.04$).

Conclusions: Intravenous treatment followed by nebulised colomycin resulted in a sustained period of PA eradication in 30% of non-cystic figrosis bronchiectasis patients. FEV_1 was an important predictor of successful eradication. Successful PA eradication was associated with a reduction in hospital admissions.

P12 OUTCOMES OF EXACERBATIONS OF NON-CYSTIC FIBROSIS BRONCHIECTASIS REQUIRING INTRAVENOUS ANTIBIOTICS: INFLUENCE OF PATHOGENIC ORGANISM

MP Murray, K Turnbull, S MacQuarrie, AT Hill. *Department of Respiratory Medicine, Royal Infirmary of Edinburgh, Edinburgh, UK*

Aim: The aim of the study was to determine whether the pathogenic organism isolated at the start of the exacerbation influenced the outcome, in patients requiring intravenous antibiotic therapy.

Methods: Patients requiring intravenous antibiotics between November 2006 and March 2008 were included. We compared those that cultured *Pseudomonas aeruginosa* with other potential pathogenic organisms (PPM) at the start of the exacerbation. Outcomes used to assess response included FEV_1, FVC, incremental shuttle walk test, serum erythrocyte sedimentation rate, C-reactive protein, total white cell count, qualitative sputum microbiology, 24-h sputum volume and purulence, Leicester cough questionnaire and St George's respiratory questionnaire.

Results: 19 patients isolated *P aeruginosa* and 13 isolated other PPM: *Haemophilus influenzae* (n = 4); *Streptococcus pneumoniae* (n = 3); *Staphylococcus aureus* (n = 2); *Moraxella catarrhalis* (n = 2); *Escherichia coli* (n = 1); *Serratia* species (n = 1). With 2 weeks of intravenous antibiotic therapy, both groups had significant improvements in all parameters except for FEV_1 and FVC, which only improved in the group with other PPM. The reason for the lack of improvement in FEV_1 and FVC in patients with *P aeruginosa* may reflect the poorer bacterial clearance in this group of patients. The table shows the endpoints at the start and end of the exacerbation for each group.

Conclusion: Independent of the pathogenic organism, antibiotic therapy improved bacterial clearance, 24-h sputum volume, exercise tolerance, systemic inflammatory markers and health-related quality of life. There was less bacterial clearance and a poor response of FEV_1 and FVC, however, in patients with *Pseudomonas aeruginosa*.

P13 THE LEICESTER COUGH QUESTIONNAIRE IS A USEFUL MARKER OF DISEASE SEVERITY IN NON-CYSTIC FIBROSIS BRONCHIECTASIS

MP Murray, K Turnbull, JL Pentland, AT Hill. *Department of Respiratory Medicine, Royal Infirmary of Edinburgh, Edinburgh, UK*

Aim: The aim of the study was to establish the usefulness of a cough severity score using the Leicester cough questionnaire (LCQ) as an indicator of disease severity in non-cystic fibrosis bronchiectasis.

Methods: Patients with mild and severe bronchiectasis completed the LCQ when clinically stable. 25 patients from each group repeated the questionnaires at 6 months to assess test reproducibility. The LCQ ranges from 3 to 21, with a lower score indicating more severe cough. Criteria for mild bronchiectasis included: not regularly expectorating sputum or expectorating only mucoid sputum when stable; requiring $\leqslant 3$ courses of antibiotics in the preceding 12 months for chest infections; evidence of cylindrical bronchiectasis in $\leqslant 3$ lobes on HRCT chest scan; no evidence of chronic sputum colonisation (chronic sputum colonisation defined as pathogenic bacteria cultured $\geqslant 2$ sputum samples when clinically stable in the preceding 12 months). Criteria for severe bronchiectasis included: expectorating purulent sputum when stable; minimum requirement of at least three lobes involved, with evidence of varicose or cystic bronchiectasis in at least one lobe on HRCT chest scan; evidence of chronic sputum colonisation.

Results: 91 patients participated. 40 had mild bronchiectasis and 51 had severe bronchiectasis. The median (interquartile range) total LCQ score in the mild group was 20.2 (17.8–20.9) and 13.6 (10.4–16.2) in the severe group, $p<0.001$. In addition, there was a significant difference between the mild and severe groups in all domains of the LCQ (see table). The LCQ total score was reproducible over 6 months in both groups; mean difference $\pm$ SD between the two scores was -0.04 ± 1.3 (mild group) and -0.4 ± 1.0 (severe group).

Conclusion: The LCQ is a reproducible and useful marker of disease severity in non-cystic fibrosis bronchiectasis.

Abstract P13 Table The Leicester cough questionnaire in mild and severe bronchiectasis

Domain	Mild group n = 40	Severe group n = 51
Physical	6.4 (5.5–6.9)	4.4 (3.4–5)*
Psychological	7.0 (6.4–7.0)	4.4 (3.3–5.3)*
Social	7.0 (6.3–7.0)	4.5 (3.5–6.0)*
Total	20.2 (17.8–20.9)	13.6 (10.4–16.2)*

*$p<0.001$; Data presented as median (interquartile range).

Abstract P12 Table Endpoints at the start and end of the exacerbation for each group

Variable	Exacerbation start (PA) N = 19	End exacerbation (PA) N = 19	p Value	Start exacerbation (other PPM) N = 13	End exacerbation (other PPM) N = 13	p Value
24-h Sputum volume (ml)	24.3 ± 22.0	6.1 ± 5.3	0.005	39.5 ± 19.4	11.3 ± 10.8	0.001
FEV_1 (l)	1.52 ± 0.61	1.53 ± 0.58	0.9	1.32 ± 0.48	1.51 ± 0.61	0.01
FVC (l)	2.38 ± 0.88	2.44 ± 0.81	0.3	2.25 ± 0.62	2.58 ± 0.96	0.02
Exercise capacity (m)	226 ± 161	285 ± 177	<0.001	188 ± 184	234 ± 198	0.03
ESR (mm/h)	36.8 ± 30.0	21.2 ± 13	<0.001	47.5 ± 26.2	22.7 ± 16.4	0.02
CRP (mg/l)	49.7 ± 72.4	4.8 ± 4.1	0.02	91.9 ± 62.6	11.1 ± 16.7	<0.001
WCC ($\times 10^9$) (range 4–11)	10.2 ± 3.6	6.5 ± 1.8	<0.001	12.2 ± 3.7	8.3 ± 3.0	0.01
LCQ (total score)	12.0 ± 2.6	16.9 ± 2.8	<0.001	10.8 ± 3.5	16.0 ± 4.2	0.001
SGRQ (total score)	56.7 ± 16.7	46.9 ± 19.7	<0.001	59.5 ± 19.1	44.2 ± 21.1	<0.001
No of patients with pathogens	19/19	7/19	<0.001	13/13	0/13	<0.001

CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; LCQ, Leicester cough questionnaire; PA, *P aeruginosa*; PPM, potential pathogenic organisms; SGRQ, St George's respiratory questionnaire; WCC, white cell count.

P14 SUCCESSFUL TREATMENT OUTCOMES IN THREE CASES OF DISSEMINATED BCG INFECTION

DG Wootton, N Parr, JA Corless. *Wirral University Teaching Hospital, UK*

Introduction: Intravesical bacille Calmette–Guerin (BCG) is the treatment of choice for stage G3T1 and carcinoma in-situ, transitional cell carcinoma of the urinary bladder.[1] However, a rare complication is widespread dissemination of BCG leading to respiratory compromise and multiple organ dysfunction, a syndrome called BCG sepsis.[2] We report three cases of BCG sepsis, their clinical features and successful treatment.

Cases: Two men and one woman aged 62, 73 and 71 years, respectively, presented with severe systemic illness commencing within hours of receiving intravesical BCG. In each case the presenting syndrome included fever, rigors and malaise. All were pyrexial, had haemodynamic compromise and crackles heard in the chest despite normal plain chest radiographs. Liver and renal biochemistry was abnormal. Both men developed respiratory distress soon after admission. The first had a chest computed tomography (CT) scan that showed miliary nodules throughout both lungs and enlarged supraclavicular fossa nodes. Video-assisted thorascopic (VAT) biopsy of his lung revealed multiple epitheliod-rich granulomas with central necrosis. The second man's CT showed ground glass shadowing in peripheral and peri-bronchovascular areas, with consolidation in the subpleural region of the left lower lobe. In the female case hepatitis predominated. Liver ultrasound was normal and liver biopsy revealed a lymphohistiocytic infiltrate and non-specific features of chronic hepatitis. In all three cases, organisms could not be identified by microscopy or culture of any of the respiratory, urinary or biopsy samples. All three patients were commenced on antituberculous therapy with rifampicin, isoniazid and ethambutol at equivalent doses to those used in tuberculosis along with prednisolone 20 mg once a day for 4 weeks. At 6 months all patients had made a complete recovery and this has been sustained at one year.

Discussion: BCG sepsis is a little known, life-threatening complication of a widely used therapy. The syndrome can include a granulomatous lung infiltrate.[3] 6 months of treatment with rifampicin, isoniazid and ethambutol is effective. Pyrazinamide is ineffective against BCG.[2] Prednisolone is used as an initial adjunct to therapy as hypersensitivity is thought to play a role in the initial sepsis syndrome. We would advocate the generation of a BCG sepsis management protocol in units offering this therapy.

1. **Koya MP,** Simon MA, Soloway MS. Complications of intravesical therapy for urothelial cancer of the bladder. *J Urol* 2005;**175**:2004–10.
2. **Lamm DL,** van der Meijden APM, Morales A, *et al*. Incidence and treatment of complications of bacillus Calmette–Guerin intravesical therapy in superficial bladder cancer. *J Urol* 1992;**147**:596–600.
3. **Kesten S,** Title L, Mullen B, *et al*. Pulmonary disease following intravesical BCG treatment. *Thorax* 1990;**45**:709–10.

P15 CAN SPUTUM COLOUR PREDICT BACTERIAL COLONISATION, SEVERITY AND QUALITY OF LIFE IN STABLE NON-CYSTIC FIBROSIS BRONCHIECTASIS?

MP Murray, JL Pentland, K Turnbull, S MacQuarrie, AT Hill. *Royal Infirmary of Edinburgh, Edinburgh, UK*

Aim: The aim of the study was to determine whether sputum colour can predict bacterial colonisation, severity and quality of life in stable non-cystic fibrosis bronchiectasis.

Methods: This was a prospective cohort study from December 2006 to April 2008 of patients attending the bronchiectasis clinic. For the study, all patients collected their sputum on the morning of the clinic appointment and the appearance was documented as mucoid, mucopurulent or purulent by the doctor. FEV_1 and FVC was measured and the St George's respiratory questionnaire (SGRQ) completed. The sputum was processed for qualitative bacterial culture. The severity of bronchiectasis was determined radiologically assessing number of lobes involved and presence or absence of cystic bronchiectasis. Only clinically stable patients (ie, no requirement for antibiotics in the preceding 4 weeks) were included. Current smokers, patients with chronic obstructive pulmonary disease and FEV_1 <60% predicted, patients with asthma as the principal diagnosis and those on long-term antibiotics were excluded from analysis. Fisher's exact test, one-way analysis of variance and the Mann–Whitney U test were used for statistical analysis.

Results: There were 146 patients: mucoid (n = 20), mucopurulent (n = 66) and purulent (n = 60). 86.8% of purulent sputum samples had bacteria isolated on culture, compared with 45.4% of mucopurulent sputum samples ($p = 0.001$) and only 5% of mucoid sputum ($p<0.001$). The spirometry, degree of bronchiectasis and SGRQ is shown in the table. Patients with purulent sputum had worse FEV_1 ($p = 0.01$) and FEV_1/FVC ($p = 0.03$) and more severe bronchiectasis radiologically, compared with patients with both mucopurulent and mucoid sputum ($p = 0.03$). Patients with mucopurulent sputum had more severe bronchiectasis radiologically compared with patients with mucoid sputum ($p = 0.03$) but had similar spirometry ($p = 0.2$). The SGRQ score was only worse comparing patients expectorating purulent sputum with patients expectorating mucoid sputum ($p = 0.03$).

Conclusion: Assessment of sputum colour can help predict bacterial isolation, severity and quality of life in stable non-cystic fibrosis bronchiectasis.

Abs P15 Table The relationship between sputum colour and lung function, health-related quality of life and radiological disease severity

Variable mean ± SD	Mucoid sputum	Mucopurulent sputum	Purulent sputum
Number	20	66	60
FEV_1 (l/min) (% predicted)	1.79 ± 0.81 (77 ± 25)	1.99 ± 0.75 (78.2 ± 24.3)	1.62 ± 0.51*† (65 ± 22)
FVC (l/min) (% predicted)	2.95 ± 0.82 (85 ± 18)	3.25 ± 1.1 (87.4 ± 20)	3.3 ± 0.84*† (78.8 ± 17.7)
FEV_1/FVC	0.74 ± 0.16	0.72 ± 0.21	0.65 ± 0.15*†
Total SGRQ score (units)	31.5 ± 19.7	36.3 ± 20.7	44.1 ± 21.2*
Number of lobes involved	3.0 ± 1.6	3.4 ± 1.5	4.0 ± 1.5*†
% With cystic bronchiectasis	0	20.7‡	45.3*†

*p<0.05 when comparing purulent sputum with mucoid sputum; †p<0.05 when comparing purulent sputum with mucopurulent sputum; ‡p<0.05 when comparing mucopurulent sputum with mucoid sputum. SGRQ, St Georges's respiratory questionnaire.

P16 IS THE USE OF QUINOLONE ANTIBIOTICS FOR THE TREATMENT OF RESPIRATORY TRACT INFECTIONS ASSOCIATED WITH AN INCREASED RISK OF *CLOSTRIDIUM DIFFICILE*-ASSOCIATED DISEASE?

A Khan, L Cottle, A Kerry, N Moodi, K Samji, M Furtado, A Colville, B Patel. *Royal Devon and Exeter NHS Foundation Trust, Exeter, UK*

Background: Broad-spectrum antibiotics are associated with the development of *Clostridium difficile*-associated disease (CDAD), an important cause of morbidity and mortality in hospital inpatients. The quinolone antibiotic moxifloxacin was introduced onto the formulary of our institution in August 2004 as first-line treatment for severe community-acquired pneumonia. A severe outbreak of CDAD occurred between November 2004 and June 2005. The aim of this study was to assess if this outbreak was associated with the use of quinolone antibiotics for the treatment of respiratory tract infections (RTI).
Study Design: Matched case–control study.
Methods: All cases of CDAD during the period December 2004 to January 2005 were identified by the microbiology department. Controls were identified from discharge summary codes that indicated the patient had been treated for an infective illness for which they were likely to have received antibiotics. Controls were matched to cases by ward and by date of discharge. When possible, up to four controls were identified for each case.
Results: 45 cases and 165 controls were included in the analysis. A greater proportion of cases received a quinolone (80%) than controls (49.4%, $p \leqslant 0.001$) and more cases received multiple antibiotics ($\geqslant 3$ different antibiotic classes) than controls (48.9% vs 15.3%, $p \leqslant 0.001$). Significantly fewer cases were treated for RTI (40%) than controls (57.9%, $p<0.05$). In matched analyses, treatment with a quinolone for any infection was associated with an increased risk of CDAD (odds ratio (OR) 5.3, $p \leqslant 0.001$) as was receiving multiple antibiotics (OR 5.1, $p \leqslant 0.001$). Patients treated for a RTI had a significantly lower risk of CDAD than patients treated for other infections (OR 0.43, $p<0.05$). However, in individuals treated for a RTI, receiving multiple antibiotics increased the risk of CDAD (OR 3.3, $p<0.05$) and there was a trend towards increased risk with quinolone antibiotics (OR 5.3, $p = 0.1$).
Conclusions: The use of quinolone antibiotics and multiple antibiotics is associated with an increased risk of CDAD. The increase in CDAD seen at our hospital cannot be solely attributed to the addition of quinolone antibiotics to the hospital guidelines for the treatment of RTI.

P17 PREDICTORS FOR RECURRENT ADMISSIONS WITH AN EXACERBATION OF NON-CYSTIC FIBROSIS BRONCHIECTASIS

GB Jifon, B Ziso, E Lochhead, V Ford, RPD Cooke, PP Walker. *Aintree Chest Centre, University Hospital Aintree, Liverpool, UK*

Exacerbations of adult non-cystic fibrosis (CF) bronchiectasis are burdensome to patients and impact health status. Hospitalisation is expensive, inconvenient and potentially exposes patients to pathogenic bacteria. To examine strategies to reduce hospitalisation we looked at factors associated with recurrent admissions. We retrospectively examined the case notes of 55 patients hospitalised with acute exacerbations of bronchiectasis (AEB) over a one-year period. All patients had previously been diagnosed with non-CF bronchiectasis confirmed on HRCT. At the time of the study we had minimal access to home intravenous antibiotic therapy.

Fifty-five patients (27 male, mean age 72 years) had 85 admissions. Thirty-eight (69%) patients admitted on one occasion were compared with 17 (31%) patients admitted on two or more occasions (range 2–5). Factors potentially associated with recurrent admissions are shown in the table. Patients admitted on more than one occasion were more likely to have poor lung function (FEV_1) ($p = 0.036$) and to be taking inhaled corticosteroids (ICS) ($p = 0.012$).

Abstract P17 Table Characteristics of patients with single or recurrent admissions over one year

	Admissions per year		
	One (n = 39)	Two or more (n = 17)	p Value*
Mean age (SD)	72 (13)	72 (12)	0.94
Mean FEV_1 (l) (SD)	1.19 (0.66)	0.91 (0.26)	0.036
Mean FEV_1/FVC% (SD)	59.3 (17)	52.1 (16.8)	0.42
Male, n (%)	16 (42.1)	11 (64.7)	0.12
Active/ex-smoker, n (%)	29 (76.3)	11 (64.7)	0.51
Inhaled corticosteroids, n (%)	23 (60.5)	16 (94.1)	0.012
Previous pseudomonas, n (%)	11 (28.7)	6 (35.3)	0.63
Bilateral bronchiectasis on CT, n (%)	22 (57.9)	13 (76.9)	0.18
Emphysema on CT, n (%)	12 (31.6)	6 (35.3)	0.79

*t Test for means and χ^2 for proportions. CT, computed tomography.

Recurrent admissions with AEB were influenced by lung function impairment, probably reflecting further physiological compromise at the time of the exacerbation and/or the ability to cope with increased symptoms. The association with ICS is likely to reflect the severity of airflow obstruction but could represent an increased infection risk. Strategies to reduce decline in lung function may have an impact on hospitalisation rates.

P18 SPECTRUM OF INVASIVE FUNGAL DISEASE IN A TEACHING HOSPITAL

[1]W Perera, [1]P Panesar, [1]V Gant, [2]J Brown. *[1]University College London Hospital, London, UK; [2]Centre for Respiratory Research, Rayne Institute, UCL, London, UK*

Introduction: Invasive fungal infections (IFI) often affect the lungs and are an increasingly important cause of morbidity and mortality for hospital patients. Respiratory physicians are frequently involved in the management of suspected IFI, but confirming the diagnosis can be difficult and potentially toxic and expensive systemic antifungal therapies (SAT) are often prescribed empirically. We have therefore retrospectively assessed patients with IFI treated at our teaching hospital in order to define the spectrum of disease seen, the certainty of the diagnosis and the costs involved.
Methods: All adults (>16 years) prescribed SAT (amphotericin, ambisome, caspofungin and voriconazole) between April 2007 and March 2008 were identified from the pharmacy issuing log, which also provided data on the cost of treatment. Demographic and clinical data, including positive microbiological, histological and cytological samples, were obtained from the electronic patient records.
Results: 172 (43% female) patients (median age 44 years, interquartile range 28–58) were prescribed SAT for IFI during this 12-month period. The underlying diseases were: haematological conditions 79% (AML 28%, ALL 16%, lymphoma 27%, other 8%; 32% had had a bone marrow transplant); critical illness 9%; non-haematological malignancy 7%; other 3% (HIV, CGD and cystic fibrosis). Results of investigations included: positive cultures 20%; positive cytology 2%; positive histology 3%. Bronchoscopies were performed in 11% of patients and a further 2% of patients had surgical lung biopsies, with positive samples in 21%. The spectrum of IFI were: invasive candidiasis 23 (13%); probable invasive pulmonary aspergillosis eight (5%); confirmed invasive aspergillosis two (1.2%, one sinus and one lung); chronic necrotising invasive aspergillosis three (2%); disseminated histoplasmosis, nasal *Mucor*, cryptoccocal meningitis, *Fusarium* and *Rhodoturula* sepsis one (0.6%) each. In 76% of patients the diagnosis of IFI was unconfirmed. By

31 March 2008 42 (24%) patients had died. The total cost of systemic antifungal therapies was £1 635 617, with a median cost per patient of £6019 (interquartile range £3098–£11 574, maximum £89 590).

Conclusions: IFI are a major clinical problem in our teaching hospital, causing a wide spectrum of disease and frequently targeting the lungs. The large number of cases without a confirmed diagnosis demonstrates the urgent requirement for improved investigations for IFI.

Optimising healthcare delivery in respiratory medicine

P19 EARLY DIAGNOSIS LUNG CANCER CLINIC: HALF WAY TO SUCCESS IN IMPROVING LUNG CANCER MANAGEMENT

V Dudzevicius, A Ahmad, C Fong, N Krishnaraj. *The James Cook University Hospital, Middlesbrough, UK*

Aim: To evaluate changes in performance and meeting targets in managing patients with suspected lung cancer after setting up an early diagnosis clinic—"two-week rule" (TWR) clinic.

Materials and Methods: Retrospective analysis of 210 consecutive patients who were referred with suspected lung cancer. Study period was January 2007 to April 2007 (pre-TWR clinic) and May 2007 to August 2007 (post-TWR clinic). The patients referred under TWR and non-TWR were compared. Different pathway times, type of the tests and treatments given were analysed. Statistical analysis was done using SPSS package (Chicago, USA).

Results: Analysing pathway times, no difference was found in time from referral to first seen between pre-TWR and post-TWR period, 6.3 ± 0.3 and 6.3 ± 0.4 (days, mean ± SEM, respectively). There were no breaches in "14 days target". In the TWR group times from first seen to first diagnostic test (usually computed tomography; CT), between first and second diagnostic test (usually bronchoscopy/CT FNA; improved in the non-TWR group also), from first seen to definitive diagnosis have significantly improved after the clinic was set up (see table). If the second test was non-diagnostic and additional testing was required this resulted in significant delay from first seen to definitive diagnosis compared with other patients—35.6 ± 4.6 and 7.8 ± 1.3 (days, mean ± SEM, respectively). Similar findings were in the non-TWR group. It also prolonged time from referral to first treatment given. There was no improvement in time from referral to first treatment given after the TWR clinic was set up (see table). One "62-days target" breach pre-TWR and two breaches post-TWR clinic were detected. Shortest time to first treatment was found if palliative treatment was considered compared with surgery and chemo/radiotherapy treatment groups.

Conclusions: There was no improvement in time from referral to first seen—all patients met the 14-days target. Setting up the TWR clinic significantly reduced times from first seen in clinic to first and second test and definitive diagnosis. Need for additional testing prolonged the time to definitive diagnosis and treatment significantly. Time to first treatment given remained unchanged after the clinic reorganisation. There was no significant improvement in the pathway times in the non-TWR group, except in time from first to second diagnostic test.

P20 SELF-REPORTED GOOD PRACTICE AND INNOVATION DELIVERED BY PRIMARY CARE ORGANISATIONS FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

[1]S Barratt, [1]JW Dodd, [2]RJ Buckingham, [2]NA Pursey, [2]D Lowe, [2]CM Roberts, [2]RA Stone. *[1]Somerset Lung Centre, Musgrove Park Taunton and Somerset NHS Foundation Trust, Taunton, UK; [2]The Clinical Effectiveness and Evaluation Unit, Royal College of Physicians, London, UK*

Background: Few national data exist on the provisions of chronic obstructive pulmonary disease (COPD) services by the primary care organisations (PCO). In the national COPD audit 2008 we undertook a paper-based, self-reported survey of all 192 UK NHS PCO.

Methods: In addition to structured questions, the survey invited the PCO to share examples of good or innovative practice either in action or planned for the near future. 48% (92/192) PCO responded. The information from this free text response was collated and systematically reviewed by two independent assessors using themed analysis. Identified themes of innovative practice: to minimise hospital admission. Remote monitoring of patient symptoms via "Telehealth". Community outreach teams (mentioned 16 times). Both designed to allow early intervention in exacerbations. Another common strategy employed was the development of early discharge schemes (mentioned 13 times). Sub-theme analysis identified differences between innovations aimed at early detection of symptoms versus those aimed at admission avoidance. Service development: the development of community-based end-of-life services (mentioned 10 times). Plans for increasing community-based pulmonary rehabilitation, oxygen assessment and multidisciplinary COPD teams addressing issues such as smoking cessation. Sub-theme analysis pointed to differences between the introduction of new posts implementing a range of services, eg, community matrons versus more "singular" services such as community spirometry and oxygen assessments. Education and training: a large emphasis has been placed on educating both patients and healthcare providers (mentioned 15 times). Strategies adopted include educational audiovisual aids for patients, self-management plans and qualifications such as the COPD diploma.

Discussion: There are a number of interesting innovative concepts under development in primary care. Many involve areas of practice traditionally associated with hospital care, eg, spirometry, oxygen assessment and education and training. Most developments appear to involve only PCO working in isolation from secondary care. Evaluation and cost effectiveness of services do not merit a high profile.

Conclusion: It is encouraging to see that substantial work is being undertaken to improve clinical outcomes in COPD but it is imperative that PCO work in conjunction with secondary care to develop a coordinated approach delivering an efficient, cost-effective and holistic first-class care for our patients.

Abstract P19 Table Pathway times according to the referral type and the study period

Times analysed (days, mean ± SEM)	TWR		Non-TWR	
	Pre-TWR clinic	Post-TWR clinic	Pre-TWR clinic	Post-TWR clinic
First seen to first diagnostic test	1.6 ± 0.4	0.05 ± 0.4*	1.96 ± 1.3	2.3 ± 0.9†
First to second diagnostic test	8.9 ± 1.0	3.9 ± 1.1*	11.3 ± 2.2	4.6 ± 1.1*
First seen to definitive diagnosis	19.4 ± 2.7	10.4 ± 3.6*	11.5 ± 2.2	7.3 ± 1.6†
Referral-to-first treatment	43.1 ± 3.4	43.6 ± 4.1†	43.8 ± 3.4	26.1 ± 4.1†

*p<0.05; †NS. TWR, two-week rule.