

indicates a high relevance of the questionnaire items to the subject. At this stage, modifications have been made to eliminate ambiguity and repetition. We will now test concurrent validity, specificity and test-retest variability of the questionnaire in healthy volunteers, and respiratory patients with and without VCD.

## P228 AN AUDIT OF THE EFFECTIVENESS OF COMPETENCY BASED SPIROMETRY TRAINING

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**Introduction** The PCT had funded practice nurses to undertake formal competency based training in spirometry measurements. An audit of spirometry provision in practices within the PCT was undertaken to assess equipment, training and quality of spirometry being performed with comparison made between spirometry undertaken by trained staff (ARTP Cert) and that performed by untrained staff. The aim was to assess the effectiveness of the competency based training being funded by the PCT.

**Methods** 36 practice nurses had received training from Respiratory Physiologists based in an acute hospital trust to ARTP Full Certificate in Spirometry standards. 62 Primary Care practices were sent a questionnaire, designed by the author, and asked to supply five recent anonymous spirometry traces.

**Results** 26 practices responded (42%); 5 (19%) did not perform spirometry testing, due to a "lack of staff skills" (4/5) and "young patient population" (1/5). Of those practices performing spirometry, all were using the Care Fusion MicroLab spirometer and the following training had been undertaken; ARTP training course (16/21), drug representative training (3/21), COPD Diploma (1/21) and no response (1/21). 81% of practices performing spirometry had a calibration syringe and performed calibration either at each session or weekly. Training for the practices that did not have a calibration syringe (19%) was by; COPD Diploma (1/4) and drug representative (3/4). 18/21 practices performing spirometry sent five traces for analysis. Only 17% practices performed relaxed VC manoeuvres and of these 66% achieved acceptability criteria. 13/18 performed the recommended minimum of three FVC's (72%) with 11 of these (85%) achieving two results within 5% or 100 ml.<sup>1</sup> 5/18 did not perform a minimum of three manoeuvres (for three practices only one of the five traces met acceptability criteria, two of whom were ARTP spirometry trained). Two practices submitted five traces where none of the traces achieved the required acceptability criteria (both Drug Representative trained).

**Conclusion** Training staff to ARTP standards improves the quality of spirometry performed in primary care (when compared to other modes of training), however once training is completed, it is important to audit quality standards to ensure that they are still met.

## REFERENCE

1. ARTP/BTS Guidelines Respiratory Medicine. 1994.

## P229 FACTORS AFFECTING INHALER CHOICE AND ADHERENCE IN URBAN LIVERPOOL

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**Introduction** Salmeterol/Fluticasone propionate (SFC) in the form of a dry powder inhaler (DPI) is often used in COPD, however it is also available as a metered dose inhaler (MDI). This is unlicensed for

COPD and costs considerably more. At our hospital, a high proportion of COPD patients used SFC MDI, the reasons for this were unclear. This study aimed to investigate the effects of patient preference on inhaler adherence.

**Methods** Patients admitted to hospital with an exacerbation of COPD taking either SFC DPI or MDI were recruited. All patients completed a pre-discharge questionnaire about their inhaler usage. MDI patients were switched to DPI, following education and check of their inspiratory flow. GPs were informed that their patient was involved in a study of inhalers but not the detail of the study. All patients underwent a further questionnaire at 3 months.

**Results** 101 patients, mean (SD) age was 69 (9) years and 50% male. On admission, 66 (65%) on MDI, 35 (35%) on DPI. 100% of MDI patients were switched to DPI. At 3 months, follow-up data were available on 81 patients. Of those patients admitted on DPI, 26/29 (92%) remained on it and were satisfied with it. In the group switched from MDI to DPI, 26/52 (50%) were again receiving MDI at 3 months. 16 patients had asked for their prescription to be changed back. 10 patients had their prescription changed without their knowledge or did not receive DPI on discharge. Regardless of the reasons for the switch, 18 patients stated they preferred MDI over DPI. Reasons why patients requested the change back to MDI included dry powder irritating the throat, dry mouth and the inhaled dose not going into the lungs.

**Conclusion** Following a relatively simple intervention 50% of COPD patients using SFC MDI could be switched and maintained on SFC DPI. Factors relating to a return to MDI included patient related and organisational factors. A whole system approach is required to effect robust systematic change in this patient group, however approximately a third of the group switched to DPI will still request a change back to MDI.

## P230 DO WE NEED A "TWO WEEK RULE" REFERRAL PATHWAY FOR LUNG CANCER?

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**Introduction** The introduction of the two week rule (TWR) cancer referral system aimed to expedite the diagnosis and treatment of patients with lung cancer. There have been concerns that the system may even lead to delays and there remains little evidence to support its use. We therefore used prospective data to assess the effectiveness of this system.

**Methods** We prospectively collected data on patients referred in 2010 with suspected lung cancer to a large West London lung cancer centre. We evaluated final diagnosis, performance status, lung cancer staging, time until seen in specialist clinic and time until first treatment for patients referred under the TWR compared with patients referred via our in-house abnormal radiology referral service.

**Results** In total 249 patients were included in the study (181 from radiology reporting and 68 from GP referrals via the 2 week wait). 83 (33%) cancers were diagnosed from a total of 249 referrals. Patients referred from the radiology department were significantly more likely to have a diagnosis of lung cancer (73/181, 40%) than patients referred under the TWR (10/68, 15%;  $p < 0.001$ ). The mean time from date of referral to seeing a specialist was similar in both groups. All patients diagnosed with lung cancer referred through the TWR had an abnormal chest radiograph. More patients with a performance status 0–1 and earlier stage disease were referred from radiology than through the TWR.

**Conclusions** A robust radiology referral system is an effective alternative method to diagnosing lung cancer than the TWR. Patients referred from radiology are significantly more likely to have lung cancer. We propose that out-patient clinic slots are reserved for

urgent radiology referrals rather than all being allocated to TWR appointments amenable to direct GP bookings. More work is needed to develop this referral pathway further.

**P231 "SAFETY-NET" FOR ABNORMAL CHEST RADIOGRAPHS WITH A LOW INDEX OF SUSPICION FOR MALIGNANCY**

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**Introduction and Objectives** Guidelines dictate that where a chest x-ray is incidentally suggestive of lung cancer, a copy of the radiologists report is sent to a designated member of the lung cancer multidisciplinary team. A similar system was implemented for abnormal chest radiographs demonstrating significant non-malignant changes or abnormalities with a low index of suspicion of malignancy. This was used to assess if abnormal chest radiographs are adequately followed-up by the requesting clinicians.

**Methods** Reporting radiologists coded radiographs that warranted further action such as repeat imaging within a specified time frame. These were relayed to a designated coordinator. If action did not occur as suggested on the report, the requesting clinician was prompted on a weekly basis until the issue was resolved or else referred to a member of the chest team for further evaluation. At 6 months the cases were reviewed and information extracted including indication for further action, whether action occurred without coordinator intervention and outcome.

**Results** All coded films over a 6-month period (n=331) were analysed. The most frequent indications for further action included the assessment of pneumonia resolution (n=167), further review of possible hilar pathology (n=25), small nodules (n=22) and other unexplained abnormalities. 143 cases (42.6%) required action by the coordinator. In total, 4% (n=13) of cases yielded significant diagnoses including eight malignancies, pulmonary embolism, cobalt induced fibrosis and asbestosis, of these one case required action by the coordinator.

**Conclusions** This study suggests that a large proportion of abnormal chest radiographs are not followed-up as suggested by the reporting radiologist. Significant diagnoses may therefore be delayed unnecessarily. There is little reason to assume that similar practice is uncommon throughout the country. While the number of significant diagnoses detected by the "safety-net" system was perhaps lower than expected, some may consider a delay in 7.7% (1/13) unacceptably high. Further exploration of this area is needed to decide whether this is an effective use of resources.

**P232 SHORT-TERM OUTCOMES IN HEART FAILURE PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN THE COMMUNITY**

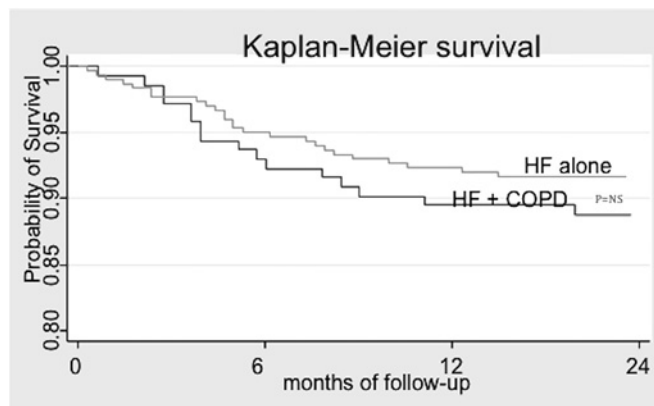
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**Aims** Heart failure (HF) and chronic obstructive pulmonary disease (COPD) are common co-morbidities. The combination presents diagnostic challenges and has been linked with worse prognosis in patients admitted to hospital. There is hardly any prognostic data in patients with both co-morbidities in the community.

**Methods and Results** We evaluated 783 patients (27.2%) with left ventricular systolic dysfunction under the care of a regional nurse-led community HF team between June 2007 and June 2010. 101 patients (12.9%) also had a diagnosis of COPD. 94% of patients were on loop diuretics; 83% on ACE inhibitors, 74% on  $\beta$ -blockers; 10.6% were on

bronchodilators and 42% on aldosterone antagonists. Mean age of the patients was  $77.9 \pm 5.7$  years; 43% were females and mean NYHA class was  $2.3 \pm 0.6$ . Mean follow-up was  $28.2 \pm 2.9$  months.  $\beta$ -Blocker utilisation was markedly lower in patients receiving bronchodilators compared to those without (overall 21.7% vs 81%;  $p < 0.001$ ). 24-month survival (Abstract P232 figure 1) was 93% in patients with HF alone and 89% in those with both co-morbidities ( $p = \text{NS}$ ). The presence of COPD was associated with increased HF hospitalisations [HR 1.56 (1.4 to 2.1);  $p < 0.001$ ] and major adverse cardiovascular events [HR 1.23 (1.03 to 1.75);  $p < 0.001$ ].



Abstract P232 Figure 1 Kaplan-Meier survival curve in patients with heart failure, comparing those with and without chronic obstructive pulmonary disease for June 2007 to June 2010.

**Conclusions** COPD is a common co-morbidity in ambulatory HF patients in the community and is a powerful predictor of worsening HF. It does not however appear to affect short-term mortality in ambulatory HF patients.

**P233 JUDICIOUS USE OF OXIMETRY CAN HELP DELIVER COST EFFECTIVE SLEEP SERVICE**

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**Background** Referrals to sleep service are increasing rapidly and make up to 30% of referrals to the Queen's Medical Centre campus of Nottingham Respiratory Department. Limited channel polysomnography (PSG) at home (PSH-H) or video (PSG\_V) are time consuming and costly. In a retrospective study we assessed the role of oximetry in delivering cost effective sleep service.

**Methods** We reviewed new referrals to sleep clinic during February and March 2011. We aimed to quantify referrals, assess what investigations were done, the results of these and subsequent management. Cost analysis was then performed to assess impact of the tests ordered on service delivery. Costs of various tests at our centre are: oximetry £28, PSG-H—£ 200 and PSG-V—£350.

**Results** In February and March this year 79 new referrals were identified for snoring or sleep disturbance. 53 patients (67%) had oximetry as first test and 26 (33%) had PSG-H or PSG limited or video PSG. The two groups had similar baseline characteristics with BMI of and Epworth Sleepiness Scale (ESS) score of 11. Of those who initially had oximetry 15 (29%) went on to have PSG. Thus 52% of all referrals had PSG whereas 48% were managed with oximetry only. There was statistically significant correlation between 4% oxygen desaturation index per hour (4% ODI) and apnoea-hypopnoea index (AHI) obtained from PSG ( $R = 0.96$ ;  $p = 0.05$ ). The type of diagnostic test used had no impact on CPAP use. We see 600 new referrals per year. Had all patients been subjected to PSG it would cost the service