over days for VE-FV, VE-SP or VE-CM (p = 0.350; p = 0.724; p = 0.972). There was a larger unexplained within-subjects variation for VE-FV (CV 10.4%) compared with VE-SP (CV 6.2%) or VE-CM (CV 6.4%). Other measures recorded (eg, HR, VT, RR, etc) showed mostly similar results.

**Conclusion:** The LifeShirt provided valid and reliable data across multiple assessments; however, it tended to underestimate VE. Calibration by spirometer improves the accuracy of VE compared with fixed-volume bag calibration. When calibrated appropriately, the LifeShirt is likely to be a useful outcome measure in clinical trials.

**Funding:** This study was supported through a Cast Award with Vivometrics Inc. Statistical analysis was performed independently by A Nevill.

**P132 INITIAL EXPERIENCE USING AN ELECTRONIC NOSE FOR ANALYSIS OF EXHALED BREATH**

1. G. Warwick, 1. E. O’Lone, 1. O. Yates, 2. P. S. Thomas. 1. St Vincent's Hospital, Sydney, Australia. 2. Inflammatory Diseases Research Unit, University of New South Wales, Sydney, Australia

**Introduction and Objectives:** There is increasing interest in the use of breath analysis as a means of diagnosing and monitoring lung disease, in particular, exhaled nitric oxide and exhaled breath condensate. Electronic noses (e-noses) have been trialled to analyse patients’ breath in lung cancer and asthma. Using a nano-composite array of organic polymer sensors, the e-nose can detect volatile organic compounds and, using on-board pattern-recognition algorithms, identify patterns that may be discriminatory. We investigated the feasibility of using an e-nose (Cyranose C320, Smiths Detection, Pasadena, California, USA) to distinguish the breath of smokers from non-smokers.

**Methods:** Smoking and non-smoking subjects exhaled from total lung capacity into a 2 litre Mylar bag. Samples were introduced to the e-nose in random order. Exhaled breath was drawn into the e-nose and examined by online principal component analysis (PCA) and canonical discriminant analysis; data were digitally filtered using a Savitzky–Golay filter to improve signal-to-noise ratio. Samples identified as outliers by virtue of high Euclidean distance were censored. Cross-validation was then performed.

**Results:** PCA of 16 subjects was able to show excellent discrimination of smokers from non-smokers. Cross-validation showed mostly similar results.

**Conclusion:** The LifeShirt provided valid and reliable data across multiple assessments; however, it tended to underestimate VE. Calibration by spirometer improves the accuracy of VE compared with fixed-volume bag calibration. When calibrated appropriately, the LifeShirt is likely to be a useful outcome measure in clinical trials.

**Funding:** This study was supported through a Cast Award with Vivometrics Inc. Statistical analysis was performed independently by A Nevill.

**P133 NON-INVASIVE ASSESSMENT OF CARDIAC OUTPUT USING AN INERT GAS REBREATTHING DEVICE: REPEATABILITY AND REPRODUCIBILITY IN NORMAL CONTROLS**


**Background:** A reliable non-invasive measure of cardiac output (CO) is desirable for the management of patients with cardiopulmonary disease. CO may be indirectly assessed by the measurement of pulmonary blood flow by inert gas rebreathing techniques. Respiratory mass spectrometers (with acetylene) have been used for this purpose, but in practice are difficult, bulky and costly machines to maintain. The newer Innocor™ device (Innovision, Denmark) uses photoacoustic spectroscopy for rapid analysis and is portable and convenient to use.

**Aim:** We study the intra-session repeatability and inter-session reproducibility of the Innocor™ device for the measurement of CO in normal volunteers.

**Methods:** Twenty-three normal volunteers (eight men, mean age 34 ± 8 years) had lung volume measurements by constant-volume body plethysmograph. On the same day, subjects underwent three consecutive CO measurements with the Innocor™ device. Twenty subjects returned for repeat assessment (1–13 weeks later). The intra-session repeatability and inter-session reproducibility of this CO measurement was assessed and the coefficient of variation reported.

**Results:** Baseline parameters as assessed by the Innocor device included: CO 5.24 ± 1.21 l/minute, cardiac index 2.91 ± 0.49 l/minute/m², heart rate 75 ± 12 bpm and oxygen saturation 98.3 ± 0.5%. Mean total lung capacity was 101.5 ± 14.0% and vital capacity was 102.2 ± 14.9%. Two subjects were ex-smokers and one had mild asthma. CO measurements showed good intra-session repeatability with a coefficient of variation of 6.57%. Inter-session reproducibility was high with a mean CO difference of 0.13 and a single determinant standard deviation of 0.49. The inter-session coefficient of variation was 9.7%.

**Conclusion:** Non-invasive CO as measured by the inert gas rebreathing Innocor™ device has good intra-session repeatability and inter-session reproducibility. It may be a useful clinical marker for the assessment and follow-up of patients with cardiorespiratory disease.

**P134 SPECIALIST CHRONIC DISEASE MANAGEMENT FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE REDUCES ADMISSIONS IN A SEMI-RURAL SETTING**


**Background:** Homecare for chronic obstructive pulmonary disease (COPD) has had mixed results depending on the setting and model applied.

**Aim:** To see if a specialist team, working in the community under clinical supervision by secondary care respiratory consultants, impact on COPD admissions.

**Setting:** Two UK district general hospitals serving a semi-rural population of 190 000.

**Personnel:** Two nurses and a respiratory physiotherapist, employed by the local health board (PCT) and coordinated by a manager whose background is specialist respiratory nursing. Each covers a geographical area of our county.

**Criteria:** They accept referrals from primary and secondary care if a COPD diagnosis is confirmed by spirometry, patients are on optimal therapy as per NICE guidelines but have any of: continued symptoms; recent admission from COPD; multiple exacerbations in the previous 12 months.

**Process:** Referrals are prioritised and seen by the team within 1 to 28 days, but not out-of-hours. The team has weekly meetings with rotating respiratory consultants, supported by direct access to the multidisciplinary hospital respiratory team for clinical advice, medicines prescription and radiology. They provide home visits (a clinical assessment and basic observations) and can bring prescribed medication to homes to treat exacerbations promptly; they provide telephone contact, education on COPD for patients/carers/relatives.

**Abstract P134 Table**

<table>
<thead>
<tr>
<th></th>
<th>Pre-CDM</th>
<th>Post-CDM</th>
<th>Z score</th>
<th>p Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Months</td>
<td>0.60 (0–6)</td>
<td>0.22 (0–4)</td>
<td>−5.58</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>6 Months</td>
<td>0.86 (0–10)</td>
<td>0.44 (0–5)</td>
<td>−5.23</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>12 Months</td>
<td>1.14 (0–13)</td>
<td>0.79 (0–9)</td>
<td>−2.82</td>
<td>&lt; 0.005</td>
</tr>
</tbody>
</table>

*Wilcoxon rank. CDM, chronic disease management.
reiterating advice on self-management, exercise and pulmonary rehabilitation and liaise with GPs and other community health professionals. LTOT, domiciliary NIV and pulmonary rehabilitation are available locally.

**Analysis:** Retrospective review of admission data and clinical records.

**Results:** Over the first year they received 204 referrals; 15 were rejected. There were no reported adverse clinical events and a 52% reduction in COPD admissions to hospital. The table illustrates the mean number (range) of admissions per (still living) patient over time.

**Conclusions:** A sustained reduction in COPD admissions can be achieved in this setting, using a specialist respiratory team applying strict referral criteria, with close secondary care support.

**Abstract P135 Table**

<table>
<thead>
<tr>
<th>Year</th>
<th>GOLD stage mild (%)</th>
<th>GOLD stage moderate (%)</th>
<th>GOLD stage severe (%)</th>
<th>Total no of admissions with COPD exacerbation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>7</td>
<td>33</td>
<td>60</td>
<td>248</td>
</tr>
<tr>
<td>2005</td>
<td>6</td>
<td>33</td>
<td>61</td>
<td>168</td>
</tr>
<tr>
<td>2006</td>
<td>10</td>
<td>30</td>
<td>60</td>
<td>177</td>
</tr>
<tr>
<td>2007</td>
<td>4</td>
<td>24</td>
<td>72</td>
<td>116</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>22</td>
<td>74</td>
<td>96</td>
</tr>
</tbody>
</table>

COPD, chronic obstructive pulmonary disease.

**Conclusion:** Emergency admissions to our hospital with exacerbations of COPD are reducing. The ratio of severe to moderate disease appears to be increasing over time. It is unclear whether this is due to the impact of our nurse-led early discharge scheme or the totality of other locally implemented changes.

1. **Global initiative for chronic obstructive lung disease.** Global strategy for the diagnosis, management and prevention of COPD. AJRCCM 2001;163.

2. **Hospital episode statistics.** www.hesonline.nhs.uk.
Rapid readmission to hospital following an exacerbation of chronic obstructive pulmonary disease (COPD) is common, approximately 30% at 3 months. Physiological measures of disease severity did not predict readmission in earlier studies. We set out to study if measures of nutrition would better predict rapid readmission, as a previous study has shown that admissions are related to body mass index (BMI). Fifty-two patients admitted with an exacerbation of COPD were prospectively studied at the point of discharge. Nutritional and physiological data were collected and any subsequent readmission documented. Nineteen patients were readmitted within 3 months and these were compared with the 33 patients who were not readmitted. Readmitted patients were significantly older 73 (6.4) versus 66 (9), p = 0.043, but there were no significant differences in physiological measures.

Nutritional measures used were albumin, BMI and mid-arm circumference (MAC). Mean albumin levels were not significantly different from each other 37 (5.5) versus 39 (5), respectively. In conclusion the lack of a difference in the mean albumin may be due to the fact that albumin acts as a reverse acute phase protein as well as a marker of nutritional status. The differences in BMI and MAC between the groups suggests that nutritional status is important not just in the admission of patients with COPD as shown before but also in those who are rapidly readmitted following discharge (see table).


Abstract P137 Table

<table>
<thead>
<tr>
<th>Proportion male</th>
<th>Not rapid</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Predicted FEV₁</td>
<td>15/19</td>
<td>19/33</td>
</tr>
<tr>
<td>Reported exercise tolerance</td>
<td>34 (11)</td>
<td>36 (14)</td>
</tr>
<tr>
<td>PaCO₂ (kPa)</td>
<td>381 (1000)</td>
<td>303 (520)</td>
</tr>
<tr>
<td>PaO₂ (kPa)</td>
<td>7.2 (4.8)</td>
<td>6 (1.2)</td>
</tr>
</tbody>
</table>

Abstract P138 Table

<table>
<thead>
<tr>
<th>Subject</th>
<th>H influenzae</th>
<th>M catarrhalis</th>
<th>S pneumoniae</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>25</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Age (SD) (years)</td>
<td>71.0 (6.8)</td>
<td>72.4 (6.7)</td>
<td>70.9 (8.3)</td>
</tr>
<tr>
<td>Male (%)</td>
<td>88</td>
<td>44*</td>
<td>40*</td>
</tr>
<tr>
<td>FEV₁ % predicted (%) (SD)</td>
<td>40.2 (14.7)</td>
<td>37.6 (12.4)</td>
<td>46.3 (10.8)</td>
</tr>
<tr>
<td>Exacerbation during study (%)</td>
<td>76</td>
<td>78</td>
<td>80</td>
</tr>
<tr>
<td>Median time to next exacerbation or study end (days) (IQR)</td>
<td>98 (47–284)</td>
<td>73 (40–116)</td>
<td>83 (56–89)</td>
</tr>
</tbody>
</table>

*Significant difference when compared with H influenzae. IQR, interquartile range.
**Companion Abstract: Observations and Results**

**P139** COMPARISON OF PATIENT RECALLED EXACERBATION FREQUENCY AND EXACERBATION FREQUENCY IN THE NEXT YEAR


**Background:** Exacerbations of chronic obstructive pulmonary disease (COPD) are important therapeutic outcomes and knowledge of exacerbation frequency is important for stratification onto clinical trials. We investigated whether a patient’s recall of their exacerbations in the previous year was related to the number of exacerbations they would have in the following year.

**Methods:** Patients were asked to recall their exacerbations in the preceding year at the time of recruitment to the London cohort. After one year of participation in the cohort, daily diary cards were collected and we counted the number of exacerbations each patient had over that year. Our definition of an exacerbation using the diary cards was the presence of two major symptoms or one major and one minor for more than 2 days (major symptoms: increased dyspnoea, sputum volume or sputum purulence; minor: cold, wheeze, cough, sore throat, or fever) or if in the opinion of the clinician the patient had an exacerbation. Frequent exacerbators were defined as patients having three or more exacerbations per year, and infrequent exacerbators less than three. We studied 58 patients; mean age 71.8 years (SD 8.1), FEV1 1.1 litres (0.5), FEV1 % predicted 46.6% (17.3) smoking history 49.6 pack years (40.2).

**Results:** There was no significant difference between the number of exacerbations patients recalled prior to recruitment and the actual number they recorded on diary cards in their first year of the study; mean 1.8 (1.8) and 2.1 (2.0) and median 1.0 (interquartile range 0–2.25) and 2.0 (0–3.25), respectively. Wilcoxon p = 0.24. 12 out of 19 frequent exacerbators correctly perceived themselves to be frequent exacerbators (sensitivity 85.7%) and 37 out of 39 infrequent exacerbators correctly classified themselves as infrequent (specificity 84.1%).

**Conclusions:** We have shown that patient recall of their exacerbation frequency can be used to stratify patients as frequent or infrequent exacerbators in subsequent years. This may have implications for recruitment into clinical trials.

**Funding:** This abstract was funded by NIH RO1 HL082578.

**P140** PREDICTORS OF READMISSION AND MORTALITY FOLLOWING ADMISSION FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE EXACERBATION

PS Albert, S Jones, L Davies, PMA Calverley. University Hospital Aintree, Liverpool, UK

It is recognised that hospitalisation due to a chronic obstructive pulmonary disease (COPD) exacerbation is associated with increased mortality and readmission rates post-discharge (Groenewegen et al. *Chest* 2003). Celli et al have used the BODE index (N Engl J Med 2004) to predict the risk of death in stable COPD. We wished to determine whether the BODE index and its components predicted mortality or readmission at 12 months in a COPD patient cohort. Frequent exacerbators were defined as patients having three or more exacerbations per year, and infrequent exacerbators less than three. We studied 58 patients; mean age 71.8 years (SD 8.1), FEV1 1.1 litres (0.5), FEV1 % predicted 46.6% (17.3) smoking history 49.6 pack years (40.2).

**Results:** There was no significant difference between the number of exacerbations patients recalled prior to recruitment and the actual number they recorded on diary cards in their first year of the study; mean 1.8 (1.8) and 2.1 (2.0) and median 1.0 (interquartile range 0–2.25) and 2.0 (0–3.25), respectively. Wilcoxon p = 0.24. 12 out of 19 frequent exacerbators correctly perceived themselves to be frequent exacerbators (sensitivity 85.7%) and 37 out of 39 infrequent exacerbators correctly classified themselves as infrequent (specificity 84.1%).

**Conclusions:** We have shown that patient recall of their exacerbation frequency can be used to stratify patients as frequent or infrequent exacerbators in subsequent years. This may have implications for recruitment into clinical trials.

**Funding:** This abstract was funded by NIH RO1 HL082578.

**P141** PSYCHOLOGICAL FACTORS AND RAPID READMISSION FOLLOWING AN EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

D Pandit, MJ Doherty. Department of Respiratory Medicine, Dudley Group of Hospitals, Dudley, West Midlands, UK

In patients admitted to hospital with an acute exacerbation of chronic obstructive pulmonary disease (COPD), rapid readmission is common and problematic. Previous studies have shown that psychological factors do not predict readmission, but a measure of quality of life (St George’s respiratory questionnaire) does. We therefore set out to examine if a number of validated psychological measures are better associated with readmission. Fifty-two patients admitted with an exacerbation of COPD were prospectively studied at the point of discharge following an exacerbation of COPD. Physiological and psychological data were collected and readmission in the next 3 months studied by use of hospital records and contact with the GP. Data were analysed using Mann–Whitney and χ² for categorical data. Nineteen patients were readmitted within 3 months and 33 were not. Readmitted patients were significantly older (73 (6.4) versus 66 (9) years, p = 0.04, but there was no difference in the physiological measures between the two groups (see table).

**Psychological measures including hospital anxiety and depression score 16 (7) versus 15 (7.4), social support scale 2.7 (0.6) versus 2.8 (0.6), London chest activity of daily living score 38 (16) versus 35.7 (12.3), illness perception questionnaire (symptoms, timing, severity and control subsets), family APGAR 8.7 (2.5) versus 7.7 (3.3) were similar in both groups of patients, p > 0.2 in all cases. The only psychological factor that came close to significance was optimism (life orientation test) 14.6 (4.6) versus 12 (5.3), p = 0.08, higher scores denoting pessimism. This study suggests that neither the physiological nor the psychological measures we used predict readmission; it may be that measures of self-management and knowledge might have been worth including in the study.

Introduction and Objectives: Chronic obstructive pulmonary disease (COPD) is the fifth leading cause of death worldwide. With disease progression, exacerbations increase in frequency with associated recovery longevity. COPD exacerbation is diagnosed on the basis of history, examination and chest x-ray (CXR). This is a prospective observational study of patients attending MAU with an acute exacerbation of COPD in one trust over a 6-month period. The aims are to determine if correlation in CXR interpretation by clinicians compared with radiologists occurs and to assess any impact on clinical decision and management with regard to the initiation of empirical antibiotics.

Methods: Data were collected on all patients presenting to MAU with an acute exacerbation of COPD over a 6-month period. We compared CXR findings of clinicians from medical case notes with those of radiologists on PACS. We identified the proportion of patients started on empirical antibiotics and compared this with those correctly identified as having evidence of true infective exacerbations by the presence of radiological pneumonia to determine any discrepancies.

Results: Mean age for the 45 successive patients identified with an acute exacerbation of COPD was 71.8 years (range 46–91). Discrepancies were noted in 17.8% of patients who were treated with antibiotics for a presumed pneumonia-related exacerbation by clinicians in which radiologists reported no radiological evidence of infection. However, 13.3% of these were perceived to have a true infective exacerbation based on clinical and laboratory findings in these patients. It is important to have a consensus in CXR interpretation by clinicians compared with radiologists on PACS. We identified the proportion of patients who were treated with antibiotics for a presumed pneumonia-related exacerbation by clinicians in which radiologists reported no radiological evidence of infection. Furthermore, 4.5% of patients with definite radiological evidence of infection were not given antibiotics based on clinicians’ CXR interpretation. Radiological evidence did not make any difference in antibiotic prescribing. Adverse effects were noted in 4.5% of patients with half developing Clostridium difficile.

Conclusions and Recommendations: Considerable variability between clinician and radiologist reporting of CXR interpretation in these patients was noted. It is important to have a consensus with regard to clinical decision-making and the management of these patients. Recommendations include a facility for rapid radiological opinion to reduce the threshold for inappropriate antibiotic use.

**Abstract P143 Table Clinical and physiological measurements in end-stage COPD**

<table>
<thead>
<tr>
<th>Parameters on admission</th>
<th>Final admission</th>
<th>Penultimate admission</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWS (oa) median (range)</td>
<td>3 (1–8)</td>
<td>2 (0–3)</td>
<td>p&lt;0.005</td>
</tr>
<tr>
<td>EWS (oa) &gt;3</td>
<td>78%</td>
<td>27.5%</td>
<td>OR 9.1 (3–25) p&lt;0.001</td>
</tr>
<tr>
<td>EWS (24) median (range)</td>
<td>3 (2–8)</td>
<td>2 (1–6)</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>EWS (24) &gt;3</td>
<td>68.8%</td>
<td>30%</td>
<td>OR 5.1 (1.45–16) p&lt;0.005</td>
</tr>
<tr>
<td>WHO-PS median (range)</td>
<td>3 (2–4)</td>
<td>2 (0–3)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>WHO-PS &gt;3</td>
<td>87.3%</td>
<td>47.3%</td>
<td>OR 7.5 (2.7–20.4) p&lt;0.005</td>
</tr>
<tr>
<td>Arterial blood pH &lt;7.35</td>
<td>49.0%</td>
<td>15%</td>
<td>OR 5 (2–14) p&lt;0.001</td>
</tr>
<tr>
<td>Urea &gt;7.0 mmol/l</td>
<td>71%</td>
<td>52%</td>
<td>OR 2.2 (0.9–5.1) p&lt;0.05</td>
</tr>
</tbody>
</table>

COPD, chronic obstructive pulmonary disease; EWS, early warning score (composite score of bedside physiological measurements); oa, on admission; OR, odds ratio; 24, at 24 h; WHO-PS, WHO performance score.

**P144 THE ROLE OF PATIENT-SPECIFIC PROTOCOLS TO REGULATE OXYGEN DELIVERY DURING ACUTE AMBULANCE TRANSPORT IN PATIENTS WITH CHRONIC TYPE II RESPIRATORY FAILURE AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE: EFFICACY OF USE AND EFFECT ON LENGTH OF STAY**

M Stern, H Broomfield, T Kühik, M Whitbread, L Restrick. 1Department of Respiratory Medicine, Whittington Hospital, London, UK; 2London Ambulance Service (LAS), London, UK

Introduction: Oxygen delivered (FiO2) in inappropriately high concentrations can worsen hypercapnia, causing acidosis in patients with chronic type 2 respiratory failure (T2RF) due to chronic obstructive pulmonary disease (COPD)/other causes. We introduced...
patient-specific protocols (PSP) to instruct ambulance staff about specific \( O_2 \) requirements for known chronic T2RF patients during acute ambulance transfer to hospital and studied their use and effect on length of stay (LOS).

**Method:** Patients with chronic T2RF, or acute T2RF when unwell, were given a PSP documenting \( \text{FiO}_2 \) recommended to maintain \( \text{SaO}_2 \) 88–92%, with instructions if these parameters could not be achieved. PSP were agreed and co-signed by two respiratory consultants and the LAS medical director. Copies were held in notes, by patients and “flagged” by LAS to alert ambulance staff on calls-outs. Ambulance \( \text{FiO}_2 \) and oximetry, initial arterial blood gases, admissions and LOS were reviewed retrospectively for 12 months before and after PSP issue.

**Results:** 20 patients (six men; 14 women; 19 COPD, one nocturnal hypoventilation; 13 (65%) on LTOT; mean \( \pm \) SE age 71.9 \( \pm \) 2.1 years, \( \text{FEV}_1 \) 0.66 \( \pm \) 0.06l, MRC dyspnoea score 4.6 \( \pm \) 0.1) received PSP (April–September 2006). They had 60 admissions (3.2 \( \pm \) 0.4/patient, mean \( \pm \) SE) in the year before PSP and 67 admissions (3.4 \( \pm \) 0.4/patient) in the year after. Before PSP, ambulance \( \text{FiO}_2 \) was \( \geq \)28% in 26% of transfers (10/39), but after PSP, occurred in 13% transfers (8/61, \( p = 0.06 \)). Inappropriately high ambulance \( \text{FiO}_2 \) resulting in \( \text{SaO}_2 \) \( \geq \)92% occurred in 64% of transfers (16/25 transfers; data not recorded in 14) before PSP, but occurred significantly (\( p < 0.001 \)) less frequently after PSP (12/55 transfers (22.8%); data not recorded in four). There was no significant decrease in episodes of acute-on-chronic T2RF (5/41 (12%) before; 7/51 (14%) after PSP) or total LOS (mean \( \pm \) SE 35.2 \( \pm \) 7.1 days before; 35.5 \( \pm \) 5.2 days after). Bicarbonate increased from mean \( \pm \) SE 1.0 mmol/l in the year before to 34.1 \( \pm \) 1.0 mmol/l in the year after. 11/20 (55%) of the patients died during the year following the study, none related to acute hypoxia.

**Conclusion:** Patients with chronic T2RF are at high risk of acute T2RF and death. Whereas PSP were effective in reducing inappropriately high \( \text{FiO}_2 \) during ambulance transfer in susceptible patients with chronic T2RF, they had no effect on LOS, episodes of acute T2RF or serum bicarbonate, all of which reflect disease severity.

Clinical investigation of interstitial lung disease

**P145** NOCTURNAL OXYGEN DESATURATION IS COMMON IN INTERSTITIAL LUNG DISEASE AND OCCURS IN PATIENTS WITHOUT RESTING OR EXERCISE-INDUCED HYPOXIA

TJ Corte, SJ Wort, S Talbot, AU Wells. Royal Brompton Hospital, London, UK

In patients with interstitial lung disease (ILD), nocturnal oxygen desaturation is associated with poorer quality of life and may contribute to long-term vascular stress. Nocturnal desaturation is thought to be common in ILD patients, with previous studies reporting its prevalence at 50–88%.

**Aim:** To determine the prevalence of nocturnal desaturation in ILD patients and in the subgroup of patients without resting or exercise-induced hypoxia.

**Methods:** We reviewed 102 ILD patients (mean age 57.5 \( \pm \) 12.7 years; 54 male) with overnight oximetry, pulmonary function and echocardiography during 2005–8. In order to study disproportionate PAH, we excluded patients with severe disease (TLco \( < \)60%), in which PAH is not unexpected. We considered significant nocturnal desaturation as having \( \text{SpO}_2 \) \( < \)90% for \( \geq \)10% of sleep. Evidence of PAH on echocardiography was considered as systolic pulmonary arterial pressure (assPAP) \( \geq \)40 mm Hg and/or right ventricular dilatation or functional impairment. The association between nocturnal desaturation and markers of pulmonary vascular impairment was assessed.

**Results:** Baseline parameters: On overnight oximetry, 41 (40%) had significant nocturnal desaturation. Mean minimum \( \text{SpO}_2 \) was 85.2 \( \pm \) 7.3%, and fall in \( \text{SpO}_2 \) was 10.1 \( \pm \) 6.9%. Patients spent 17.6 \( \pm \) 26.3% of the night \( < \)90%. Patients had a mean body mass index of 29.0 \( \pm \) 6.1 kg/m²; 6-minute walk test (6MWT) end \( \text{SpO}_2 \) 90.7 \( \pm \) 5.6%; 6MWT distance 345.9 \( \pm \) 111.4 m TLco% 46.9 \( \pm \) 13.8%; FVC% 73.8 \( \pm \) 23.3%; composite physiological index (CPI) 44.9 \( \pm \) 13.9 and \( \text{SpO}_2 \) 94.9 \( \pm \) 2.6%. Analysis: Patients with significant nocturnal desaturation was considered as spending \( \geq \)10% of sleep with \( \text{SpO}_2 \) \( < \)90%. We determine the prevalence of nocturnal desaturation and its frequency in those without resting or exercise hypoxia.

**Results:** On overnight oximetry, 128 (75%) patients had oxygen desaturation to \( < \)90% at any stage of the night. However, 73 (42%) had significant nocturnal desaturation (\( \geq \)10% of sleep with \( \text{SpO}_2 \) \( < \)90%). Mean minimum \( \text{SpO}_2 \) was 84.0 \( \pm \) 8.6% and fall in \( \text{SpO}_2 \) was 11.4 \( \pm \) 5.4%. Patients spent an average of 18.1 \( \pm \) 26.9% of the night below 90%. In 6MWT, mean end \( \text{SpO}_2 \) was 87.9 \( \pm \) 7.5% and 6MWT distance was 325.4 \( \pm \) 124.8 m. Sixty-two (50%) had oxygen desaturation to \( < \)88% during 6MWT. Patients had a mean body mass index of 28.4 \( \pm \) 6.7 kg/m²; TLco% 37.3 \( \pm \) 16.6%; FVC% 66.3 \( \pm \) 23.4% and \( \text{SpO}_2 \) 95.4 \( \pm \) 2.5%. As demonstrated in the table, nocturnal desaturation was present in 49 of 149 (33%) patients without resting hypoxia and in 57 of 65 (59%) patients without desaturation on 6MWT.

**Conclusion:** Nocturnal desaturation is frequent in ILD patients and is not uncommon in patients without resting or exercise-induced hypoxia. These results suggest that overnight oximetry is necessary to exclude significant nocturnal desaturation in ILD patients.

**Abstract P145 Table Prevalence of significant nocturnal desaturation (\( \text{SpO}_2 < 90\% \) for \( \geq 10\% \) sleep) in patients with and without resting and exercise-induced hypoxia**

<table>
<thead>
<tr>
<th></th>
<th>Daytime ( \text{SpO}_2 &lt; 93% ) (n = 27)</th>
<th>6MWT end ( \text{SpO}_2 ) ( &gt; 88% ) (n = 63)</th>
<th>6MWT end ( \text{SpO}_2 &lt; 88% ) (n = 62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No significant desaturation (n = 103)</td>
<td>100</td>
<td>3</td>
<td>37</td>
</tr>
<tr>
<td>Significant desaturation (n = 73)</td>
<td>49</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>

6MWT, 6-minute walk test.
Chronic obstructive pulmonary disease: exacerbations and hospital admissions

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