

**P78 PHYSICAL INACTIVITY IS ASSOCIATED WITH MID-THIGH INTRAMUSCULAR FAT IN PATIENTS WITH COPD**

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**Introduction** Quadriceps muscle impairment is an important complication of COPD occurring in mild as well as more advanced disease<sup>1</sup>. This is driven by physical inactivity and can include muscle atrophy and/or a shift towards a less aerobic phenotype with reduced Type I fibre proportions and a reduction in capillarity and oxidative enzymes.<sup>2</sup> We hypothesised that physical inactivity in COPD patients would be associated with intramuscular fat and that this could potentially be a non-invasive and non-volitional marker of muscle quality.

**Methods** Mid-thigh cross-sectional area (MT<sub>CSA</sub>), percentage intramuscular fat and skeletal muscle attenuation (Hounsfield units [HU]) were assessed using computed tomography (CT) image analysis. Tissues were differentiated using standard attenuation ranges; fat: -190 to -30HU and skeletal muscle: -29 to 150HU Quadriceps isometric maximal voluntary contraction (QMVC) was measured using a strain gauge. Fat-free mass index (FFMI) and the impedance ratio ( $Z_{200}/Z_5$ ) were determined by bioelectrical impedance analysis. Daily step count and physical activity level (PAL) were recorded over 6 days using a multisensory biaxial armband accelerometer (SenseWear, Bodymedia; Pittsburgh, US).

**Results** 69 patients (mean (SD), 65(8) years, FEV<sub>1</sub> 44(21)% predicted, 54% male) participated in the study. Mean (SD) daily step count was 4502 (3274) steps; physical activity level 1.4 (0.2); QMVC 25.2 (5.9) kg; FFMI 17.3 (2.3)kg/m<sup>2</sup>, MT<sub>CSA</sub> 178 (43)cm<sup>2</sup>. Using a stepwise regression model incorporating MT<sub>CSA</sub>, intramuscular fat, skeletal muscle attenuation, QMVC, and FFMI as independent variables, only skeletal muscle attenuation (HU) was retained as an independent correlate of daily step count ( $r=0.34$ ,  $p=0.006$ ). In a similar model, percentage intramuscular fat was the only independent predictor of physical activity level ( $r=0.37$ ,  $p=0.002$ ). The bioelectrical impedance ratio ( $Z_{200}/Z_5$ ) was also associated with skeletal muscle attenuation ( $r=0.40$ ,  $p<0.001$ ) in this cohort.

**Conclusion** These data suggest that muscle "quality" assessed using CT is independently associated with daily physical activity and may therefore have potential as a biomarker in this area.

1. Shrikrishna D *et al.* Quadriceps wasting and physical inactivity in patients with COPD. *Eur Resp J* 2012; doi: 10.1183/09031936.00170111.
2. Shrikrishna D, Hopkinson NS. Chronic obstructive pulmonary disease: consequences beyond the lung. *Clin Med* 2012; 12:71-4.

**P79 QUANTIFYING PHYSICAL ACTIVITY FOR 30 DAYS VIA PEDOMETRY IN COPD PATIENTS**

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**Introduction** Physical activity and exercise capacity are among the important patient-relevant parameters in COPD. COPD patients are less active and less likely to go outside when compared with the general population and this worsens during exacerbation (1). The aim of this study was to determine whether step-counts measured by a pedometer (Yamax Digi-walker SW-200) would be a useful method of quantifying physical activity in stable COPD patients on the community.

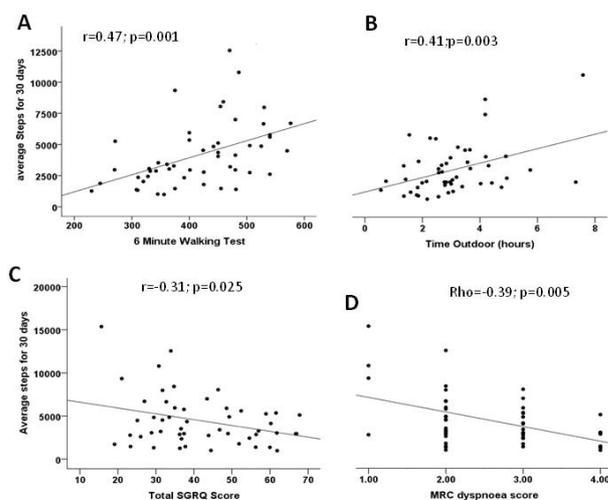
**Methods** Stable COPD outpatients wore a pedometer for 30 days, had a six minute walk distance (6MWD) assessed according to ATS protocols and completed the SGRQ (St. George's Respiratory Questionnaire) and MRC dyspnoea score. The pedometer was worn on the left-hand side during waking hours. Patients recorded daily step counts and time spent outdoors on written daily diary cards.

**Results** Fifty-five COPD patients had a mean ( $\pm$ SD) age 70.3 (8.7) years and FEV<sub>1</sub> 51.0% predicted ( $\pm$ 14.1); male gender 67%. The mean ( $\pm$ SD) 6MWD was 416 ( $\pm$ 88) metres, with an average of 4327 ( $\pm$ 2944) steps/day and spent 3.1 ( $\pm$ 1.4) hours outdoors. Figure 1 shows that patients with greater 6MWD took more steps per day during normal activity [ $r=0.47$ ;  $p=0.001$ ], Fig. 1A, and stayed outdoors for longer [ $r=0.41$ ;  $p=0.003$ ], Fig. 1B. Patients with lower step counts tended to have a poorer health status in terms of SGRQ score [ $r=-0.31$ ;  $p=0.025$ ], Fig. 1C, and a higher level of dyspnoea on the MRC score [ $\rho=-0.39$ ;  $p=0.005$ ], Fig. 1D.

**Conclusions** Daily step counts measured by a pedometer averaged over 30 days correlated well with objective tests of physical capacity, time outdoors, health status and dyspnoea. Thus pedometry is a useful method of quantifying daily physical activity in COPD patients.

**References**

1. Donaldson GC *et al.*, Exacerbations and Time Spent Outdoors in Chronic Obstructive Pulmonary Disease, *Am J Resp Crit Care Med* (2005) 171: 446-452.



Abstract P79 Figure 1

**P80 COMING AND GOING: COPD PATIENTS' EXPERIENCES OF HOSPITAL ADMISSION AND DISCHARGE**

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**Background** Chronic Obstructive Pulmonary Disease (COPD) is a major cause of emergency hospitalisation in the UK. Identifying the principal decisions of seeking admission to hospital and subsequent experiential aspects for the admission and discharge process make it possible to benchmark future quality service provision for COPD patients.

**Aim** Part of a larger study about COPD this aspect of the research aimed to identify patients' experiences of being hospitalised with COPD. The focus of this presentation is about patient-reported experiences of making the decision to go to hospital and later, their subsequent discharge from hospital.

**Method** Nineteen patients with recent acute hospital care for a COPD related illness or exacerbation were interviewed face-to-face.

Recent was defined as admission within the last 3 months prior to the interview. The interviews were conducted in patients' homes. The sample comprised 12 males (63%), 7 (37%) females. The mean age for males and females was 70 years. The data was coded and grouped into 5 categories. The findings for the categories: "Going to hospital" and "Discharge from hospital" are presented.

**Findings** COPD patients have much experience in managing an exacerbation of their condition and can recognise significant changes in their health status requiring urgent hospitalisation. The findings for "Going to hospital" include: who patients rely on to make the decision, how the decision is made/or avoided and their emotive experiences of going to hospital. Patient experiences around "Discharge from hospital" include: consultation, confusion, timeliness and (lack of) streamlining in the discharge process. Patient narratives will be presented.

**Conclusion** Decision-making about going to hospital and the subsequent discharge process can be viewed as the beginning and end points in the hospitalisation journey for COPD patients. Patient experiences about these points in the journey give key insights into decision making, quality care and identify benchmarks for future reviews of service provision to COPD patients.

## P81 LUNG TRANSPLANTATION IN ALPHA-1-ANTITRYPSIN DEFICIENCY

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**Background** Lung transplantation is an option for a proportion of patients with end-stage lung disease who deteriorate despite optimal medical therapy. In patients with alpha-1-antitrypsin deficiency (A1ATD), survival benefit has been demonstrated following transplantation. Patient selection is often subjective and the effects of transplantation on Health Related Quality of Life (HRQOL) in A1ATD are unknown. The aims of the current study were to determine objective measures influencing patient selection, survival benefit and health status following lung transplantation in A1ATD patients.

**Methods** Between 1996 and 2011, patients with A1ATD (PiZ) who had undergone lung transplantation were identified from the UK A1ATD registry. Lung function parameters, including rates of decline pre-transplant, were compared to matched subjects who did not undergo transplantation (matched for sex, age, smoking history and FEV<sub>1</sub>). HRQOL, assessed using the St George's Respiratory Questionnaire (SGRQ), was measured pre and post-transplant together with mortality data.

**Results** Patients who underwent transplantation (n=32) had significantly worse HRQOL than patients who did not in all domains of the SGRQ (total score 64.2; SE±2.5 vs. 55.3±2.04, p=0.008). Markers of gas transfer (TLCO and KCO) were both significantly lower in the transplantation group (33.5%±3.0 and 41.0%±3.9 predicted respectively, compared to 50.6%±.69 and 57.58%±3.1 predicted in the non-transplant group p<0.001 & p=0.001). There were no differences in the rate of lung function decline compared to non-transplanted patients.

Sixteen transplant patients died in the follow up period (6 perioperatively). Figure 1 summarises the Kaplan-Meier survival curve following transplantation. There was no relationship to pre-transplant physiology. Once a survival time of 5 years had been reached, mortality was due to causes unrelated to A1ATD or the transplant.

There was a significant improvement in spirometry (23.94±1.0 vs. 92.73±9.2, p=0.002, N=16) and all domains of the SGRQ post lung transplantation, including the total score (64.2±2.5 vs. 15.6±4.9, p=0.002).

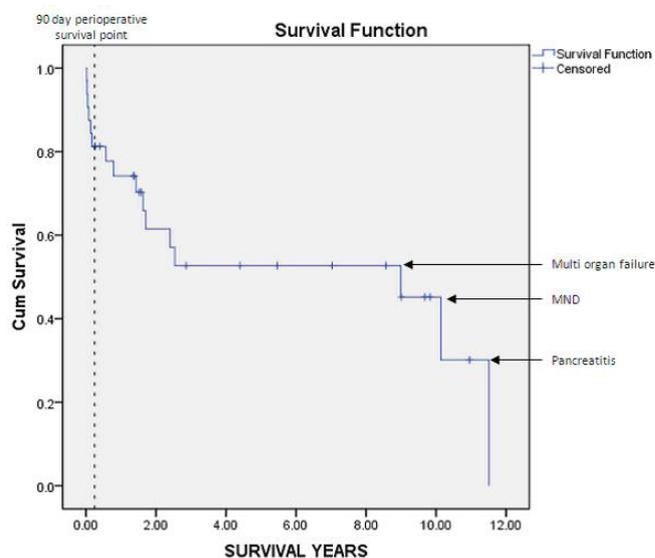


Figure 1 Kaplan-Meier survival curve following transplantation with cause of death post 5 year survival.

## Abstract P81 Figure 1

**Conclusion** Patients who underwent lung transplantation had worse gas transfer parameters pre transplant compared to the otherwise matched A1ATD patients who did not. Lung transplantation in patients with end-stage lung disease secondary to A1ATD significantly improved HRQOL.

## P82 EFFECT OF HOSPITALISATION FOR ACUTE EXACERBATIONS OF COPD ON SUBSEQUENT QUALITY OF LIFE

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**Background** The longitudinal change in quality of life (QoL) following hospitalisation for acute exacerbations of COPD (AECOPD) is uncertain. Current guidelines suggest that non-invasive ventilation (NIV) should not be considered if there is no "potential for recovery to QoL acceptable to the patient", [1] but the expected QoL recovery in this population has not been reported.

**Methods** 183 patients (82 treated with NIV) with AECOPD surviving to hospital discharge were identified prospectively. QoL questionnaires were completed at hospital discharge and at four predefined intervals during the year following discharge, however, for brevity, only the results of the St. George's Respiratory Questionnaire (SGRQ) are reported. Baseline clinical information and subsequent mortality and readmission over 12 months were recorded. Longitudinal QoL was summarised by calculating the mean change in SGRQ (mean change < 0 indicates a QoL improvement during follow-up), with the minimal clinically important SGRQ change taken as ±4.

**Results** Mean (SD) age was 69.0 (9.0) years and most patients: were female (58.5%); had severe airflow obstruction (mean (SD) FEV<sub>1</sub> 40.2 (17.3) % predicted); and were of normal weight (mean (SD) BMI 26.2 (7.0) kgm<sup>-2</sup>). The 12-month readmission and mortality rate were 71% and 18% respectively.

7 patients failed to attend follow-up after discharge and were excluded from analysis. For both patient groups, self-reported respiratory symptoms (SGRQ Symptoms) improved by a clinically important amount during follow-up. For the total population, average overall QoL (SGRQ total) improved during follow-up (mean (SD) change in SGRQ total = -2.47 (13.0)), but not by a clinically important amount. Patients not treated with NIV experienced both