### 87. The latest insights in integrated care

#### P620

# Acute effects of light-emitting diodes on muscle fatigue during isometric exercise in patients with COPD: A pilot study

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**Background:** Patients with chronic obstructive pulmonary disease (COPD) are susceptible to early muscle fatigue. Light-emitting diodes (LEDs) have been used to minimize muscle fatigue in athletes and healthy subjects.

Aim: To investigate the acute effects of LEDs on muscle fatigue and perception of effort in patients with COPD during isometric endurance test of the quadriceps femoris (QF).

**Methods:** Ten patients (VEF1 50±13% of predicted) underwent a single LED and placebo (PL) application, 48 h apart, in a randomized, cross-over design. The LED and PL were applied in three localized areas of the QF (rectus femoris, vastus lateralis, and vastus medialis). Before and after exposure to LED and PL, patients performed an isometric endurance test (80% of the maximum voluntary isometric contraction) until the limit of tolerance concomitant to surface electromyography recording (median frequency as mean outcome). The slope obtained from linear regression analysis of the median frequency (MF) over endurance time was also used as an endurance index.

**Results:** Endurance time increased significantly after exposure to LED (from  $26\pm2s$  to  $53\pm5s$ ) as compared to PL (from  $23\pm3s$  to  $30\pm4s$ ) (F = 64, P = 0.0001). A greater decline in MF was observed during isometric endurance test after placebo, compared to LED (F = 14.6, P = 0.004). The slope of the MF over time was lower post-LED compared to post-placebo (-0.7\pm0.3 vs. -1.5\pm0.8; P = 0.004). The dyspnea score corrected for endurance time was lower post-LED (P = 0.008), but similar for fatigue both post-LED and post-PL.

**Conclusion:** A single application of LED minimizes muscle fatigue and increases isometric endurance time.

#### P621

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#### Acu-TENS reduces breathlessness during exercise in people with COPD

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The aim was to evaluate the effect of the application of transcutaneous electrical nerve stimulation of acupoints (Acu-TENS) on breathlessness during exercise. **Methods:** Individuals diagnosed with COPD were recruited in this randomized crossover study. Participants performed two incremental shuttle walk tests (ISWT) to determine an appropriate speed for the endurance shuttle walk test (ESWT). After a session for practice of the ESWT, participants attended twice, one week apart, and performed two ESWTs per visit. On each visit, the second ESWT was performed with either Acu-TENS, i.e. application of TENS onto acupoints for breathlessness (EX-B1, Dingchuan) or Sham-TENS, i.e. application of TENS onto non-acupoints on the patella, in random order, for 45 minutes prior to and during the second ESWT. The assessor was blinded to group allocation. The duration of each ESWT and the dyspnoea score (Borg scale, 0-10) at isotime of the two ESWTs on any one visit were recorded for comparison.

**Results:** Twenty-one participants, mean ( $\pm$ SD) age 71 $\pm$ 6 years, FEV<sub>1</sub> % pred 51 $\pm$ 22%, completed the study. At isotime, Acu-TENS showed a significant between-group reduction in dyspnoea of -0.7 unit (95%CI -1.2 to -0.1), p=0.016. A subgroup analysis of participants with dyspnoea  $\geq$  4 (n=12) at end of the ISWT showed a significant reduction in dyspnoea with Acu-TENS compared to Sham-TENS of -1 unit (95% CI -1.7 to -0.3), p=0.011, but not in those with dyspnoea <4 (n=9). No significant difference in endurance shuttle walk duration was observed between groups.

**Conclusion:** Acu-TENS may alleviate dyspnoea during walking in people with COPD, particularly in those who had more severe dyspnoea during exercise.

#### P622

# Functional and metabolic consequences of increasing levels of neuromuscular electrical stimulation in non-depleted patients with COPD and healthy controls

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Rationale: Neuromuscular electrical stimulation (NMES) has been progressively used to improve skeletal muscle performance in patients with COPD. It is presently unknown, however, whether NMES is able to induce similar physiological and metabolic responses in COPD patients and healthy subjects.

**Objective:** To compare functional (torque) and metabolic (deoxygenation) effects of NMES at increasing levels of stimulation in patients with COPD and age- and gender-matched controls.

**Methods:** Fifteen males with moderate-to-severe COPD (FEV<sub>1</sub>=  $46.2\pm18.1\%$  pred) and 10 controls underwent high-frequency (50Hz) NMES at 20 to 50 mA. Torque was measured by isokinetic dynamometry, muscle deoxygenation (HHb) by near infrared spectroscopy, and muscle mass by DEXA.

**Results:** Maximal voluntary contraction (MVC) was significantly lower in patients than controls; these differences, however, disappeared after muscle mass correction (p>0.05). There were progressive increases in torque and HHb with amplitude of stimulation in both groups. Although absolute torque at given level of stimulation was systematically lower in patients, MVC-corrected values were similar (20 mA and 50 mA=  $5.7\pm3.7\%$  and  $24.4\pm8.4\%$  in patients and  $6.4\pm5.2\%$  and  $22.4\pm10.0\%$  in controls, respectively). Moreover, there were no between-group differences in HHb (% cuff-induced maximal) across the stimulation intensities (p>0.05).

**Conclusions:** Our results indicate preserved functional and metabolic responses to NMES in non-depleted patients with moderate to severe COPD. These data suggest that they might derive full physiological benefit from this intervention.

#### P623

### CREWS – A validation pilot

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A previous pilot of a Community Respiratory Early Warning System (CREWS) measuring signs/symptoms with telehealth support to assess its impact on self management skills, early recognition of deterioration and subsequent health care utilisation were positive. A further validation study in 20 patients with severe COPD has now been conducted.

2 withdrew consent and 5 died due to the severity of COPD during the evaluation. 13 were invited to complete an evaluation that consisted of a visual analogue scale of their experience of using the CREWS with 1 being not useful and 5 being very useful. 3 were no longer using the CREWS although reported benefit initially in terms of recognising deteriorating health and made contact with the respiratory service. Results from the remaining 10 are reported.



100% of respondents reported the CREWS as useful/very useful. On ease of use 70% reported it very easy, 20% fairly easy and 10% easy to use the tool. 90% of respondents are still using the tool.

**Conclusion:** These responses validate the use of CREWS. It has the potential to assist in early recognition of exacerbations, improve self management skills and thus reduce hospital admission rates and will be tested in a larger population.

#### P624

Rehospitalization rates for patients with COPD who require supplemental oxygen therapy following a hospitalization for an exacerbation <u>Brian Carlin<sup>1</sup></u>, Kim Wiles<sup>2</sup>, Dan Easley<sup>2</sup>. <sup>1</sup>Pulmonary and Critical Care Medicine, Allegheny General Hospital, Pittsburgh, PA, United States; <sup>2</sup>Medicine, Klingensmith HealthCare, Ford City, PA, United States

**Objective:** To compare the hospital readmission rates for patients with COPD who require supplemental oxygen therapy following an exacerbation who are entered into a home-care based, respiratory therapist centered transition of care program. **Method:** Patients with a diagnosis of a COPD exacerbation who required supplemental oxygen therapy on hospital discharge were entered into a post hospitalization transition of care program {Discharge, Assessment and Summary @ Home

(D.A.S.H., Klingensmith HealthCare, Ford City, PA)]. The program consists of face to face visits by a respiratory therapist with the patient on days 2, 7, and 30 following hospital discharge. Education, behavior modification, skills training, oxygen titration during performance of activities of daily living, clinical assessment, and adherence data collection are components of the program. The 30 day readmission rates following discharge for all patients entered into the program over a twenty four month period (March 2010 through February 2012) were evaluated. **Results:** 385 consecutive patients with COPD (mean age 71 + 12 years) from 23 different hospitals were enrolled into the program. 123 (31%) patients refused additional follow up after the first home visit. The 30 day readmission rate for those patients who chose to continue the program (209) was 2.8%.

**Conclusions:** The use of a multiple visit respiratory therapist based patient centered management program resulted in a significant decrease in the 30 day readmission rates for those patients who elected to continue with the DASH management program.

### P625

# Current COPD care in the UK – Data from 160000 patients in the POINTS database

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**Background:** COPD is a major UK healthcare cost. Differing standards of care exist e.g.those qualifying for payment; Quality & Outcomes Framework (QOF) vs. the non-incentivised NICE guidelines.

Aims: To define a large UK wide COPD cohort and describe their primary care management compared to these standards.

**Methods:** We interrogated thePatient Outcomes and Information Service (POINTS) database of participating practices in the UK. POINTS provided by GlaxoSmithK-line UK Ltd as a service to medicine is delivered by Quintiles Data was collected between 2007-08 and 2009-10.

**Results:** 1265 GP Practices had a list size of 7million with 160000 COPD patients. 911 practices returned total list sizes (1.7% prevalence of COPD) 51,000 (32%) had a COPD review recorded yet 85000 (53%) had spirometry recorded within 15 months, 124600 had flu and/or pneumococcal vaccination status recorded (82%) yet only 15% had exacerbation frequency recorded. Increases in MRC dyspnoea score (MRCD) recording occurred from 2007 at 28% to 44% in 2009 (p<0.001). The most common prescription was short acting  $\beta$  agonist SABA in 67%, ICS/LABA combi- inhaler in 47%, LAMA in 30%. 24,000 (15%) were prescribed an ICS inhaler (out of licence and against NICE guidelines). 19000 patients with mild airflow limitation were on ICS-LABA beyond licence (FEV1 60-80%). We found 10,000 potentially misdiagnosed patients with FEV1>80%; of these 38% were on ICS-LABA and 20% were on LAMA.

**Conclusions:** Overtreatment of mild COPD with ICS-LABA or LAMA is frequent. Exacerbations rates were poorly recorded suggesting incomplete COPD reviews that may lead to failure of appropriate management. Exacerbation frequency recording should be incorporated into QOF pay.

#### P626

# The need for the integrated care for advanced COPD patients in the northern Poland (Pomerania)

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COPD is one of the most prevalent chronic disease, significantly increasing morbidity and mortality in developed countries. Symptom control and preventing risk of exacerbation is the main goal in the management of COPD. Poor compliance and insufficient self-management, especially in the more advanced patients are recognized causes of increased exacerbation rate. Currently, in the Northern Poland the model of integrated care for advanced COPD patients is to be introduced. However little is known about the need and acceptance for such a care among patients and their relatives. Thus, the aim of this initial study was to assess the QoL (using SGRQ) in 30 consecutive advanced COPD patients living one of the small towns in Pomerania and their acceptance for continuing support (two times a week during one month) delivered in their homes (assessed by specially constructed questionnaire). Home intervention included two-hours meeting (structured as follows: 30 min of education including assessment of the proper use of inhalators and medications intake, 30 min of physical activity, 30 min of small-talk focused on the subject proposed by patient, and 30 min of the assessment of symptoms, pulsoximetry and PEF measurement) with medical caregiver. Results demonstrated poor QoL in the study group during the stable period of the disease (total score of SGRQ - mean: 71; range: from 24 to 91) and the full acceptance for the home support (28 patients were very satisfied, 2 were satisfied). These findings confirmed the need for integrated care in Pomerania and chance for realization of the program.

#### P627

#### Family care in advanced COPD: Perceived difficulties and expectations of support from services

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Chronic Obstructive Pulmonary Disease (COPD) is an incapacitating, highly prevalent disease which often requires intensive support from patient's family members. However, knowledge about the difficulties experienced by family members in their caregiving role remains scarce. This study aimed to explore the difficulties experienced by family carers, and their expectations towards social and health support services.

A qualitative, cross-sectional study was conducted with 21 family carers of COPD outpatients at advanced grades (GOLD 3 and 4). Semi-structured interviews were performed to collect data. Participants were mostly female (n=20), with a mean age of 60.90±12.35 years old, spouses (n=12) and caring for more than 4 years (n=18). All interviews were audiorecorded, transcribed and submitted to content analysis by 2 independent judges.

The major difficulties reported are related to: i) provide support in basic [washing (n=6), dressing (n=2)], and in instrumental activities of daily living [preparing meals (n=4)]; ii) communication with patient (n=2); and iii) restrictions in social activities (n=2); Six carers did not identify any difficulty. Most of participants (n=12) could not identify how formal support services could help them. Only 3 participants reported the need of help to provide support in activities of daily living. Carers reported several difficulties in their caregiving role. However, they were unable to identify how social and health services could support them. The lack of information about community resources might explain these results. Strategies towards effective flow of information must be addressed in order to prevent caregivers' burden.

#### P628

## Rehospitalization rates for patients with pneumonia who require

supplemental oxygen therapy following hospital discharge <u>Brian Carlin</u><sup>1</sup>, Kim Wiles<sup>2</sup>, Dan Easley<sup>2</sup>. <sup>1</sup>Pulmonary and Critical Care Medicine, Allegheny General Hospital, Pittsburgh, PA, United States; <sup>2</sup>Medicine, Klingensmith HeatlhCare, Ford City, PA, United States

Objective: To compare the hospital readmission rates for patients with pneumonia who require supplemental oxygen therapy following an exacerbation who are entered into a home-care based, respiratory therapist centered transition of care program.

Method: Patients with a diagnosis of pneumonia who required supplemental oxygen therapy on hospital discharge were entered into a post hospitalization transition of care program {Discharge, Assessment and Summary @ Home (D.A.S.H., Klingensmith HealthCare, Ford City, PA)]. Patients with a diagnosis of COPD were excluded from this analysis. The program consists of face to face visits by a respiratory therapist with the patient on days 2, 7, and 30 following hospital discharge. Education, behavior modification, skills training, oxygen titration during performance of activities of daily living, clinical assessment, and adherence data collection are components of the program. The 30 day readmission rates following discharge for those patients entered into the program over a twenty four month period were evaluated.

Results: 22 consecutive patients with pneumonia from 23 different hospitals were enrolled into the program over the two year period. None (0%) of the patients were rehospitalized within the first thirty days following hospital discharge.

Conclusions: The use of a multiple visit respiratory therapist based patient centered management program resulted in a significant decrease in the 30 day readmission rates for those patients who were discharged following a hospitalization for pneumonia.

#### P629

### Psychologicl distress in asthma and COPD

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Background: The effective control of asthma requires a treatment regimen that may be compromised by psychological factors, such as anxiety and depression. The aim of our study is to estimate the prevalence of anxiety and depression among adults with stable persistent asthma.

Methods: We analyzed the data from 50 adult patients with persistent asthma (group A). Fifty patients with COPD (GOLD II-IV) were the control group (group B). The pulmonary function test was performed by spirometry. Depression and anxiety scores were assessed by Hospital Anxiety and Depression Scale. The prevalence of anxiety and depression was calculated in both groups and the difference between groups was estimated. The correlation between pulmonary function parameters and psychological distress was calculated.

Results: The anxiety score in Group A was 6.2±2.3 and in Group B 7.87±4.35. The depression score in Group A was  $4.9\pm2.4$  and in Group B  $7.97\pm4.04$ . The difference between groups was significant for both anxiety and depression (p<0.05). There was no correlation between psychological status and pulmonary function tests in group A (p>0.05) and in group B (p>0.05).

Conclusion: This research suggests the importance of psychological distress screening for patients with persistent asthma, as COPD also. Further studies are needed to examine the correlations between the severity of the respiratory disease and mental status and to target the psychological factors that contribute worsening asthma and COPD.

### P630

#### Influence of anthropometric characteristics in expiratory reserve volume of morbidly obese

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Introduction: The reduction of the expiratory reserve volume (ERV) is considered the most consistent finding for changes in lung volume in morbid obesity. The importance of decreased ERV in morbid obesity is attributed to the known association between these volumes with the closure of small airways, which causes hypoxemia.

Objective: Was to correlate ERV with anthropometric characteristics of morbid obese women.

Methods: Cross-sectional study with morbidly obese (BMI ≥ 40kg/m<sup>2</sup>) and control group (BMI between 18.5 and 24.9 kg/m<sup>2</sup>), both with normal lung function. The body mass index (BMI), waist circumference (WC), waist-hip ratio (WHR), and neck circumference (NC) were measured. Subsequently, pulmonary function test were performed.

Results: A total of 30 morbidly obese (BMI 44.7±4.11 kg/m<sup>2)</sup> and 30 lean women (BMI 22.1±1.8 kg/m<sup>2</sup>) were evaluated. ERV was significantly lower in obese [0.28 (0.14L-0.60 L)] when compared to lean women [0.74 (0.51L-1.08L)] The percentage of predicted values of forced expiratory volume in one second (FEV1) were significantly lower in morbidly obese (88.31±4.31L/min) when compared to lean women (102.75±13.2L/min). There were no differences in forced vital capacity (FVC), the ratio FEV<sub>1</sub>/FVC. There was negative correlation between body mass, BMI, waist circumference (WC), waist-to-hip ratio (WHR) and neck circumference (NC) with ERV, respectively (r=- 0.3757, -0.4112, -0.4771, -0.03456, -0.5145). Conclusions: The ERV is influenced by body mass, BMI, WC, WHR and NC.

#### P631

#### Association between the mini nutritional assessment and the COPD assessment test

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Background: The Mini Nutritional Assessment® (MNA) has not been studied extensively in COPD patients.

Objectives: We evaluated whether COPD patients with impaired health status as determined by the COPD Assessment Test (CAT) have poor nutritional status according to the MNA.

Methods: We recruited clinically stable male COPD outpatients (age, ≤65 years) for a cross-sectional study. We conducted the following examinations: pulmonary function tests, nutritional assessment using the MNA questionnaire (high scores indicate good nutritional status), the CAT, and dyspnoea evaluation. The patients were divided into 2 groups: (A) those with CAT scores  $\geq 10$  and (B) those with CAT scores <10. We also calculated 4 scores exploring the domains of the nutritional status from the MNA questionnaire: anthropometric, general, dietary, and subjective scores.

Results: The study included 68 patients (mean age, 75.4 years). The total score was significantly correlated with FEV1% predicted, BMI, the modified Medical Research Council dyspnoea score, and the CAT score (Spearman's rank correlation coefficient,  $\rho = 0.298$ , p = 0.013;  $\rho = 0.701$ , p < 0.0005;  $\rho = -0.373$ , p = 0.002; and  $\rho = -0.363$ , p = 0.002; respectively). Group (A) (n = 47) had significantly lower total, general, dietary, and subjective scores than group (B) (n = 21) (p = 21)0.003, p = 0.029, p = 0.045, and p = 0.014, respectively, Mann-Whitney U-test). Conclusions: The nutritional status as determined by the MNA was associated with pulmonary function, dyspnoea, and the COPD-related health status. In addition, the nutritional status as determined by the MNA was significantly lower in COPD

#### P632

#### Usability of digital media in patients with COPD: A pilot study

patients with CAT scores  $\geq 10$  than in those with CAT scores < 10.

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Digital media can serve as the main interface between the patient and the care-

giver in home monitoring solutions. The selection of the most appropriate digital medium for the specific target group is critical to ensure compliance with the home monitoring system. This pilot study aims to gather insights from patients with Chronic Obstructive Pulmonary Disease (COPD) on the ease-of-use, efficacy, effectiveness and satisfaction of different types of digital media. Five off-the-shelf digital media devices were tested on 9 patients with COPD at CIRO+ in Horn, The Netherlands. Usability was evaluated by asking patients to use each device to answer questions related to their symptoms and health status. Subsequently, patients completed a paper-based questionnaire, which assessed prior experience with digital media, device dimensions, controllability, response speed, screen readability, ease-of-use, and overall satisfaction. After testing all the devices, patients ranked the devices according to their preference. We identified the laptop as the preferred device due to its good controllability, fast response time and large screen size. The Smartphone was the least favorite device as patients found the device and screen size to be too small, which made it difficult to interact with. The pilot study has provided important insights to guide the selection of the most appropriate type of digital medium for implementation in home monitoring solutions for patients with COPD. As the digital medium is an important interface to the patient, it is essential that patients feel motivated to interact with the digital medium on a regular basis.

#### P633

## A home telehealth service for patients with severe COPD. The PROMETE study

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**Goal:** To establish the efficacy of a home telehealth service in patients with severe COPD, measured as the reduction in the number of hospitalisations, the length of hospital stay, A&E visits and deaths, due to COPD exacerbations.

**Materials and methods:** The PROMETE study is a randomised controlled trial including two groups, conventional healthcare and another home telehealth, with 30 patients participating in each group. The trial was performed by the Pneumology Department from the Hospital Universitario La Princesa (Madrid, Spain) and coordinated with four local Primary Care Centers. Telehealth equipment, home service, technical assistance and specialized telehealth triage center was provided by Air Products Healthcare.

Patients included in the trial suffered severe COPD, GOLD stage IV, with at least an exacerbation episode that leaded to hospitalization in the year prior to inclusion in the trial.

Vital signs like blood pressure, heart rate, blood oxygen saturation and pick-flow where monitored in a daily bases.

**Results:** In the first three months of monitoring, 74 red alerts (clinical alerts) were detected. These alerts were evaluated upon severity and immediate clinical response was activated. The intervention group (home telehealth) experienced 10 A&E visits, 6 hospital admissions (with 44 cumulative days of stay), and 1 death due to a COPD exacerbations. While the control group experienced 30 A&E visits, 21 hospital admissions (with 239 cumulative days of stay) and 3 deaths.

**Conclusions:** Home Telehealth Services are effective in the follow-up of patients with severe COPD, and considerably reduce the number of hospital admissions and A&E visits, as compared with the control group.

#### P634

#### Can controlled oxygen be safely given in the home environment?

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Introduction: Long term oxygen therapy is a widely used treatment in end stage COPD. Uncontrolled oxygen therapy can be dangerous due to CO2 retention. In hospital these patients would often receive controlled oxygen via Venturi mask systems (VMS). Historically VMS have not been used in the community as they may cause concentrators to alarm and may not deliver an accurate FiO2. With newer concentrators and VMS available, we wanted to know if accurate FiO2 could now be practically delivered.

Aims: To compare the actual delivered oxygen concentration versus the manufacturers expected oxygen concentration through various combinations of VMS and oxygen concentrators.

**Methods:** We measured percentage oxygen output at manufacturers recommended flow rates via a concentrator. We tested three makes of VMS (Respironics, Salter Labs and Intersurgical) and 2 types of concentrator, the AirSep New Life Elite 0-51/min and the AirSep VisionAire3 0-3 1/min. We also tested the VMS with the hospital oxygen supply.

**Results:** The average differences from the stated percentage for the 3 makes of VMS via the concentrators were 2.2% (Respironics), 1.4% (Salter labs) and 1.1% (Intersurgical). For walled oxygen it was 4.2%, 0.3% and 1.6%. Some combina-

tions of oxygen source and VMS delivered oxygen that was higher than expected. This occurred in 45% of cases via the concentrator and 81.8% of cases via the walled oxygen. For all VMS the oxygen percentage delivered was lower or equal when using concentrators than from the wall oxygen source. The use of VMS with oxygen concentrators did not trigger the devices used to alarm.

**Conclusion:** Oxygen delivered by a VMS and a home concentrator appears safe compared to controlled oxygen in hospital.

#### P635

# Long-term oxygen therapy (LTOT): Retrospective audit on ten years prescriptive appropriateness

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**Background:** Guidelines focus on three key issues for appropriate prescription of LTOT: patients should be nonsmokers, in a stable condition, and they should use oxygen for at least 15 h/day,

**Aim:** To evaluate prescriptive appropriateness in a group of patients with Chronic Respiratory Failure during a period of ten years.

**Methods:** 702 patients (mean age  $74\pm11$ , 56% males) were prescribed with LTOT between 2002 and 2011. Prescriptive appropriateness based on PaO2 or non invasive SaO2, as indicated by the ERS guidelines.

**Results:** O2 source: 84.1% liquid, 13.5% concentrator, and 2.3% gas. Main reason for prescription was pulmonary: 88.4%, 69.1% for COPD. Among patients with PaO2 and SaO2 traceable values (n=609), the prescription resulted appropriate for 240 (39.4%). Pneumologists showed higher prevalence of LTOT appropriateness than other prescriptors: difference not significant. We noted low appropriateness from 2002 to 2006, followed by a constant improvement: at that time we performed an educational program for all prescribers. On 2011 we noted a new drop in appropriateness.

**Conclusion:** The results confirm that a considerable amount of patients are inappropriately prescribed. Efforts need to improve the adherence to the published international guidelines for LTOT prescription through continuous educational programs aimed to all prescribers.

#### P636

#### **Formal oxygen assessment; improving patient safety and reducing cost** <u>Katherine Ibison</u><sup>1</sup>, Nick John<sup>2</sup>, Koothali Srinivasan<sup>2</sup>, Harmesh Modgil<sup>2</sup>. <sup>1</sup>*Respiratory Medicine, Royal Wolverhampton Hospitals NHS Trust, Wolverhampton, West Midlands, United Kingdom;* <sup>2</sup>*Respiratory Medicine,*

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**Introduction:** Home oxygen prescribing in the UK has improved significantly, but it can still be ordered without the need for formal oxygen testing. **Results:** Data were analyzed from 134 consecutive patients attending formal

oxygen assessment at the Princess Royal Hospital, Telford. The patient's primary diagnoses are shown in Figure 1. They had a mean age of 72.2 (range 42-91) and 75% were on one or more modalities of oxygen prior to formal assessment (38%



Figure 1. Primary diagnosis of patients attending for formal oxygen assessment.





99s

short burst, 53% ambulatory, 47% long term). The oxygen was prescribed mainly by Respiratory Nurses (40%) and General Practitioners (31%).

A pO<sub>2</sub> of  $\leq$ 8kPa was found in 89% of patients with oxygen saturations of  $\leq$ 92%. However, only 2% with saturations above 92%, had a  $pO_2$  of  $\leq 8kPa$ . A clinically significant (≥4%) desaturation was seen in 15 out of 16 patients during ambulatory oxygen assessment. The outcome following the formal oxygen assessment is shown in Figure 2.

Conclusions: Reassessment of patients already on oxygen is worthwhile and may improve patient safety and cost-eficiency. Oxygen saturations of ≤92% should be used to screen patients being considered for oxygen assessment. Ambulatory assessment is under-utilized.

#### P637

Ventilatory responses during 6-min walk test in stable COPD patients <u>Masahiro Satake<sup>1</sup></u>, Takanobu Shioya<sup>1</sup>, Hitomi Takahashi<sup>2</sup>, Keiyu Sugawara<sup>2</sup>, Chikage Kasai<sup>2</sup>, Noritaka Kiyokawa<sup>2</sup>, Toru Watanabe<sup>2</sup>, Sayaka Sato<sup>2</sup>, Atsuyoshi Kawagoshi<sup>3</sup>, Mitsunobu Homma<sup>4</sup>. <sup>1</sup>Physical Therapy, Akita University Graduate School of Health Sciences, Akita, Japan; <sup>2</sup>Rehabilitation, Akita City General Hospital, Akita, Japan; <sup>3</sup>Rehabilitation, Higashi Inaniwa Clinic, Akita, Japan; <sup>4</sup>Pulmonary Medicine, Akita City General Hospital, Akita, Japan

Aim: The purpose of this study was to evaluate the ventilatory responses during the 6-minute walking test (6MWT) in stable COPD patients

Subjects and methods: 23 patients with stable COPD (23 male, age;  $75.5\pm6.4$ years (mean±SD), BMI; 22.5±3.8, FEV1: 56.1±21.2%pred) took part in this study. Throughout the 6MWT, oxygen uptake (V'O2), carbon dioxide production (V'CO<sub>2</sub>), minute ventilation (V'E), and heart rate (HR) were measured using a portable cardiopulmonary exercise system (MetaMax 3B, Cortex, Germany). Dyspnea and oxygen saturation were recorded at the end of each minute during the 6MWT. Dyspnea was measured using the Borg 0-10 dyspnea scale. The IC was measured at every two minute during the 6MWT. These data were compared with those of incremental cycle ergometer test (ICET)

Results: This study showed that the distance walked in the 6MWT was 505.7 $\pm$ 100.4 m, the peak V'O<sub>2</sub> was 12.9 $\pm$ 2.5 ml/min/kg, the peak V'CO<sub>2</sub> was 12.5±3.2 ml/min/kg, the peak V'E was 28.2±9.2 L/min, the Borg dyspnea scale at the end of the 6MWT was  $4.6\pm2.2$ , and the oxygen saturation showed  $89.3\pm2.9\%$ . During the 6MWT, V'E/V'O2 and V'E/V'CO2 curve decreased for 2 minutes, and then showed a leveling off, while these curve inflected upward during the ICET. Conclusions: These data suggested that the ventilation equivalent at two minutes was most efficient and that respiratory metabolism was below anaerobic threshold during the 6MWT in stable COPD patients.

#### P638

#### The effect of corticosteroid use on skeletal muscle function in patients with interstitial lung disease

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Background and objective: Many patients with interstitial lung diseases (ILDs) may have reduced skeletal muscle strength. Corticosteroid as maintenance therapy are often used in these patients and known to have many side effects including muscle weakness. However, the effect of corticosteroid on skeletal muscle strength is uncertain. The purpose of this study was to examine the effect of maintenance corticosteroid use on skeletal muscle strength in patients with stable ILDs.

Methods: Eighty-two ILDs patients were studied. Subjects were divided into with or without oral corticosteroid therapy, and skeletal muscle strength were evaluated. Results: Handgrip and quadriceps forces were less in patients taking corticosteroid than without steroid. There were significant correlations between % predicted quadriceps force and mean daily dose (r = -0.260, p = 0.019), duration (r = -0.276, p = 0.013), and total dosage (mean daily dose\*duration, r = -0.289, p = 0.009) of corticosteroids use.

Conclusions: Corticosteroid usage significantly affected skeletal muscle strength in patients with ILDs. Moreover, skeletal muscle weakness may be associated with increasing daily dose and duration of corticosteroids.

#### P639

#### Validity of the visual simplified respiratory questionnaire (VSRQ) in pulmonary rehabilitation

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Introduction: Evaluating health-related quality of life (HRQL) in pulmonary rehabilitation (PR) is important. The St George's Respiratory Questionnaire (SGRQ) is a disease-specific measure often used as a reference test in clinical trials. However, its lengths of completion limits its routine used. The Hospital Anxiety and

Depression Scale (HAD) focused only on psychological distress. The VSRO is a new tool designed to assess HRQL in patients with COPD (Perez T, et al. Int J Chron Obstruct Pulmon Dis. 2009). The aim of this study was to assess the clinical interest of this test in the evaluation of patients HRQL in PR.

Methods: We enrolled 138 consecutive patients with chronic lung diseases who underwent a PR in a monocenter, prospective study (CEPRO 2011-036). The global score of the VSRQ (scored from 0 to 80 with 8 questions), SGRQ (scored from 0 to 100 with 8 parts) and HAD (scored from 0 to 42 with 7 questions for anxiety evaluation and 7 for the depression) were measured at the beginning and the end of a six week outpatient PR. HRQL improvement was measured by the increase of the VSRQ score and the decrease of the SGRQ and HAD scores.

**Results:** The VSRQ correlated with the SGRQ (r=-0.49, p=0.01) and the HAD (r=-0.47, p=0.01). After PR, there was a significant improvement of the VSRQ (46 vs 39, p<0.001), SGRQ (38.3 vs 42.3, p=0.019) and HAD (14 vs 15.1, NS). The VSRQ increase correlated with the SGRQ decrease (r=-0.39, p=0.01).

Conclusions: The VSRQ score correlates with the SGRQ and HAD scores. Our data demonstrate the clinical interest of this simplified test to evaluate the HRQL in PR