494. Pulmonary rehabilitation: looking at alternative approaches and alternative populations beyond COPD

P4797

Pulmonary rehabiliation: First line treatment for respiratory disease

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Introduction: Breathing Space is a multi-disciplinary primary care centre for the management of respiratory conditions in Rotherham, England. Breathing Space has an emphasis on Pulmonary Rehabilitation (PR) incorporating outpatient pulmonary rehabilitation and an inpatient facility.

Aims: The aim of the research was to establish the effect of PR on Patient Recorded Outcome Measures.

Methods: Data was examined retrospectively between June 2007 and December 2010. All patients underwent field walking tests (Incremental Shuttle Walk Test (ISWT), Endurance Walking Test (EWT) or 6 Minute Walk Test (6MWT)) and CRQ (self report) and HAD questionnaires. PR was provided over 12 sessions in a 6 week period.

Results: 94 patients with Bronchiectasis or Pulmonary Fibrosis were referred for PR. Of these 95% (n=78) agreed to attend PR after assessment. Refer to tables 1 & 2 for results.

Results for walking tests

	Bronchiectasis	Pulmonary Fibrosis
Invited	74% (n=60)	26% (n=22)
Female	57% (n=34)	41% (n=9)
Completion rate	97%	91%
Median ISWT pre	215M	207M
Median ISWT post	288M*	136M*
Median 6MWT pre	108M	75M
Median 6MWT post	138M	95M
Median EWT pre	6mins 39	4mins 52
Median EWT post	16mins 33	13 mins 57

*Denotes clinically significant result.

Results of Health Status Measures

		Bronchiectasis	Pulmonary Fibrosis
Median CRQ-SR Pre	Dyspnoea	3.13	2.55
	Fatigue	3.07	2.42
	Emotion	4.10	3.64
	Mastery	4.11	3.70
Median CRQ-SR Post	Dyspnoea	3.76*	3.08*
	Fatigue	3.90*	3.67*
	Emotion	4.78*	4.83*
	Mastery	4.20	4.84*
HAD	anxiety pre	8.3	8.47
	post	6.0*	6.46*
HAD	depression pre	7.3	7.9
	post	6.05*	6.31*

*Denotes clinically significant result.

Conclusion: Our data suggests that PR for patients diagnosed with Bronchiectasis or Pulmonary Fibrosis should be the treatment of choice.

P4798

Effect of pulmonary rehabilitation on gas exchange, muscle cross section area and functional parameters in interstitial lung disease

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Introduction: Pulmonary rehabilitation has an important role in the management of interstitial lung diseses (ILD). This study evaluates effect of pulmonary rehabilitation on gas exchange, muscle cross sectional area and functional parameters in patients of ILD.
Aims and objectives: To evaluate 6 minute walk distance (6MWD), Mid Thigh Cross Sectional Area on CT ($MTCSA_{CT}$) and Carbon Monoxide Diffusion Capacity (DLCO) before and after pulmonary rehabilitation in patients of ILD.
Methods: Twenty eight patients of ILD were randomly allocated to Control and Test groups. The control group received standard medications for 8 weeks while the test group was given supervised pulmonary rehabilitation along with standard medications for 8 weeks.
Results: Mean values of 6MWD changed from 476.50±61.97 m to 482.64±58.33 m in control group [p=0.369]and from 455.64±63.55 m to 509.78±69.03 m in test group [p=0.015].
Levels of DLCO changed from 11.88±4.38 ml/min/mmHg to 11.62±4.00 ml/min/mmHg in control group [p=0.399] and from 10.80±3.73 ml/min/mmHg to 13.08±3.87 ml/min/mmHg [p=0.004] in test group.
Mean values of $MTCSA_{CT}$ changed from 9311.21±1987.21 cm^2 to 9271.07±1918.42 cm^2 in control group [p=0.646] and from 9485.21±2083.44 cm^2 to 10330.71±2137.41 cm^2 in test group [p=0.031].
The difference of means between control and test groups after pulmonary rehabilitation was significant for DLCO, $MTCSA_{CT}$ and 6MWD. Positive correlation was obtained between $MTCSA_{CT}$ and 6MWD [r=0.7, p=0.006].
Conclusion: Pulmonary rehabilitation causes significant improvement in muscle cross sectional area and functional parameters in ILD patients along with significant improvement in gas exchange.

P4799

Pulmonary rehabilitation (PR) outcomes in chronic obstructive pulmonary disease (COPD) compared with interstitial lung disease (ILD)

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Background: PR is effective in improving exercise capacity, dyspnoea and quality of life in patients with COPD. The benefits in patients with ILD are less well described.
Methods: The records of 24 patients (15 male) with ILD who had completed PR were compared with age (within 2 years) and MRC score (same score) matched COPD patients (19 male) who had also completed PR within the same setting.
Incremental shuttle walk distance (ISWT), endurance shuttle walk time (ESWT), level of exercise induced desaturation, chronic respiratory disease questionnaire (CRDQ) scores and hospital anxiety and depression (HAD) scores were measured at baseline and on completion of the 8 week programme. The mean changes in each group were compared using a paired t-test.
Results: The mean average age of each group was 68 years, with a mean average MRC score of 3.3. The baseline oxygen saturations in both groups was similar.

Differences in outcomes between COPD and ILD groups

	COPD	ILD
ΔISWT (m)	36.2	31.5
ΔESWT (seconds)	506.1	303.7
ΔDyspnoea (CRDQ)	3.5	4.3
ΔMastery (CRDQ)	1.2	2.5
ΔEmotional function (CRDQ)	4.1	3.7
ΔFatigue (CRDQ)	3.2	2.5
ΔAnxiety (HAD)	–1.1	–1.4
ΔDepression (HAD)	–1.8	–1.2

Both groups showed improvements in all measured outcomes-most of which were clinically important. There was no statistically significant difference between the groups in any of the outcomes. In addition, the level of exercise desaturation after PR was greater in the ILD group (7.7%) compared with the COPD group (3.0%).
Conclusions: This study shows that PR in patients with ILD produces similar outcomes to those seen in COPD. The exercise induced oxygen desaturation seen in patients with ILD is greater.

P4800

Exercise tolerance and symptoms after standard rrehabilitation in emphysema-like COPD patients

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In this retrospective analysis on a cohort of 823 COPD patients (age 71±8 yrs, FEV_1 56±18% pr.) admitted in 3 centres, we aimed at describing the effect of standard rehabilitation on exercise tolerance and symptoms in the subgroup of emphysema-like individuals, as defined by lung function parameters.
Pre-to-post changes (D) in exercise tolerance (6MWT), Borg dyspnea (D), fatigue (F) and $SatO_2$ nadir (N) on effort, perceived breathlessness (MRC), and quality-of-life (SGRQ) were reported. Proportion of patients reaching the minimally clinical important difference (MCID) in 6MWT, D, F, MRC and SGRQ were also recorded. Outcomes were then compared between the Emphysema (*E*, n=283) and the COPD (*C*, n=540) subgroups.
Lung functions were different by definition when comparing the two groups, with similar age, body mass, exercise tolerance, and breathlessness at baseline.
D-6MWD (+72±47 and +62±42 m, p=0.002), D-D (-2.3±1.7 and -1.9±1.3 point, p=0.002), D-F (-2.2±1.9 and -1.9±1.6 point, p=0.070), and D-N (+1.4±3.0 and +0.5±3.3 point, p=0.002) were higher, whereas a larger proportion of patients improved at the MCID in 6MWT (62% and 54%, p=0.040) in group E when compared with group C. Using a multivariate logistic regression model, we found that higher normalised PaO_2, and lower 6MWT, and FRC at baseline significantly correlated with D-6MWT within the E group ($p<0.01$).
This study generates the hypothesis that COPD patients with emphysema phenotype are more likely to gain exercise tolerance and perceived symptoms after standard rehabilitation.

P4801

Does better endurance capacity increase physical performance and work participation for patients with obstructive pulmonary disease?

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Background: Patients with chronic lung disease have increased risk of unemployment and disability pensioning caused by exacerbations and the complexity of this disease. Multidisciplinary pulmonary rehabilitation could be expected to improve physical performance, work stability and participation.
Aim: The aim of this study was to evaluate if a 4 weeks' multidisciplinary vocational pulmonary rehabilitation had an effect on endurance capacity, and whether a change was correlated with degree of physical activity and work participation 1, 6 and 12 months post-rehabilitation.
Method: 128 consecutive patients were included in this intervention prospective cohort study. Endurance capacity was measured as time to exhaustion during constant work load treadmill walk before and after rehabilitation. Data on post-rehabilitation work relations and physical performance was collected by telephone interview.
Results: The endurance capacity increased from 360 sec to 840 sec (median), p=0.001during the 4 weeks of rehabilitation. Increase in treadmill endurance time was correlated with physical activity 6 months (r=0.22, p=0.023), but not 12 months post-rehabilitation (r=0.03, p=0.776). There was no correlation between increase in treadmill endurance and work participation 6 or 12 months after rehabilitation.
Conclusion: Patients experiencing the largest improvement in physical endurance after participation in the current rehabilitation model were most likely to continue their physical activity 6 months after rehabilitation, but the effect was lost after 12 months. The degree of improvement in physical condition did not influence work participation.

P4802

Exercise physiologic response during three different video games in cystic fibrosis patients

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Cystic fibrosis (CF) is a multisystemic disease characterized by an abnormal ventilation response that limiting the exercise tolerance. Physical training increases exercise capacity, decreases dyspnea and improves quality of life. Adherence to respiratory rehabilitation programs is a key factor to guarantee optimal benefits.
To determine the efficiency of three Wii video games as training systems by analysing the physiologic response in CF.
Methods: We included 24 CF patients: age: 12±3.7 years; BMI: 18±3; FVC: 97±20%; FEV1: 93±20%, followed 4 different exercise types in randomized order

during six minutes: 1) 6-min walking test (6MWT); 2) Wii Fit Plus (Wii-Fit); 3) Wii Active (Wii-Acti), and 4) Wii Family Trainner (Wii-Train). All physiologic responses were recorded breath by breath by using a portable gas analyzer (Fitmate Pro, Cosmed, Italy).
Results: In all video game exercises, after the 3th minute, describe a plateau profile that remains stable until the end of the test, similar to the 6MWT.

	6MWT	Wii-Fit	Wii-Acti	Wii-Train
Final VO2 (mL m^{-1})	992.4±294.3	547.9±111.9***	1218.7±431.5*	1195.4±323.7*
Final VE (L m^{-1})	32.1±9.1	17.5±4.3***	38.8±14.9*	36.65±9.1*
Final HR (bpm)	160±17	123±14***	158±13	164±16
Final dyspnea (Borg)	2.5±2.3	1.4±2***	3±2.8	2.7±2.5
Final fatigue (Borg)	2.7±2.5	1±1.3***	2.3±2.1	2.8±2.7

Conclusion: From a physiological perspective, exercises executed with video game platforms are feasible and allow high intensity time-sustained exercise. This type of training could be recommended for CF patients.
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P4803
Physical rehabilitation in asthma management
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Background: 50% of asthma patients experiences limitations in physical activity and usual lifestyle. Gymnastics can provide significant health benefits and improve quality of life.
Objective: To investigate effects of gymnastics on asthma patients, specifically leading to ameliorated lung function.
Methods: A prospective, randomized, controlled trial was performed to evaluate the effect of respiratory gymnastics (RG). 85 patients with moderate/severe asthma were randomly assigned to control (CG - 16 persons, standard therapy) or RG (RGTG - 69 persons, standard therapy & RG) group; with no significant difference in demographics. Patients were instructed how to practice exercises and examined in 3-6-9-12 months for pulmonary function, cardiopulmonary exercise and control of asthma.
Results: 12 month physical rehabilitation (with pharmacotherapy) reduced: the frequency of complaints; clinical manifestations of asthma; symptoms: daytime (from 94.0% to 28.0%; p = 0.0001) and night (from 54,7% to 7,1%; p = 0,0001); the consumption of β2-agonists (from 3,2 to 2,1 puffs/week). RGTG group increased: FEV1 (from 1,3 to 1,7 L); PEF (from 338,6±19,5 to 403,5±15,8); exercise capacity (W/kg) from 0.85±0.1 to 1.4±0.1. The number of patients with limited physical activity decreased from 86.0±5.0 to 22.0±5.9%; p = 0,001. Heart rate and blood pressure recovery time after exercise decreased from 10,4±0,7 to 9,1±0,6 min (p <0,05). CG changes were much lower (difference between groups was significant, p < 0,001).
Conclusions: Individual programs of RG reduced asthma symptoms and the use of bronchodilator medication in patients with asthma, and can be effective as an adjuvant therapy and optimize asthma patients medical treatment.

P4804
Obesity in COPD and the response to pulmonary rehabilitation
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The obesity paradox is well recognized in COPD. Obese (OB) patients with COPD may have better survival than the non-OB, yet obesity may impair lung function, increase respiratory load and dyspnea. We hypothesized that OB COPD patients referred to pulmonary rehabilitation (PR) would have reduced exercise capacity and quality of life compared with normal weight (NW) COPD patients, and would respond less well to PR.
As BMI<21 is associated with worse prognosis, we defined NW as a BMI of 21-24.9. OB was defined as BMI 30 plus. In 218 patients referred to an 8-week outpatient PR program, we identified 64 NW and 67 OB patients. Baseline and post-PR incremental shuttle walk (ISW), self-report Chronic Respiratory Disease Questionnaire (CRDQ-SR), MRC Dyspnea score (MRC), Hospital Anxiety and Depression (HAD) scores and fat free mass (FFM) were recorded.
Despite less severe airflow obstruction in OB patients (Median IQR FEV1% predicted: NW = 40 (26, 62) vs. OB = 62 (42, 76); p<0.001), median ISW (m) was reduced (NW = 185 (120, 295) vs. OB = 105 (50, 255); p=0.01). CRDQ-SR was also significantly reduced (p=0.02) in OB patients. Following PR, there was a significant improvement in ISW, CRDQ-SR, MRC and HAD-D in OB patients. No significant difference was seen in pre- to post-PR changes in ISW, CRDQ-SR, MRC, HAD and FFM between the 2 groups.
Obesity in COPD was associated with less impairment in respiratory function, but worse exercise capacity and quality of life. However OB patients respond equally well to PR as NW patients. The impairment of exercise capacity and quality of life in OB COPD patients may lead to presentation to health care professionals at an earlier stage of lung function impairment and may explain the obesity paradox.

P4805
Outpatient vs. home-based pulmonary rehabilitation in COPD: A randomized controlled trial
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Introduction: Chronic obstructive pulmonary disease (COPD) is a common cause of morbidity and mortality affecting a large number of individuals in both developed and developing countries and it represents a significant financial burden for patients, families and society. Pulmonary rehabilitation (PR) is a multidisciplinary program that results in an improvement in dyspnea, fatigue and quality of life. Despite its proven effectiveness and the strong scientific recommendations for its routine use in the care of COPD, PR is generally underutilized and strategies for increasing access to PR are needed. Homebased self-monitored pulmonary rehabilitation is an alternative to outpatient rehabilitation. In the present study, patients with mild, moderate and severe COPD submitted to either an outpatient or at-home PR program for 12 weeks were analyzed.
Methods: Patients who fulfilled the inclusion criteria were randomized into three distinct groups: an outpatient group who performed all activities at the clinic, a home-based group who performed the activities at home and a control group. PR consisted of a combination of aerobic exercises and strengthening of upper and lower limbs 3 times a week for 12 weeks.
Results: There was a significant difference in the distance covered on the six-minute walk test (p<0.05) and BODE index (p<0.001) in the outpatient and at-home groups after participating in the rehabilitation program compared to baseline.
Conclusion: A home-based self-monitoring pulmonary rehabilitation program is as effective as outpatient pulmonary rehabilitation and is a valid alternative for the management of patients with COPD.

P4806
Improvement in skeletal muscle dysfunction after twice-weekly exercise training in COPD patients
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Introduction: Skeletal muscle dysfunction is one of the extrapulmonary effects in patients with COPD, resulting in reduced peripheral muscle strength and functional capacity and have been associated to increased mortality risk. It is unknown the optimal frequency of exercise training to optimize the effectiveness of rehabilitation.
Aim: To compare the effects of the 12-wk training period of low-volume frequency on maximal strength and muscle power.
Methods: Thirty-six moderate to severe COPD men were divided into resistance group (RG, n=14), combined group (REG, n=14) and control (COG, n=8).RG and REG performed a low volume exercise training for 12 weeks. The subjects were tested for maximal strength in the leg press ($1RM_{LP}$), lower limb power at 70%1RM ($PO70\%_{LP}$), maximal strength in chest press ($1RM_{CP}$) and seated row ($1RM_{SR}$). Statistical analyses were performed with SPSS.
Results: $1RM_{LP}$ increased 26% (from 189±52 to 238±68kg, P<0.001) in REG, 33% (from 189±56 to 250±89kg, P<0.001) in RG and was higher (P<0.05) than in the CG. $1RM_{CP}$ increased 31% (from 50±12 to 66±18kg, P<0.001) in RG, 35% (from 51±17 to 67±17kg,P<0.001) in REG and was higher (P<0.001) than in CG. $1RM_{SR}$ increased (P<0.001) 31% in REG and 41% in RG compared to CG. $PO70\%_{LP}$ increased 50% (from 557±290 to 725±258 w, P<0.001) in REG, 33% (from 601±167 to 797±212 w, P<0.001) in RG.
Conclusions: Twice-weekly resistance exercise improves lower and upper body maximal strength and lower muscle power in COPD. Once-weekly resistance training is as effective in eliciting improvements in maximal strength and muscle power as twice-weekly resistance training.
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P4807
Interest of neuromuscular electro-stimulation (NMES) in COPD patients during an ambulatory comprehensive respiratory rehabilitation program
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Introduction: COPD often leads to peripheral muscle atrophy and weakness.

NMES is commonly used to improve muscle function and structure and is currently considered as an adjunct to exercise training in COPD patients with severe muscular deconditioning. The optimal parameters of stimulation and its indication in COPD patients are not yet well known.
Aim of the study: To determine the interest of NMES in COPD patients during an ambulatory comprehensive respiratory rehabilitation program (RRP).
Material and methods: We included prospectively 16 COPD patients GOLD 3-4 who take part to a RRP during 12 weeks. The subjects were all unable to walk more than 350 meter at the 6-minute walking distance (6MWD) and were randomized in two groups:
– 8 patients performing the RRP (group R)
– 8 patients performing the RRP plus NMES (group R-ES)
We assessed the spirometry, the 6MWD, the VO2 max, the maximal work load developed on the cyclo-ergometer, the quality of life as well as the evaluation of the strength and the endurance of the quadriceps at T0 and T12 weeks.
NMES was performed bilaterally on the quadriceps of the vastus medialis and vastus lateralis.
Results: We observed that the addition of NMES sessions as complementary technique to respiratory rehabilitation significantly increased the quadriceps strength (+21, 6%), as well as the quality of life (+30%), associated with a significant increase of the 6MWD (+25%) in the group R-ES compared with the group R.
Conclusion: Further studies are needed to identify the physiologic mechanisms involved in the improvements after NMES as well as its place as adjunct therapy in respiratory rehabilitation.

P4808
Peripheral muscle electrostimulation: Cardiovascular response in COPD patients and long term effects
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Conventionnal pulmonary rehabilitation (PR) suppose minimal active exercise. Because the ventilatory limitation, severe COPD patients are not always able to fully participate. Electrostimulation (ESM) of the peripheral muscles helps to prevent total unuse of the patients muscles and could aim to a complete PR program. The long term benefits of this intervention may be evanescent. The cardiovascular effects of ESM are not known in severe to very severe COPD patients.
We prospectively studied 9 COPD patients (3 females and 6 males, mean age of 65 y/o, mean FEV1 of 0,78 L (28%)) undergoing home-based peripheral muscles ESM. This latter consisted of 5 periods of 20 minutes, 5 times a week and for 3 weeks. Short and long term benefits were measured according to 6MWT and 1RM leg press test. Cardiac frequency (F) and arterial pressure (AP) were registered each 5 minutes during periods 1, 7 and 15.
F and AP did not show any significant fluctuations from beginning to end of the ESM period, and there is no difference between periods 1 and 15. 6MWT showed a mild but statistically significant improvement (232 to 244 m, p = 0,02). The 1RM leg press was also improved (192 to 209 p, p=0,004). After, 3/9 patients were able to complete a PR program. At one year, 6MWT and 1RM leg press test were below the baseline values. ESM was well tolerated by the patients, without complication.
Conclusion: Home-based ESM program is a safe procedure and is not associated with significant change in F and AP, and an immediate impact was observed on 6MWT and 1RM leg press test. It could precede a complete PR program in selected severe to very severe COPD patients and be offered in a context of hospitalization.

P4809
The effect of BiPAP on maximum exercise capacity in patients with COPD
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Background: Noninvasive ventilation has been used as an adjunct to exercise. The aim of this study was to evaluate the effect of BiPAP (Vision, Respironics; no Plateau Exhalation Valve), compared to no assist, on maximum exercise capacity in individuals with COPD.
Methods: A randomized crossover design was used. Ten stable COPD patients (FEV_1 53±21% pred) performed three symptom-limited incremental exercise tests on a bicycle ergometer while breathing through a mouthpiece, with either no pressure support (PSno), PS of 0 cm H2O (PS0; IPAP & EPAP 4 cm H_2O) or 10 cm H_2O (PS10; IPAP 14 & EPAP 4 cm H_2O) of assist on separate days. Exercise workload (WL), dyspnea and leg effort (Borg), end-expiratory lung volume (EELV), breathing pattern, O_2 uptake (VO_2) and CO_2 production (VCO_2) were measured during exercise.
Results: Peak WL was lower with PS10 (33±16) and PS0 (30.5±13) than PSno (43±19) ($p<0.001$); there was no difference between PS0 and PS10. Dyspnea at peak exercise was similar with PSno, PS0 and PS10; at isoload it was lower with PSno compared to PS10 and PS0 ($p<0.01$). Leg effort at peak exercise was higher with PSno than PS10 and PS0 ($p<0.05$), whereas it was not different at isoload. Tidal volume (VT) and minute ventilation (VE) were highest with PS10 and lowest with PSno both at peak exercise ($p<0.001$) and isoload ($p<0.001$). EELV was similar at peak exercise with all three conditions. VO_2 and VCO_2 were greater with PS10 and PS0 than PSno (both $p<0.001$), both at peak exercise and isoload.
Conclusion: Use of BiPAP during incremental exercise in the absence of a plateau exhalation valve increases VT and VE at the expense of increasing the VO_2 and dyspnea, which in turns reduces peak exercise WL in COPD patients.

P4810
Effect of ADL-training for persons with COPD: A randomized controlled trial
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Background: Due to various degrees of breathlessness, fatigue, coughing and increased sputum production, COPD patients have problems performing activities of daily living (ADL).
Aim: To investigate if COPD patients experienced differences in performance and satisfaction in performing ADL after participating in a 5 hours compared to 1 hour ADL-training during a 4 weeks pulmonary rehabilitation program.
Methods: A prospective, randomized, single blinded, parallel group design. The control group received Glittreklinikken's standard rehabilitation program, which included 1×60 min ADL-training. The experimental group received 4×60 min ADL-training in addition to the standard rehabilitation program. The Canadian Occupational Performance Measure assessed the performance and satisfaction of doing ADL at inclusion (baseline), after four weeks (at discharge) and three months after discharge.
Results: 24 COPD patients (59% women) were included; mean±SD age 69±8 years, FEV1% predicted 43±14%. The median change for performance scores from baseline to four weeks was 3,85 and 1,25 points in the experimental and control groups (p=0,001), and for satisfaction scores 4,70 and 1,85 points in the experimental and control groups (p=0,002). From baseline to three months, performance score changed 1,25 and -0,60 points in the experimental and control (p=0,001), and satisfaction score changed 3,15 and -0,40 points in the experimental and control groups (p<0,001).
Conclusions: The patients with COPD participating in a 5 hours ADL-training program evaluated their performance and satisfaction of doing ADL to be better than those participating in a 1 hour program, both at the time of discharge and three months after discharge.

P4811
Comparison of efficacy of respiratory rehabilitation in patients with COPD and interstitial lung disease
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Objectives: There are few reports describing the efficacy of pulmonary rehabilitation (PR) in patients with interstitial lung disease (ILD). We studied whether PR could improve functional status and dyspnea in a group of patients with ILD in comparison with patients with COPD.
Methods: Seventy three outpatients (mean age 71y, male: female = 57:16, ILD: COPD: others = 22: 36: 15) joined a 12-week PR program including exercise training, physiotherapy and education. Six-minute walking test, lung function test and evaluation of health-related quality of life (St George's Respiratory Questionnaire: SGRQ, Short Form questionnaire: SF-36) were performed before and after the program and retrospectively analyzed.
Results: We found substantial decrease in SGRQ score from 42.1 to 33.9 ($p<0.0409$) in total patients. Patients with ILD responded well to the program with the improvement of 6-minute walking distance (318.4 m to 331.6 m) and Borg score (5.2 to 4.4). There was no difference between the level of improvement in patients with COPD and ILD.
Conclusions: Our results show that PR improves both functional status and dyspnea in patients with ILD to the same extent as with COPD. PR should be considered as a standard of care for ILD patients.

P4812
Pulmonary rehabilitation in patients with interstitial lung disease – An useful therapeutic option?
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Introduction: Pulmonary rehabilitation (PR) is recommended for patients with chronic lung diseases by ATS or ERS independent of underlying disease. Data examining the role of PR in patients with interstitial lung disease (ILD) are limited,

so far only a benefit of PR in patients with COPD is widely accepted. Aim of our study is to evaluate an in-patient PR in view of functional status and quality of life in ILD-patients.
Methods: 402 ILD-patients (IPF n=202, hypersensitivity pneumonitis n=59, sarcoidosis n=50, rheumatic disease n=24, other n=67) with in-patient PR from 1999 to 2010 in a specialised centre were included. Mean duration of PR was 30±1 days. Pulmonary function, blood-gas analysis, 6-minute-walk test (6MWT), dyspnoea rating with visual-analogue-scale (VAS) and health-related quality of life (SF36-questionnaire) were evaluated on admission and discharge of PR-clinic.
Results: 6MWT showed a significant improvement with 46±3m (admission 308±6m, discharge 354±6m, p<0.001). Dyspnoea rating before and after PR was indistinguishable. Lung function testing showed only a marginal improvement (vital capacity +1.3±0.4%, p=0.001). SF-36-questionnaire demonstrated an increase in all eight subscores as well as in physical and mental health summary scores (physical: +1.8±0.5 points, p<0.001; mental: +6.3±0.9 points, p<0.001). Underlying disease did not show any influence on improvement, but patients with signs of pulmonary hypertension had less improvement in 6MWD (36±5m vs. 49±3m, p<0.05).
Conclusion: PR has a positive impact on functional status and quality of life in ILD-patients. Therefore PR should be considered as a standard of care for patients with ILD.

P4813
Stationary bicycle training at home in COPD patient on LTOT. Is it enough to improve quality of life and exercise capacity? A pilot study
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Pulmonary rehabilitation improves quality of life (QoL) and exercise capacity (EC) in COPD patients. LTOT with stationary source may reduce daily activities (DA). Aim of study was to assess if self administered training at home improves QoL, EC and overcomes restriction in DA.
Methods: Consecutive COPD pts qualified for LTOT with oxygen concentrator were assessed and randomly assigned to training (TG) or control (CG) groups. Assessment comprised of: cardiopulmonary exercise test (CPET) on cycle ergometer, 6 minute walk test (6MWT), dyspnoea (MRC scale), lung function tests, QoL (SGRQ), DA measured by actigraphy and questionnaire. Training consisted of 30 min. cycling every day for 3 months. In TG adherence to training and its performance was verified by memory card, pts were regularly visited and load was adjusted to patients ability. CG was monitored by phone and encouraged to sustain physical activity.
Results: We studied 33 pts (18M, 15F), mean age 70±9 yrs, mean FEV_1 0.9±0.4 l (40±13%), mean PaO_2 55±4 mmHg. Of 20 pts allocated to TG, 13 pts completed training program. Adherence was satisfactory, pts trained 73±23% of days. TG showed significant improvement in SGRQ (symptoms) and duration of CPET. There was tendency to improve VO_2max (p=0.054) and total SGRQ score (p=0.07). Better adherence to training correlated with greater improvement in QoL, VO_2max and 6MWT distance. Higher work load reached during training correlated with reduction in MRC scale and improvement in 6MWT distance and VO_2max.
Conclusions: Self cycling at home may improve QoL and EC in COPD patients starting LTOT with stationary source, but has no effect on performance of DA.

P4814
Pilot study of effectiveness of home rehabilitation for homebound patients with severe COPD
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Introduction: While pulmonary rehabilitation is efficacious, available evidence is not generalizable to patients who are homebound with severe impariment.
Objective: To test the effectiveness of home-based rehabilitation for homebound patients with physician-diagnosed COPD and severe functional impairment.
Methods: Homebound patients, defined as not driving independently and requiring taxing effort to leave home, were enrolled from primary care and pulmonary clinics. Patients were randomly assigned to one of two interventions comprised of education and physical therapy emphasizing either aerobic activity (A) or strengthening (S). The interventions were delivered over 8 weeks with up to 20 sessions. Pre- and post-intervention outcome measures were collected at 8 and 16 weeks using the Chronic Respiratory Questionnaire (CRQ) and 2-minute walk distance (2MWD).
Results: Of 41 patients enrolled 24 completed the 8 week intervention period with mean age 74.4 (SD 10.7) years, 45.8% female, FEV1 0.75L [30% predicted]). Baseline 2MWDs (mean, SD) were 56.0m (23.3) and 69.3m (34.0) for groups A and S, respectively. After 16 weeks all CRQ domains improved in both groups with the largest improvements in CRQ-dyspnea (A=1.85 [p=0.02] and S=2.21 [p=0.003]). Overall, the proportion of patients reporting clinically significant improvements in CRQ-dyspnea was 80% in group A and 71% in group S. Moreover, 2MWD increased in Group A but declined in Group S.
Conclusions: These results suggest that among homebound patients with severe COPD 8-weeks of either aerobic or strength training are effective for improving quality of life, but aerobic training may be needed to improve walking distance.