66. Exploring outcome measures in COPD and pulmonary rehabilitation

P545 **LATE-BREAKING ABSTRACT**

Home nutritional rehabilitation improves survival in malnourished patients with chronic respiratory failure: a randomized controlled trial

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Background: Body mass and composition predict survival in chronic respiratory failure (CRF). A 3-month home nutritional rehabilitation, aimed at improving body composition, was conducted in malnourished CRF patients.
Methods: One-hundred twenty-two patients (mean age, 66±10 years; 91 men) were included. PaO_2 was 7.7±1.2 kPa, $PaCO_2$ 5.9±0.9 kPa, FEV_1 31±13% predicted, peak workload 36±13 W, 6-min walking distance 290±130 m, quality of life (CRQ, MRF28) body mass index (BMI) 21.4±3.9 kg/m^2 and fat-free mass index (FFMI) 15.7±2.5 kg/m^2. Sixty-two patients were randomly assigned to home health education (controls) and 60 to rehabilitation combining health education, oral nutritional supplements, exercise sessions and oral testosterone for 90 days.
Results: The 3-month rehabilitation improved BMI (+0.58 [95%CI: 0.19–0.98], p<0.05), FFMI (+0.60 [95%CI: 0.15–1.05], p=0.01), hemoglobin (+9.1 g/L [95%CI: 2.5–15.7], p<0.01), peak workload (+7.2 W [95%CI: 3.7–10.6], p<0.001), quadriceps isometric force (+28.3 N [95%CI: 7.2–49.3], p<0.01), endurance time (+5.9 min [95%CI: 3.1–8.8], p<0.001) and, in women, CRQ (+16.5 units [95%CI: 5.3–27.7], p<0.01). 15-month survival was better in the rehabilitation group (per-protocol analysis, three deaths out of 52 *vs.* 12/62 in controls, p<0.05).
Conclusion: Home intervention aimed at improving body composition significantly increased exercise tolerance, quality of life in women and 15-month survival, supporting its routine incorporation in the treatment of malnourished patients with CRF. Clinical Trials Registration Number: NCT00230984. Funds from PHRC, ANTADIR, AGIRàDom, Danone, Schering-Plough.

P546 **LATE-BREAKING ABSTRACT**

Proactive integrated care improves a constellation of outcomes in COPD

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Introduction: COPD patients often wait to seek medical attention until symptoms require emergency care. We postulated that a proactive integrated care (PIC) program would improve quality of life, increase functional status and reduce healthcare utilization.
Methods: 511 patients with advanced COPD, or a recent exacerbation, were randomized using a rotating daily schedule to receive PIC (n=352) or usual care (UC n=159) over nine months. Prior healthcare utilization was self-reported at baseline and again at study completion. In addition, detailed assessments of patient function, symptoms, quality of life, medications, oxygen usage and smoking status were made at the beginning and end of the study.
Results: The PIC and UC groups were well matched at baseline. Patients were 68 years old with FEV1 = 36% predicted in PIC and 38% in UC. PIC dramatically improved quality of life by 7 or more units in total and in most all subsets as measured by the St. Georges Respiratory Questionnaire (p<0.0001). PIC improved healthcare utilization by lowering COPD-related admissions to the intensive care unit and by decreasing mechanical ventilations (p=0.03). PIC also decreased COPD-related urgent office visits (p<0.0004). Significant improvements were seen in the smoking rate, presence of cough and sputum production, post exercise oxygen saturation, 6MWD, and the BODE index in PIC vs UC (p≤0.03). PIC was also associated with a nearly significant decrease in mortality (p=0.08).
Conclusion: A PIC program aimed at self-management and early intervention for exacerbations substantially improved a variety of key clinical outcomes, suggesting the importance of integrated models of care for chronic disease.

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Clinical characteristics, exercise capacity and inflammatory profile in COPD patients attending to an outpatient pulmonary rehabilitation program (PRP)

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According to International Guidelines (GOLD) for the management of Chronic Obstructive Pulmonary Disease (COPD), a PRP is suggested in addition to pharmacologic therapy for patients with moderate-severe disease. Our aim was to characterize COPD patients that underwent to a 8 weeks oupatient PRP according to following criteria: Pulmonary Function Test (PFT); exercise tolerance by Cardiopulmonary Exercise Test (CPT); systemic inflammatory profile (blood PCR and fibrinogen); exhaled Nitric Oxide (eNO), Malondialdehyde (MDA) in breath condensate, body composition, and comorbidities.
We examined 26 COPD patients with a moderate-severe disease (FEV1: 57.5±18.1%), mild impairment in exercise tolerance (VO2 max:17.3±4.2 ml/kg/min) and mild degree of dyspnoea (1.6±0.6 MRC). Inflammatory markers were: PCR: 10.6±24.3 (VN <-5 mg/dl), fibrinogen: 421.3±66 (NV < 450 mg/DL), eNO: 12.5±10 ppb, MDA in breath condensate: 0.03±0.02 nM. They were in the normal range for body composition and 57.7% of them had comorbidities (in 34.6%, cardiovascular disease). We divided patients in two subgroups on the basis of FEV1 value [moderate (n=14): ≥ 50%; severe (n=12) < 50%]; severe COPD had higher PCR values and fat mass [PCR, mg/dl: 18.5±39.9 severe vs 6.3±6.2 moderate, p=0.02; fat mass%: 35.3±9.7 severe vs 29.3±5.0 moderate, p=0.044]. According to GOLD, many patients attending to an outpatient PRP have a moderate COPD. More severe patients had higher systemic inflammatory markers and higher fat mass.

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Surges in circulating interleukin-6 and transforming growth factor-β associated with exercise in patients with COPD are attenuated by pulmonary rehabilitation

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Pulmonary rehabilitation (PR) is associated with symptomatic and physiologic

improvements in patients with COPD. However, biologic effects on systemic inflammatory and profibrotic cytokines are unproven.
Thirty two patients with moderate or severe COPD (Age 66.1±9.63y, FEV_1 42±17.9% predicted) were recruited to a PR programme. Cardiopulmonary exercise testing was performed before and after the programme. An incremental protocol was used in 16 patients and an endurance protocol in the remaining 16 patients. Serum C-reactive protein (CRP), inflammatory and profibrotic cytokines, oxidative burst and circulating leukocytes and neutrophils were measured before exercise, at peak exercise and at recovery.
There were statistically significant improvements in all domains of the St Georges Respiratory Questionnaire, Chronic Respiratory Disease Questionnaire and Hospital Anxiety and Depression Questionnaire. There were no significant changes in CRP or TNF-α associated with exercise or PR. Exercise was associated with a significant surge in oxidative burst (p=0.0001), circulating leukocytes (p=0.0001) and neutrophils (p=0.0003) and there was a nonsignificant trend towards attenuation of this surge after PR. Endurance exercise was associated with an increase in IL-6 (p=0.0227) that was attenuated by PR (p=0.6271). Incremental exercise was associated with an increase in TGF-β (p=0.0388) that was attenuated by PR (p=0.1441).
Demonstrating biological effects of PR has proved elusive to date. This is the first study to demonstrate modulation of both circulating inflammatory and profibrotic cytokines by PR in patients with COPD.

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Is the EuroQol generic health status questionnaire sensitive to the impact of pulmonary rehabilitation in COPD?

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Introduction: Pulmonary rehabilitation (PR) improves disease specific quality of life (QoL) in chronic lung diseases. A generic tool may help to compare the impact of multiple interventions amongst different groups. We designed a study to compare the outcome of a PR programme on disease-specific and generic health status.
Study design: We compared pre and post PR assessments on consecutive patients in an 8-week hospital based programme. Outcome measures were; Incremental shuttle walk (ISWT), Endurance shuttle walk (ESWT), St George's Respiratory Question (SGRQ) and European Quality of life (EQ).
Results: There were 134 (59 female) patients; *mean (SD);* age 69 (11) yrs; FEV_1 47 (21)% predicted. Two patients died, 37 patients dropped out due to exacerbations. ISWT distance increased from 185 (133) to 226 (142) m, $p<0.001$; ESWT time increased from 5.85 min (3.81) to 10 min (6.55), $p<0.001$; SGRQ total scores reduced from 58 (18) to 55 (20), p=0.004. EQ scores from 0.336 (0.228) to 0.356 (0.189), p=ns & EQ thermometer scores from 55 (18) to 67 (74), p=ns.
EQ health status and SGRQ scores at baseline and after PR showed a correlation, r=-0.51, $p<0.001$. The change in EQ health status (coeff B=0.216,p=0.08) and in ISWT distance was predicted by FEV_1% pred, (coeff B=0.217,p=0.07) but not the difference in ESWT.
Conclusions: Although baseline EQ health status correlated with the SGRQ and both were predicted by baseline lung function; EQ failed to demonstrate the improvement seen in exercise capacity. This may be due to multifocal influence of co-morbidity and other factors on the health status of chronic disease patients. Hence, EQ may not be appropriate for use in cost-effectiveness analysis of PR.

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Functional independence measure as a pulmonary rehabilitation outcome

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Background: In patients with chronic obstructive pulmonary disease (COPD) the progression of disability leads to a reduction in functional independence. The usual panel of outcome measurements of a pulmonary rehabilitation program (PRP) (6' Walking Test – 6'WT, St. George's Respiratory Questionnaire - SGRQ, Medical Research Council dyspnea scale - MRC) could not be suitable to describe changes in functional status and independence induced by PRP.
Aims and Methods: To assess to what extent Functional Independence Measure (FIM) provides an independent quantity in the clinical evaluation of COPD patients, we assessed FIM in 217 COPD patients before and after a four-week inpatient PRP. We also assessed baseline pulmonary function (FEV1 and VC), Body Mass Index (BMI), 6'WT, MRC and SGRQ.
Results: The mean overall initial FIM was 103±22 and increased significantly after PRP (114±15, $p < 0.00001$). By applying Factor Analysis, four factors accounted for 83.5% of the total variance in the data: FEV1 (% predicted value) and VC (% predicted value) loaded on a factor I; FIM and 6'WT loaded on a factor II; SGRQ (total score) and MRC loaded on a factor III; and BMI loaded on a factor IV.
Conclusions: FIM appeared as a useful tool in the assessment of effectiveness of inpatient PRP in COPD patients.

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Daily physical activity in chronic obstructive pulmonary disease

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Introduction: exercice capacity is predictive of survival in COPD patients but still remains difficult to assess from the daily life of the patients. Parameters from new devices allow the assessments of daily activity.
Methods: exercice capacity and physical activity during 5 days were recorded in 26 COPD patients (age: 65±9, FEV1: 48±19%). Daily activity level (in METs) was compared with 22 control subjects. Correlations were made between the BODE index, the 6-min walk distance (6MWD), the St Georges Respiratory Questionnaire (SGRQ) and parameters derived from the multisensor armband (Sensewear Pro Armband).
Results: daily activity evaluated by the number of steps per day, the ratio of total energy expenditure to resting metabolic rate (RMR), and the ratio of active energy expenditure to RMR were significantly lower in COPD patients (4529±2998 vs 11561±3772, 1.48±0.23 vs 1.80±0.31, 0.30±0.23 vs 0.72±0.35). Time spent in sedentary activities was higher, and in at least moderate activities was lower in COPD patients. The best correlations were found between pedometry and 6MWD ($r=0.67$, $p<0.0002$), mean daily METs and D6M ($r=0.62$, $p<0.005$), active energy expenditure to RMR and D6M ($r=0.62$, $p<0.005$), pedometry and BODE index ($r=0.58$, $p<0.002$). No correlation was found between the total score and subscores of the SGRQ and any of the physical parameters.
Conclusion: daily physical activity is decreased in COPD patients. Pedometry and daily active energy expenditure (time >3 METs) are best correlated with the 6MWD and BODE index. They could represent useful field prognosis parameters closely linked to the real life.

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Energy expenditure in COPD patients: estimating the impact of bronchodilators using SenseWear armband

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25 consecutive severe to very-severe COPD patients performed four 6-minute walking test (6-MWT) in 2 different days before and 2, 4 and 6 h after the inhalation of formoterol (F) 12 μg or tiotropium (T) 18 μg, respectively. Physical activity during each 6-MWT was assessed by the SenseWear Armband. At each time also spirometry was performed. Both F and T induced a significant and sustained bronchodilation (FEV_1: after F +0.24L at 2 h, 0.21L at 4 h, 0.20L at 6 h; after T: 0.13L at 2 h, 0.14L at 4 h, 0.11L at 6 h) and influenced hyperinflation (RV: after F -0.49L at 2 h, -0.41L at 4 h, -0.48L at 6 h; after T -0.35L at 2 h, -0.37L at 4 h, -0.33L at 6 h). F significantly increased distance walked in 6 min at 2 h (+25.8 m) whereas T significantly increased it at 2 h (+18,8 m) and at 6 h (+18.4 m). Increase in steps was not significant with F (+24.1 at 4 h), whereas it was significant with T (+24.5 at 6 h). Calories increased after F (+1.1KCal at 2 h) and decreased after T (1.4KCal at 4 and 6 h) always in a non significant manner. Also metabolic equivalents (METs) increased after F (+0.18 at 2 h) and decreased after T (0.19 at 4 h) in a non significant manner. We did not find any significant correlation between the changes in lung function and those of parameters recorded with SenseWear Armband. Our study seems to indicate that the acute changes in lung function induced by bronchodilators do not influence energy expenditure in COPD patients although there is a trend for F to increase and for T to decrease it. It must also be mentioned that F is able to increase distance walked in 6 min and T to increase the number of steps always reduced in severe COPD.

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Profile of physical activities in daily life in Brazilian patients with COPD

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Objectives. To evaluate the characteristics of physical activities in daily life in Brazilian patients with Chronic Obstructive Pulmonary Disease (COPD) and the relationship of these characteristics with different physiologic variables.
Methods. Forty Brazilian COPD patients (18 men; 66±8 years; FEV_1 46±16%pred; BMI 27±6 $kg.m^{-2}$) and 30 healthy age- and sex-matched subjects performed assessment of physical activities in daily life with an accelerometer-based activity monitor (Dynaport® Activity Monitor, The Netherlands) for 12 h/day in 2 weekdays. Other measurements included maximal and functional exercise capacity (incremental exercise test and six-minute walk test [6MWT], respectively), maximal inspiratory and expiratory pressure, peripheral muscle force (1-repetition maximum and handgrip force), quality of life (Saint George Respi-

ratory Questionnaire, SGRQ), functional status (London Chest Activity of Daily Living questionnaire) and dyspnea sensation (Medical Research Council scale, MRC).
Results. COPD patients had lower walking time in comparison to healthy elderly (55±33 *vs* 80±28 min/day; p=0.001) and reduced movement intensity (1.9±0.4 *vs* 2.3±0.6 m/s^2; p=0.004). In addition, COPD patients tended to have more sitting time (294±114 *vs* 246±122 min/day; p=0.08). Walking time in daily life was correlated with 6MWT (r=0.42; p=0.007), maximal workload (r=0.41; p=0.009) and age, MRC scale and SGRQ activity domain (-0.31< r <-0.43; all p≤0.05).
Conclusion. Despite being more active than previous reports of European COPD cohorts, Brazilian patients with COPD are less active in comparison to healthy elderly. Walking time in daily life is only moderately related with maximal and functional exercise capacity.

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Pilot study to assess the discriminatory properties and reproducibility of the actitrac monitors
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Introduction: Objective monitoring of activity in COPD is of interest. We tested the ActiTrac accelerometers (IM Systems,USA) which are easy to use and inexpensive.
Aims: To assess:
1. Test re-test reproducibility of a monitor over 5 tests at a given speed
2. Between monitor reproducibility at a given speed
3. Whether individual monitors could discriminate between walking speeds
Methods: 5 monitors were attached to the waist of a healthy subject who performed 5, 20 minute walks at 3 speeds (1.78, 3.6, 5.54km/hr) in 5 minute sections. Average activity counts (acceleration/min) were analysed.
Results: Table 1 shows descriptive statistics and within-monitor variation over the 5 tests. Monitor1 had the worst reproducibility. There were no significant differences between monitors 2-5 at each speed. All monitors could distinguish between the 3 speeds (all p≤0.01).

Table 1. Average activity counts

Monitor	Speed	Median(IQR)	CV
1	1.78	39.0(21.0)	29.5
1	3.6	88.0 (30.0)	17.4
1	5.54	121.0(38.0)	15.7
2	1.78	24.0(5.0)	9.8
2	3.6	47.0(3.0)	3.3
2	5.54	96.0(8.0)	4.3
3	1.78	29.0(4.0)	8.6
3	3.6	56.0(5.0)	5.2
3	5.54	79.0(21.0)	14.3
4	1.78	24.0(2.0)	3.3
4	3.6	60.0(5.0)	4.8
4	5.54	95.0(21.0)	12.8
5	1.78	24.0(5.0)	12.0
5	3.6	60.0(8.0)	6.4
5	5.54	105.0(22.0)	11.5

CV= coefficient of variation

Conclusion: ActiTrac monitors are reproducible in the same wearer, on repeat tests. With the exception of monitor 1, there were no significant differences in the activity recorded. All monitors could distinguish between different walking speeds.

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Upper limb muscle strength relates with pulmonary functions, exercise capacity, quality of life and dyspnea in patients with COPD
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Aim: Peripheral muscle dysfunction secondary to COPD as a systemic disease is generally accepted. Though the attention is forwarded to the exercise training of lower limbs, as it known that many daily living activities correlated with upper limbs. Limitations in these activities were shown in COPD patients. 1 Max repetation and handgrip tests are used to evaluate the muscle strengths of upper limbs. We aimed to evaluate the relationship of upper extremity strength with pulmonary functions, exercise capacity, quality of life and dyspnea sensation in patients with COPD.
Method: 91 stable patients admitted to our out patient pulmonary rehabilitation unit included. Pulmonary functions evaluated with spyrometry, 1 max repetation and handgrip tests were used for upper extremity strength, SGRQ for health related quality of life. Exercise capacity evaluated with Shutlle Walking and Endurance Shutlle walking tests. Dyspnea sensation was evaluated with MRC.
Results: There were positive correlations with 1max repetation and SWT, endurance time and FVC, where MRC and SGRQ scores revealed a negative correlation. Handgrip results also revealed the same correlations
Conclusion: It was shown that upper extremity muscle strength correlated well with the pulmonary functions, exercise capacity, dyspnea and health releated quality of life. So upper extremity muscle training should be included in peripheral muscle training.

P556
Limited clinical relevance of the 6mwd in relation to complaints and quality of life in COPD
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Background: The 6-minute walking distance (6MWD) is often used to measure exercise capacity in patients with COPD. However, its relationship with non-physiological aspects of Health Status, eg. complaints and Quality of Life, is unclear.
Objective: In this study we examined the relationship between the 6MWD and four domains of Health Status in patients with COPD.
Method: 131 patients with COPD (FEV_1% pred 42.3% ± 18.9) who attended an inpatient pulmonary rehabilitation program were included. Pre-treatment these patients filled in questionnaires and performed tests to measure four domains of Health Status: Physiological Functioning, Complaints, Functional Impairment (including an accelerometer), Quality of Life, and the 6MWD.
Results: Mean walking distance was 356.2 m ± 90.7 (CI 95% 339.4-372.9).

Correlations between 6MWD and sub-domains of Health Status

Domain	Sub-domain*	r
Physiological Functioning	Exercise Capacity	-0.38 °
	Obstruction	n.s.
	Static Lung Volumes	n.s.
	Muscle Strength	n.s.
	Body Composition	n.s.
Complaints	Subjective Complaints	n.s.
	Dyspnea Emotions	n.s.
	Fatigue	n.s.
Functional Impairment	Behavioral Impairment	-0.33 °
	Subjective Impairment	-0.24 °
	Actual Physical Activity (accelerometer)	-0.32 °
Quality of Life	General QoL	n.s.
	HRQol	n.s.
	Satisfaction Relations	n.s.

° p<0.01 *for all sub-domains: the higher the score, the more problematic

Conclusion: The 6MWD is related to exercise capacity and the sub-domains of Functional Impairment (subjective impairment, behavioral impairment, and actual physical activity), but not to other physiological parameters, Complaints, and Quality of Life.

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Characteristics of COPD patients with and without quadriceps weakness
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Quadriceps weakness is of particular interest as it contributes to poor exercise performance in COPD. We aimed to compare clinical outcomes for 483 COPD patients entering pulmonary rehabilitation (PR) (60% men, age 63±10 yrs, BMI 24.3±4.4 kg/m^2, FEV_1 44±17% pred) after stratification for the degree of quadriceps weakness.
Isokinetic peak torque (PT) was measured using a Biodex. The degree of quadriceps weakness was defined as: normal (PT ≥85% pred), mild (70≤PT<85% pred), moderate (55≤PT<70% pred) or severe (PT <55% pred). In addition, legs lean muscle mass (LLMM, using DEXA), 6-min walk distance (6MWD) and Wmax were determined.

	Severe	Moderate	Mild	No
n	203	147	96	37
men (%)	60	60	60	65
BMI (kg/m^2)	22.9 (4.4)	24.3 (4.2)*	26.1 (3.8)*#	27.6 (2.9)*#
Age (yrs)	64.3 (10.0)	61.4 (8.7)*	61.0 (9.2)*	62.1 (10.8)
FEV1 (%pred)	39.8 (16.6)	43.8 (14.7)*	46.9 (15.4)*	55.8 (18.5)*#+
LLMM (kg)	13.0 (6.1)	14.3 (2.7)*	15.4 (2.7)*	16.2 (2.9)*#
6 MWD (%pred)	61.6 (18.1)	72.4 (14.5)*	75.9 (13.0)*	79.1 (15.4)*#
Wmax (%pred)	48.0 (25.7)	55.7 (22.5)*	63.4 (18.6)*#	72.5 (26.2)*#+
Maintenance oral steroids (%)	19.7	15.0	12.5	10.8

P<0,05: *vs severe; #vs moderate; +vs mild

Patients with severe quadriceps weakness were older, had a worse LLMM, a worse FEV_1 and clear exercise intolerance compared to patients with moderate, mild or no quadriceps weakness. The proportion of patients with maintenance treatment of oral steroids were not different between strata.
92% of the patients entering PR have mild to severe quadriceps weakness. The weakest patients have worst exercise capacity, but patients with normal strength can still suffer from mild to moderate exercise intolerance.

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The relationship of anxiety and depression with pulmonary function tests, dyspnea, exercise capacity and quality of life in patients with COPD
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Introduction: Anxiety and depression are common in chronic obstructive pulmonary disease (COPD). Dyspnea, impairment of pulmonary function tests (PFTs), exercise tolerance and quality of life are the outcomes of the disease.
Aim: To assess the relationship of anxiety and depression with dyspnea, FEV_1 (forced expiratory volume in one second), exercise capasity and quality of life in patients with COPD.
Methods: We evaluated 55 patients with COPD who participated in our outpatient comprehensive PR program during 8 weeks. Exercise capacity was evaluated by shuttle walking (SWT) and endurance shuttlle walking tests (ESWT). MRC (Medical Research Council) scale was used to estimate dyspnea and SGRQ (St George's Respiratory Questionnaire) for health related quality of life.
Results: The mean age of the patients was 63.04±8.71 years. Anxiety and depression were positevely correlated with SGRQ total, symptom, activity and impact scores. Anxiety was also correlated with MRC scale whereas depression was not. Depression was inversely correlated with the distance walked in shuttle walking test, but there were no corelation with $FEV_{1\%\ predicted}$ and endurance time. Also anxiety had no correlation with $FEV_{1\%\ predicted}$, SWT and ESWT.
Conclusion: The present study showed that anxiety and depression effects dyspnea sensation, exercise capasity and quality of life in patients with COPD. Therefore, all patients attended to PR should be evaluated for psychological impairment.

P559
Realationship of nutritional state with exercise capacity, quality of life and dyspnea in COPD patients
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Introduction: Malnutrition effects exercise capacity, respiratory workload, morbidity and mortality negatively in patients with COPD. Subjective Global Evaluation (SGE) is one of the methods using for evalutaion of nutritonal status in COPD.
Aim: To evaluate realationship of nutritional state with exercise capacity, quality of life and dyspnea in COPD patients.
Method: 100 (Male/Female:86/14) COPD patients admitted to our center were included and evaluated with SGE. Patients were divided into two groups according to SGE survey (SGE-A=Group I and SGE B+C=Group II). Exercise capacity evaluated with Shutlle walking and Endurance Shutlle walking tests where MRC was used for dyspnea sensation, and SGRQ for health related quality of life.
Results: The patients mean age was 64.1±8.7 years and mean FEV1 was 35.6±18.5%. Their mean smoking history was 44.5±34.4 pocket year. Acording to SGE, 67% patients nutritional state accepted as good, 28% mild to modarate and 5% severe malnutrition. There was a significant relation between the SGE and MRC scores ($r = 0.363$, $P < 0.005$). Group II had higher MRC scores than group I. Though the exercise capacity of Group II patients were lower than Group I patients, but it was not significant stastistically.
Conclusion: SGE should be used to evaluate the nutritional status in comprehensive pulmonary rehabilition programs. Larger study populations are needed for evaluating the relations with exercise capasity.

P560
Level of hopelessness in patients with pulmonary diseases
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Aim. Investigating the level of overcoming the feeling of hopelessness and it's interconnection with psychological conditions such as depression and anxiety in pulmologically diagnosed patients.
Study design. 110 patients with different pulmonary diseases. The level of hopelessness has been indentified by the method of individual tests in combination with the Aron Beck's scale of hopelessness, a questionnaire SAS by Zung and Zung's depression scale and additional data taken in the course of an interview.
Results. The results that have been processed by the statistical programme SPSS10 showed that in pulmologically diagnosed patients the level of hopelessness depends apart on the diagnose also on the personal experience of the individual with undergoing diseases and staying at hospital. The lung cancer diagnosed as well as the first-time-at-hospital patients irrespective of the diagnose show a higher level of hopelessness. There is a positive co-relation between the hopelessness scale, depression and anxiety (Table 1).

Table 1. Correlation between level of hopelessness, sex, diagnose, age, years of illness, anxiety and depression

	Sex	Years of illness	Diagnose	Anxiety	Depression	Age	Level of hopelessness
Level of hopelessness			-0,21*	0,48**	0,62**	0,48**	
Anxiety	-0,26**		-0,19*		0,77**	0,43**	0,48**
Depression	-0,23*	0,21*	-0,20*	0,77**		0,74**	0,62**

Conclusion: The results of the study convince us that the hopelessness scale can be used as a screening for diagnosis of depression and pessimism and could be as well a prepecquisit for lending psychological help.

P561
Correlation of oxygen consumption and questionnaire dyspnea and pulmonary functional status in patients with chronic obstructive pulmonary disease
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Patients with COPD is important to calculate the oxygen consumption to determine their functional status, which is performed with cardiopulmonary stress test with expensive and sophisticated equipment.
Establish the degree of association between the domains of the questionnaire of functional status and dyspnea with pulmonary oxygen consumption obtained by cardiopulmonary stress test
We recruited 16 patients with COPD who had cardiopulmonary stress test between March 2006 and November 2007.
Concomitantly in the self-administered questionnaire dyspnea and pulmonary functional status
We found statistically significant correlation of maximum oxygen consumption with the domain of activity questionnaire dyspnea and pulmonary functional status.

Table 1. Correlation between questionnaire Pulmonary Functional Status and Dyspnea and oxygen consumption

	R	Significance
Activity	-0.748	0.005
Dyspnea	-0.345	0.272
Fatigue	-0.435	0.158

Table 2. Variables included in the equation

Model	B	Standardized B	Significance
Constant	0.922		0.001
Activity		-0.505	0.010
FEV1		0.484	0.009
Genero		-0.376	0.032

*Significance of model F 15.494 $p<0.001$. $VO2 = 0.922 - 0.505(\text{Activity}) + 0.0.484(\text{FEV1}) - 0.376(\text{Genero})$

Weight of only one domain of the questionnaires was a good correlation with oxygen consumption, it might be useful to infer the oxygen consumption in cases that can not perform cardiopulmonary stress test.

P562
Depression signs in COPD patients and the relation between the respiratory parameters
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Background: Finding out if there are depressions signs in COPD patients and a relation between the depression score and respiratory parameters such as FEV1,6MWT,PO2,PCO2.
Methods: COPD patients in our clinic and who were applied to our outpatient clinic were enrolled.The patients were staged according to GOLD guidelines and questioned for demographic properties,history of the disease.Pulmoner function tests,arterial blood gas analyses,6MWT,BORG score and BECK depression scale was noted.Patients who marked over 17 points in depression scale are defined as ones,may have a risk of showing depression signs.
Results: 22 inpatients in group1 and 18 outpatients in group2 (31male,9female) as a total of 40 patients were included.Mean age of the patients was 59,42±9,36. Frequency of showing depression signs:57,5%.However there was no significant

difference between the groups about showing the depression signs (p=0,07), depression score was found higher in stage3-4 of COPD patients.Three of the patients in stage 1-2 (9.37%),14 of the patients in stage 3-4 (43.75%) showed depression signs.There was no significant relation between depression score and FEV1,PO2,PCO2 (p>0,05).When having a risk of depression signs and 6MWT distance is compared, walking distance is found significantly low in a depression risky group (p=0,02).
Conclusion: Decreased 6MWT distance in ones who a risk of depression signs was thought as it may be related to patients included in our study are mostly having stage 3-4 COPD.Because of not finding out the relation between depression and other respiratory parameters however it seems not to affect the clinical prognose of COPD,it should have been investigated with the patients higher in number.

P563
Associations between generic and disease-specific health status measures and severity of COPD
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COPD is a progressive disease that worsens health related quality of life (QoL). Disease-specific QoL deteriorates with increasing severity of COPD. Generic QoL can be compared across chronic diseases and can be used to evaluate cost-effectiveness, so we questioned whether a similar relationship exists between COPD severity and generic health status measures.
Methods: Patients being assessed for pulmonary rehabilitation completed the disease-specific SGRQ and two generic instruments - Short-Form-36 (SF36) and Assessment of Quality of Life (AQoL). Severity of COPD was taken from the BODE, which comprises modified MRC Score (mMRC), FEV1% predicted, 6-minute walk (6MWD), and BMI. We usedPearson correlations to examine strength of associations among AQoL, SGRQ, and SF-36 scores; relationships between BODE and each of AQoL, SF36 and SGRQ were tested with linear regression, with age and gender as covariates.
Results: A consecutive convenience sample of 89 COPD patients (mean age 71 years) was evaluated. Mean (*SD*) of BODE components were: FEV1=60.6% (*26.6*); BMI=26.4 (*5.4*); mMRC=2.25 (*1.2*); 6MWD=379 metres (*123*). AQoL correlated with SF36 ($r=0.70$; $p<0.01$) and SGRQ ($r=-0.58$; $p<0.01$). SF36 was more closely associated with SGRQ than was AQoL ($r=-0.73$; $p<0.01$). Variance in BODE was better explained by SGRQ ($R^2=0.29$; $beta+0.51$, $p=0.001$) than by generic HRQoL tools ($R^2=0.13$; $beta=-0.32$; $p=0.005$).
Conclusion: In a typical COPD population disease-specific and generic QoL were inter-related, but SGRQ was more predictive of COPD severity than were generic health status tools.

P564
The correlation between bone mineral density and the respiratory function and the health-related quality of life of patients with COPD
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Background: It has recently been reported that COPD causes osteoporosis as well through its systemic effects in addition to body weight loss ascribable to cachexia and skeletal muscle mass reduction due to exercise limitation.
Purpose: It investigates correlation between bone mineral density (BMD) and respiratory function, the health-related quality of life (HRQOL) of patients with COPD
Subjects and methods: Subjects were 60 patients with COPD in our hospital in 2008. The mean age was 73.6 years, while17 patients were in stage II, 21 in stage III, and 22 in stage IV. We measured BMI, respiratory function, SGRQ, and BMD as measured at the lumbar spine and femur by the DEXA method using QDR-2000, Hologic) on these patients in stable condition.
Results: We obtained the mean values as follows: 21.8 for BMI; 1.09L for FEV_1; 41.6% for predicted FEV_1%; 1.98L for maximum inspiratory capacity (IC); 43.5 for total SGRQ; and 0.697 for BMD and -1.96 for T-score as to the proximal femur, 0.88 for BMD and -1.41 for T-score as to the lumbar spine. BMD was normal in 18, osteopenic in 27, and osteoporotic in 15 patients. 10 patients had complications of compression fractures of the lumbar spine or lumbar spine deformities. BMI showed a significant positive relationship with BMD ($P < 0.01$). Both IC and SGRQ had also significant correlations with BMD ($P < 0.05$).
Discussion: The BMD of COPD patients was decreased. As one of the systemically influences of COPD, It was suggested that BMD was closely related to respiratory function and HRQOL.