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### 396. What do individuals know about their disease? Educational needs, the psychological impact of chronic respiratory disease and health-related quality of life

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**P3620****Late-breaking abstract: Older COPD patients' requirements for eMonitoring and eCoaching: A user-centered study**

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**Introduction:** COPD patients can have increased independence, when adequately supported by appropriate technology, with eHealth opening new opportunities for self-management at home.

**Aims:** The aims were to explore the requirements of older COPD patients, for an effective eHealth home care system, and through this to promote self-management, reduce health care use and increase quality of life.

**Methods:** A qualitative user-centred design, combining focus groups with a scenario-based approach, was used to elicit key criteria for the home care system. Data were collected in two workshops involving patients aged 63 to 83 (n=17). Most had moderate COPD (GOLD II-III- IV); all experienced dyspnoea and restrictions in their activities of daily living.

**Results:** Participants have the prerequisites for a (mobile) eHealth system and in general know how to use this technology. Most (15) use internet and e-mail and all use mobile phones. Participants provided specific needs, wishes and preconditions for eHealth, in physical, cognitive/emotional and social areas; reporting daily activities and problems in which they could use the help. They underlined the importance of technology stimulating patients to maintain and extend their existing abilities.

**Conclusions:** The user-centred design approach enabled patients to identify for themselves, their key requirements for an eHealth system. They wanted support for self-management, to increase confidence in their own abilities and their sense of security. The integration of eMonitoring and eCoaching can support patients to maintain and improve their independence and quality of life at home. An "eCOPD" system is being designed based on the outcomes from this study.

**P3621****Assessing the educational component of pulmonary rehabilitation with the lung information needs questionnaire (LINQ)**

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**Introduction:** Educational sessions are an integral part of pulmonary rehabilitation (PR) programs but there are few tools to assess their impact. The Lung Information Needs Questionnaire (LINQ) is patient reported and designed to assess the information needed to understand lung diseases and to maximise self-management skills (Hyland et al 2006). A decreased score indicates less information requirements. We hypothesised that the LINQ is sensitive to change after a PR program and provides additional information to tests of exercise capacity and health status.

**Method:** We prospectively measured the LINQ, the self-report Chronic Respiratory Disease Questionnaire (CRDQ-SR), Hospital Anxiety & Depression score (HAD) and incremental shuttle walk (ISW) in 217 patients before and after an 8-week outpatient PR program. 11 patients, who declined the outpatient PR pro-

gram and were prescribed a home exercise program (HE), acted as controls. Mean LINQ pre- and post- PR was compared with paired t-test, and unpaired t-test was used to compare mean LINQ changes following PR and HE. Pearson's correlation was used to examine relationship between changes in LINQ and other outcome measures.

**Results:** All 217 patients completed LINQ pre- and post-PR. Mean LINQ fell significantly after PR (95% CI -3.8 to -4.9;  $p < 0.0001$ ). LINQ improvement was significantly greater after PR compared with HE (95% CI -1.1 to -5.8;  $p = 0.004$ ). No significant correlation existed between LINQ change and changes in CRDQ-SR, HAD or ISW.

**Conclusion:** The LINQ is sensitive to change after PR, provides additional information to conventional outcome measures and may be useful to assess the educational component of PR programs.

**P3622**

**Education and information for patients with bronchiectasis: What do patients want?**

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**Background:** Bronchiectasis is up to three times as common as Cystic Fibrosis (CF), yet is poorly studied with variable service provision. The BTS 2010 guidelines also note lack of trials in bronchiectasis self-management. Patient information is less readily available than in other pulmonary conditions, such as CF, however with persistent symptoms and frequent exacerbations, patients could benefit from improved information and education.

**Aims:** To establish patients' needs and their views on information received about bronchiectasis.

**Methods:** A formal questionnaire was conducted in adult patients with bronchiectasis attending the Freeman Hospital specialist clinic.

**Results:** 107 patients were surveyed with a 79% response rate. Patients reported previously having little information about bronchiectasis, particularly prognosis. 86% reported receiving new information at the specialist clinic, and 99% felt more confident about managing their condition when informed about their treatment. 86% found additional information from physiotherapists at physiotherapy training sessions beneficial. 58% had utilised a clinic helpline for advice; 100% were satisfied with the outcome. Patients wanted more information and education about bronchiectasis.

**Conclusions:** Patients with bronchiectasis want more information about their condition. When better informed they feel more confident about management of their condition, with improved symptom awareness, and increased patient satisfaction. Qualitative work is underway to study patient needs further and develop improved systems and optimal formats for patient education in bronchiectasis. This has potential to improve use of resources, self management and patient outcomes.

**P3623**

**Knowledge deficits in COPD patients entering pulmonary rehabilitation**

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Patient education is a core component of comprehensive pulmonary rehabilitation (PR) in patients with COPD (Nici et al. AJRCCM 2006). Indeed, an individualized educational program should be based on addressing disease-related knowledge deficits of COPD patients. To date, limited data are available on these deficits in COPD patients entering PR. Therefore, we aimed to evaluate disease-related knowledge of COPD patients entering PR.

**Methods:** 311 patients with COPD (172 male, mean (SD) age 63 (9) yrs, FEV<sub>1</sub> 49 (20)% pred, BMI 26 (6) kg/m<sup>2</sup>) responded to 50 statements about pulmonary and extra-pulmonary features of COPD ("true", "false" or "I do not know").

**Results:** In general, patients had limited knowledge about their disease (table 1). Some examples: 1/3 of the patients did not know what the abbreviation "COPD" stands for; a minority knew the meaning of "an exacerbation"; a majority believed that PR has a positive effect on pulmonary function; 1/3 thought that too much physical exercise could overload the lungs; 1/3 considered swollen ankles and chest pain as typical symptoms of patients with COPD; 1/5 believed that "self-management" means that no doctor should be visited.

Table 1

Statement	Correct answers (%)	Incorrect answers (%)	"I do not know" (%)
Abbreviation of "COPD"	65	2	33
Meaning of exacerbation	26	19	55
Effect of PR on pulmonary function	22	58	20
Influence of physical exercise on the lungs	60	33	7
Typical symptoms of COPD	23	35	42
Meaning of self-management	61	19	20

**Conclusion:** Patients with COPD entering PR have a heterogeneous level of knowledge considering COPD. Therefore, individualized educational programs should be considered to increase patients' knowledge and, in turn, improve self-management.

**P3624**

**Fatigue components in COPD patients and controls using the FACIT-F scale; data from ECLIPSE study**

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**Introduction:** Fatigue is a complex multi-dimensional phenomenon and its dimensionality in COPD and controls has not been adequately investigated. We aimed to examine the dimensions as well as the reliability and validity of the FACIT-F scale.

**Methods:** At baseline, 2107 COPD patients and 576 control subjects with normal lung function from the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE; SCO104960, NCT00292552) completed the Functional Assessment of Chronic Illness Therapy (FACIT) fatigue scale. The FACIT-F was readministered to 1621 patients and 515 controls after 3 years. We used the principal components analysis (PCA) for structurally examining the 13 items FACIT-F.

**Results:** The 13 items were loaded into two and three interpretable dimensions in COPD and controls, respectively. In COPD, FACIT had high internal consistency (Cronbach's  $\alpha = 0.92$ ) and long-term repeatability ( $r = 0.68$ ,  $p < 0.001$ ). In the two factors solution, the two components of fatigue in COPD correlated well with the total score of the scale ( $r = 0.59$  and  $0.99$ ;  $p < 0.001$  for both).

FACIT had significant convergent validity; its scores were associated with BODE, SGRQ and MRC dyspnoea scores ( $r = 0.42$ ,  $0.7$  and  $0.48$ , respectively,  $p < 0.001$  for all). FACIT had good discriminating validity; patients who walked  $< 350$ m in 6 minute walk test as well as depressed patients were significantly more fatigued than those who walked  $\geq 350$ m or who were not depressed ( $p < 0.001$ ).

**Conclusion:** The FACIT-F is a short and easily administered scale with good validity and reliability in COPD. It may be possible to measure different fatigue components with this scale.

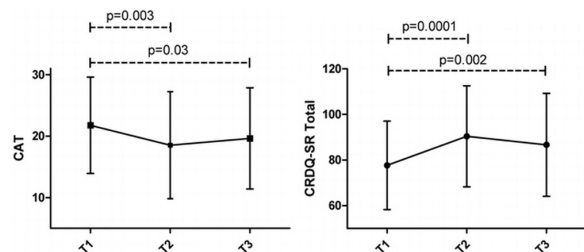
**P3625**

**Long-term changes in the COPD assessment test (CAT) after pulmonary rehabilitation**

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**Introduction:** The COPD assessment test (CAT) is a recently introduced, validated, patient-completed quality of life instrument that is immediately responsive to pulmonary rehabilitation (PR) [1]. The long-term effects of PR on the CAT, and whether these changes relate to more established health status instruments, are not known. We hypothesised that long-term improvements in CAT (reduced score) following PR would correlate with improvements in the self-report Chronic Respiratory Disease Questionnaire (CRDQ-SR) total score (increased score).

**Method:** The CAT and CRDQ-SR were recorded in 39 COPD patients before (T1), immediately after (T2) and 6-months after (T3) an 8 week outpatient PR program. On completion of the PR course, patients were offered individualised exercise advice and goal-setting, but no formal supervised exercise training. Changes in



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CAT and CRDQ-SR were compared from T1 to T2 and from T1 to T3. Spearman's Rank correlation was used to assess the relationship between changes in CAT and CRDQ-SR between T1 and T3.

**Results:** Mean (SD) age was 72 (7) and FEV1%predicted was 47 (19)%. CAT and CRDQ-SR scores at T2 and T3 were significantly improved compared to corresponding scores at T1.

T1-T3 changes in CAT correlated significantly with changes in CRDQ-SR:  $r = -0.40$ ;  $p = 0.01$ .

**Conclusion:** Following PR, short and long-term changes in CAT score mirror the CRDQ-SR.

#### References:

[1] Dodd, JW. *Thorax* 2011, accepted for publication.

#### P3626

##### CAT (COPD assessment test) as outcome parameter of pulmonary rehabilitation (PR) in COPD

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**Background:** The COPD Assessment Test (CAT) is a newly developed questionnaire for COPD-patients. The CAT is designed to measure the impact of COPD on a patient's life, and how this changes over the time. The test contains 8 items.

**Methods:** In a prospective observational study 124 patients with COPD were included, 71.6% male, 45.2% with GOLD Stage 1-2, 26.6% with stage 3, 28.2% with stage 4. Mean FEV1 was 1.66 l. Outcome parameters were 6-MWD, FEV1, MRC-dyspnoea scale and in addition the CAT was used for the first time in Germany as an outcome parameter in PR.

**Results:** Mean CAT score at admission (T0) was  $21.97 \pm 6.49$  and at discharge from PR (T1)  $18.94 \pm 7.56$  ( $p < 0.0001$ ). CAT scores from 21-30 indicate a high impact of COPD on patient's life, as shown at admission. At discharge the average CAT score turned out a medium impact, as a defined range from 10-20 points. The minimal clinically important difference (MCID) for CAT is supposed to be a change of 2 points. In 56.6% of the patients the CAT score decreased for at least 2 points and therefore MCID was achieved. The average improvement was a reduction of 3.03 points. Improvement occurred in all items of the CAT, but the item with the highest impact was breathlessness on effort.

**Conclusions:** In this prospective observational study all COPD-patients were included, regardless of comorbidity or exacerbations. In spite of these circumstances there was a statistically significant and clinically relevant improvement. More than 50% of the patients improved the CAT score for at least 2 points (MCID). The test was answered by our patients without relevant problems and so, since July 2010, the CAT is used as a routine outcome parameter in our PR program.

#### P3627

##### Changes in the CRQ, CAT and updated BODE index by pulmonary rehabilitation

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**Background:** It is unclear to which extend a standardised in-hospital rehabilitation program may change the new COPD assessment test (CAT) score and the updated BODE Index in severe and very-severe COPD patients.

**Method:** In a prospective study we assessed the CRQ, CAT and updated BODE scores in severe and very-severe COPD patients before and after attending a multidisciplinary in-hospital pulmonary rehabilitation program of a approximately 3 week's duration. The assessment comprised in addition sociodemographic and health data.

According to the initial BODE Index and due to statistical reasons we formed two BODE severity groups; group one with 0-7 points and group two with 8-15 points.

**Results:** 315 patients attending a pulmonary rehabilitation program were assessed between first of July and end of December 2010. Thereof 132 patients presented with severe or very-severe COPD. The mean age was 69.2 years, exactly one third female, mean duration of stay 19.7 days.

I. Both groups showed a significant improvement for all four CRQ domains. Only for the domain dyspnea the improvement was significant smaller for patients with a higher BODE score (second group).

II. The CAT score showed a similar significant improvement in both groups (reduction of 4.5 and 5 points respectively)

III. Also the updated BODE Index showed a significant reduction in both groups, however, this reduction was significant less for the second group.

**Conclusion:** The CAT and the updated Bode Index might both provide a valid assessment for changes in an inpatient pulmonary rehabilitation program for severe and very-severe COPD patients.

#### P3628

##### Determinants of health-related quality of life in patients with severe COPD

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**Introduction:** Clinical presentation of COPD patients is very heterogenous. Patients with a comparable degree of airflow limitation present with a wide range in health-related quality of life (HRQOL). This study investigates determinants of HRQOL in severe COPD patients.

**Methods:** Assessment data were extracted from the records of 1562 COPD patients referred for pulmonary rehabilitation. HRQOL was assessed by St. George's Respiratory Questionnaire (SGRQ). Data were divided into quadrants of FEV1 and total SGRQ score.

**Results:** Compared to patients with FEV1 < 50% and SGRQ ≥ 50, those with SGRQ < 50 are characterized by lower BMI, better exercise performance, fewer exacerbations in last year, lower depression (HADS\_D) and anxiety (HADS\_A) scores and less dyspnea (MRC). In stepwise multiple regression analysis, MRC, HADS\_A and HADS\_D, 6MWD and number of exacerbations in last year were independent predictors for HRQOL.

Differences in clinical parameters between quadrants of FEV1 and SGRQ

	(1) FEV1 < 50% SGRQ ≥ 50	(2) FEV1 ≥ 50% SGRQ ≥ 50	(3) FEV1 < 50% SGRQ < 50	(4) FEV1 ≥ 50% SGRQ < 50
N	756	251	282	273
Age, y	64±9	64±10	64±10	64±9
FEV1, % pred	33±9	66±14*	38±9†	66±12**
BMI, kg/m <sup>2</sup>	25.1±5.2	26.8±5.2*	24.1±4.3*†	25.6±5.1**‡
6MWD, m	370±121	423±116*	459±120*†	517±89**‡
MRC dyspnea	4.1±1.0	3.5±1.1*	2.9±1.1*†	2.4±0.9**‡
SGRQ total, pts	66±9	63±10	37±10*†	35±10**†
HADS_A, pts	8.5±4.5	8.5±4.1	5.3±4.0*†	5.9±3.9*†
HADS_D, pts	8.0±3.9	7.9±3.8	5.1±3.7*†	5.1±3.4*†
Exacerbations, previous year	3±3	2±2*	2±3*	1±2**‡

\* $p < 0.05$  vs 1; † $p < 0.05$  vs 2; ‡ $p < 0.05$  vs 3.

**Discussion:** Clinical, physiological and psychological factors determine HRQOL in severe COPD. These factors must be taken into account in the disease management of these patients.

#### P3629

##### Evaluation of quality of life instruments for COPD care and research

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**Background:** Quality of Life (QOL) measurements to quantify the impact in Chronic Obstructive Pulmonary Disease (COPD) with a standardized method has become important in the last decades. A variety of QOL instruments are available. To facilitate decision making with regard to an appropriate QOL instrument in COPD care and research, a systematic review was performed.

**Objective:** To identify and evaluate content and psychometric properties of currently available QOL instruments in COPD care and research.

**Method:** A systematic literature search was done. Based on criteria, 2 investigators independently identified eligible studies. Methodological quality and data on psychometric properties were assessed by using the Consensus based Standards for selection of health status Measurement Instruments (Mokkink *et al.* J Clin Epidemiol 2010;63:737-45).

**Results:** 56 Studies, 11 disease-specific and 45 generic QOL instruments are identified. Methodological studies' quality is mostly rated fair. In 50 studies theoretically derived hypotheses are not described. In 34 studies confirmatory factor analysis was not performed. Measurement properties are in general positive. Chronic Respiratory Questionnaire has slightly better results than generic measures: hypothesis testing correlation > 0.5, Chronbach's  $\alpha > 0.7$ , Intra Class Correlation (ICC) 0.5-0.9. The new COPD assessment test  $\alpha = 0.88$ , ICC = 0.8. Disease-specific instruments hold domains like dyspnea and activity. Social activity, emotional status, anxiety and pain are mostly included in generic instruments.

**Conclusion:** Since both disease-specific and generic domains are important in measurement of QOL in COPD patients, we recommend to use at least two QOL instruments covering as many domains as possible.

#### P3630

##### Coping style and health status in COPD patients entering pulmonary rehabilitation

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**Background:** Mood status contributes to an impaired health status in patients

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with COPD. Coping style may also be related to health status. Our objective was to assess disease-specific health status in COPD patients entering pulmonary rehabilitation after stratification for coping style and mood status.

**Methods:** Coping styles were studied in 698 COPD patients entering PR (60% men; mean (SD) age: 64 (10) yrs; FEV<sub>1</sub>: 48 (18)% pred.) using the Utrecht Coping List. The current analysis is limited to passive coping style. Disease-specific health status (St. George's Respiratory Questionnaire (SGRQ)), and symptoms of anxiety (HADS-A) and depression (HADS-D) were recorded.

**Results:** Mean (SD) SGRQ total score was 54 (17) pts. Clinically relevant symptoms of anxiety (HADS-A  $\geq 10$  pts) and depression (HADS-D  $\geq 10$  pts) were reported by 30% and 23% of the patients, respectively. Low level of passive coping style was reported by 18% of the patients; medium level by 39% and high level by 43% of the patients. In patients with HADS-A or HADS-D  $< 10$  pts, SGRQ total score was higher for patients with a high passive coping style than for patients with a low or medium level passive coping style. In patients with HADS-A or HADS-D  $\geq 10$  pts, differences did not reach statistical significance.

SGRQ total score after stratification for mood status

Passive coping	HADS-A $\geq 10$	HADS-A $< 10$	HADS-D $\geq 10$	HADS-D $< 10$
Low	53 (8)	45*# (15)	52 (5)	45*# (15)
Medium	59 (15)	49# (15)	60 (14)	49# (15)
High	63 (16)	56 (16)	64 (15)	56 (17)

\*p<0.05 vs. medium; #p<0.05 vs. high

**Conclusions:** The level of passive coping style may have a relationship with health status in COPD patients after stratification for symptoms of anxiety and/or depression.

### P3631

#### Relationship between quality of life, exercise capacity and disease severity in patients with chronic obstructive pulmonary disease

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The Chronic Obstructive Pulmonary Disease (COPD) Assessment Test (CAT) is a new, simple questionnaire designed to evaluate quality of life in COPD patients. In contrast to more complex assessment tools (such as St. George's Respiratory Questionnaire), no studies have evaluated its relationship with other disease severity markers in COPD such as walk test.

This study investigated the relationship between CAT score and markers of disease severity in COPD: including forced expiratory volume in 1 second (FEV<sub>1</sub>), endurance shuffle walk test (ESWT) and incremental shuffle walk test (ISWT).

Fifty patients with a known diagnosis of COPD (male: female ratio 22:28, mean age 68.1 $\pm$ 13.3 years, mean FEV<sub>1</sub> 46.9 $\pm$ 20.3% of predicted) were evaluated using spirometry, ESWT and ISWT. Quality of life was assessed using CAT. Mean ISWT was 182 $\pm$ 124 metres and mean ESWT was 6.9 minutes  $\pm$  6 minutes.

CAT score correlated negatively with ESWT (r = -0.40, p<0.01) and ISWT (r = -0.30, p<0.05). There was no significant correlation with FEV<sub>1</sub> in this study population. However, it is very interesting that CAT score is inversely related to exercise capacity. As the disease gets more severe, quality of life worsens (higher score on CAT) and the patient becomes less able to do things (lower ESWT/ISWT). Although this concept is logical, it was not described previously.

Our study showed that CAT represents a useful instrument to evaluate disease impact in COPD, when interpreted alongside complementary diagnostic information. It would be really interesting to see the relationship of CAT and other parameters of lung function, such as transfer factor and lung volume in future studies.

### P3632

#### Quality of life evaluation in patients with alpha1-antitrypsin deficiency: A 3-year prospective study

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**Background:** AATD is associated to pulmonary disease, mainly COPD. In comparison to COPDs without AATD, pts with AATD and COPD present an accelerated decline in respiratory function in conjunction to all the other COPD characteristics: frequent exacerbations, disabling symptoms (dyspnea and phlegm), reduction in exercise capacity and daily life activities. These pts, therefore, frequently have respiratory disability. However, their impairment appears in a relatively younger age in comparison to COPD.

**Aim of the study:** Our aim was to evaluate pts' QoL in relation to the use/not use of augmentation therapy.

**Materials and methods:** We performed a 3 year prospective study in 32 pts (main age 54 $\pm$ 10 yrs; M/F 19/13, FEV<sub>1</sub> 48 $\pm$ 24% predicted). The St George's Respi-

ratory Questionnaire (SGRQ) and the EuroQoL (EQ-5D) were administered at baseline and yearly for three years. According to their spirometric impairment, patients were stratified in Group T, i.e. treated with weekly infusions of AAT (25 pts), and Group NT, i.e. not treated (7 pts).

**Results:** After 3 years, the decrease in FEV<sub>1</sub> in Group T was 125 ml (4%), whereas in Group NT was 610 ml (41%), p<0.02.

SGRQ changes over three years were significantly different in the two groups. Group T showed a 7.8 unit improvement, whereas in Group NT QoL worsened by 7.9 units (p<0.04 over time between groups).

Conversely, the EQ-5D did not detect any change in health status between the two groups or over time.

**Conclusion:** These data show that AATD associated with COPD determines a decrease in patients' health status that may be slowed down by augmentation therapy. The improvement in health status in T Group can be detected by the SGRQ but not the EQ-5D.

### P3633

#### Effect of gender on exercise capacity and hospital anxiety and depression scale (HADS) score following pulmonary rehabilitation

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The objective of this study was to determine whether gender impacts change in outcome following pulmonary rehabilitation (PR). The records of 241 COPD patients who underwent a hospital-based, 8-week outpatient PR programme were reviewed. All patients received upper and lower extremity exercise training and self-managed education. Pre- and post-outcome measurements included 6-minute walk distance (6MWD), self-reported Chronic Respiratory Questionnaire (CRQ-SR), unsupported armlifts/minute (UAL), Hospital Anxiety and Depression scale for anxiety (HADS-A) and depression (HADS-D), before and after PR. Mean age was 69 $\pm$ 9 years; 49% were females; mean FEV<sub>1</sub> was 49% of predicted. Outcomes measures are shown in the following table:

Outcome measures pre- & post-PR

Outcome Measures	Males	Females
Pre-6MWD (meters)	281 $\pm$ 90	239 $\pm$ 86
Post-6MWD (meters)	318 $\pm$ 97	292 $\pm$ 94
Pre-UALs (per min)	47.5 $\pm$ 17	35.5 $\pm$ 12
Post-UALs (per min)	59.8 $\pm$ 18	47 $\pm$ 17
Pre-CRQ (units)	4.2 $\pm$ 0.9	3.9 $\pm$ 0.9
Post-CRQ (units)	4.9 $\pm$ 0.8	4.8 $\pm$ 0.9
Pre-HADS-A	5.3 $\pm$ 3	6.9 $\pm$ 3
Post-HADS-A	4.5 $\pm$ 2.9	5.5 $\pm$ 3
Pre-HADS-D	5.5 $\pm$ 3.6	5.5 $\pm$ 3
Post-HADS-D	4.2 $\pm$ 3	3.5 $\pm$ 2

Patients in both genders showed significant improvement in all outcome measures. Change in UALs were similar in both genders (p=0.8); females showed greater increase in 6MWD (p=0.01) and CRQ-SR score (p=0.07). Pre-PR HADS-A scores were significantly higher in females (p=0.0009). Females showed greater reduction in HADS-D scores following PR (p=0.02). These data indicate that female COPD patients show greater improvement in outcome areas of exercise capacity, depression and quality of life following PR.

### P3634

#### Pulmonary rehabilitation, COPD assessment test and smoking cessation at smokers with COPD

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The objective was to compare the improvement of quality of life (QoL) between smokers with chronic obstructive pulmonary disease (COPD) who completed a PR program complementary of the smoking cessation treatment and those who received usual treatment.

**Methods:** Inclusion criteria were: evidence of COPD according to GOLD standards; an initial HbCO  $> 2\%$  and an initial COPD Assessment Test (CAT) completed by every patient. From 437 smokers with COPD (GOLD stages II-III) only 113 patients were enrolled in a 12 weeks supervised PR program, complementary the smoking cessation treatment (the PR group), and 324 smokers received the treatment for COPD and for stop smoking, monitored as well for 12 weeks (non-PR group). All patients completed the CAT questionnaire at the beginning and at the end of the determined period.

**Results:** Initially, CAT scores varied between 26-38 without any difference between the PR group and the other patients. At the end of the period, the CAT scores in the PR group were between 7-16 comparing to the non-PR group where

CAT scores shown little improvements since the beginning of the treatment, with values between 20-26, additionally to smoking cessation failure at an important number of non-PR members (45.98%) than the PR group (16.81%). There were reported as well higher rates of long-term abstinence in the patients adherent to PR than the other group.

**Conclusions:** Although current smokers are often expected to have a small PR adherence, COPD smokers who completed the PR presented important QoL improvements, better CAT score than COPD smokers usually treated. Moreover, a better PR adherence seems to be related with higher rates of sustained long term abstinence.

### P3635

#### Factors predicting clinically improved health status in COPD patients after pulmonary rehabilitation

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**Background:** Although pulmonary rehabilitation has proven to be effective in enhancing health status (HS) in COPD patients (Lacasse *et al*, Cochrane Database Syst Rev 2006; 4), characteristics of those who have the largest potential for HS improvements after rehabilitation are less studied. This knowledge may be useful for physicians' referral practice.

**Aims:** The aim of the study was to investigate the influence of lung function on a clinical improved health status after rehabilitation adjusted for gender, age, and co-morbidity. Since the association between lung function and health status in COPD patients is usually low (Jones, P.W., Thorax 2001; 56: 880-887), we hypothesized no influence of lung function on the post rehabilitation outcome.

**Methods:** A longitudinal study of 136 consecutive male and female patients attending 4 weeks inpatient rehabilitation, aged 40+ and with COPD I-IV. Lung function was assessed by spirometric tests and health status by the St. George's Respiratory Questionnaire. The influence of independent variables on HS was assessed through logistic regression analyses.

**Results:** Patients with minor disease (FEV<sub>1</sub> ≥ 50% predicted) were more likely to achieve clinically improved health status after rehabilitation than patients with major disease (FEV<sub>1</sub> < 50% predicted) (OR 4.2, 95% CI 1.9-9.3, p=0.001), with stronger effect for female than for male patients (OR 7.1, 95% CI 1.9-39.0, p=0.025).

**Conclusions:** Our findings upgrade the significance of lung function on HS in COPD patients, implicating that referral to pulmonary rehabilitation at an early COPD stage is crucial in order to achieve optimal post rehabilitation effect, especially for female patients.

### P3636

#### Abnormal illness behaviour amongst COPD patients entering pulmonary rehabilitation

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**Introduction:** COPD patients present with a mixture of symptoms, some of which may not always be attributable to physical pathology. The degree of the psychological and behavioural component of illness may at times be out of proportion with objective physical pathology. Maladaptive perceptions associated with abnormal illness behaviour (AIB) may have negative consequences for patients' health outcomes.

**Objectives:** The study aimed to 1) investigate the prevalence and type of AIB present in COPD patients entering pulmonary rehabilitation and 2) evaluate the associations between AIB, quality of life, mental health and level of disability in COPD patients.

**Method:** A cross-sectional study design was employed. Sixty-nine COPD participants entering a pulmonary rehabilitation program completed the Illness Behaviour Questionnaire (IBQ), Hospital Anxiety and Depression Scale (HADS), Short Form 36 (SF-36) and Chronic Respiratory Questionnaire (CRQ).

**Results:** Correlations indicated that AIB was significantly (p<0.01) associated with anxiety, age, dyspnoea and emotional function. Multiple regressions indicated that significant (p<0.01) predictive relationships existed between the Hypochondriasis subscale of the IBQ and anxiety (HADS), dyspnoea (CRQ) and mental disability (SF36).

**Conclusion:** AIB is linked with health outcomes amongst COPD patients. Early recognition of AIB allows for the tailoring of pulmonary rehabilitation programs to address perception of illness issues.

### P3637

#### Anxiety and affecting factors in pulmonary rehabilitation patients with chronic obstructive pulmonary disease during exacerbation

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**Aims:** To investigate the anxiety prevalence and related factors in COPD patients engaged in the rehabilitation program during exacerbation.

**Material and methods:** Hospital Anxiety and Depression Scale (HAD) was performed to 75 COPD patients (mean age 69.6±8.8 years). Mean HAD anxiety score was 6.4±5.2.

**Results:** Patients in both groups had similar age, systemic diseases, social features, disease severity, arterial blood gases, walking distance, heart rate, respiratory rate and saturation during the walk test. However, there were significant differences in some variables between two groups.

Clinical and demographic variables of the COPD patients with HAD anxiety scores <11 and ≥11

Variable	Hospital Anxiety and Depression Scale-Anxiety Score		p
	≥11 (N=17)	<11 (N=58)	
Education years, <8	100%	63%	0.003*
Assistive walking device	41%	14%	0.022*
Dyspnea during bathing (VAS-mm)	58.3±35.0	39.1±31.1	0.034*
Dyspnea during upper dressing (VAS-mm)	41.1±32.0	25.7±24.7	0.04*
LTOT	65%	30%	0.012*
FEV1/FVC	52.6±9.5	55.6±10.8	0.322
6 minute walk test- distance (meter)	182.2±153.8	262.8±116.0	0.066
Stopped test before 6 minutes	75%	27%	0.004*
Dyspnea after walk test (Borg)	5.8±3.2	3.6±2.9	0.036*
Mini-nutritional score	18.4±4.7	22.2±4.4	0.003*

\*p value less than 0.05.

**Conclusion:** Despite similar disease severity and walk tests in both groups, patients with high anxiety scores having higher ratio of the inability to complete walk test, more severe symptoms during the test and ADL made us suggest that anxiety levels restricted their participation in physical activity. We think that appropriate psychiatric approach will increase the rehabilitation gains among patients with high HAD anxiety scores.

### P3638

#### The impact of anxiety and depression on outcomes of pulmonary rehabilitation in COPD

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Anxiety and depression are highly prevalent comorbidities in chronic obstructive pulmonary disease (COPD) and related to a negative course of disease. We examined the impact of anxiety and depression on functional performance, dyspnea and quality of life in patients with COPD at start and end of an intensive 3-week outpatient pulmonary rehabilitation program (PR).

Before and after PR, 238 patients with COPD (mean age = 62 years) underwent a 6-minute walking test (6MWT). In addition, anxiety, depression, quality of life and dyspnea at rest, after 6MWT and during activities were measured before and after PR.

Except for dyspnea at rest, improvements were found for all outcome measures after PR. Multiple regression analyses showed that before and after PR, anxiety and depression were associated with greater dyspnea after 6MWT and during activities and with reduced quality of life, even after controlling for effects of age, sex, lung function and smoking status. Furthermore, before and after PR anxiety was related to greater dyspnea at rest, whereas depression was associated with reduced functional performance in the 6MWT.

The results demonstrate that anxiety and depression are significantly associated with increased dyspnea and reduced functional performance and quality of life in patients with COPD. These negative associations remain stable over the course of PR, even when improvements in most of these outcomes are achieved during PR. The findings underline the clinical importance of diagnosing and treating anxiety and depression in patients with COPD.

### P3639

#### Quality of life (QoL) in asthma 1 year after pulmonary rehabilitation (PR)

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**Background:** There are only sparse data on the effectiveness of PR on QoL in

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asthma. Therefore we conducted a prospective observational study to determine the effect of a 3 week inpatient-PR on QoL.

**Methods:** From May to September 2009 all asthma patients of our pulmonary rehabilitation clinic were asked to participate in the study, 201 out of 242 (83%) agreed. 42.3% female, mean age 48.4 y (18-81), SRaw [kPa\*s]  $1.23 \pm 0.80$  before and  $0.88 \pm 0.54$  after inhalation of a rapid-acting beta-2-agonist (RABA). 59.6% suffered from asthma GINA grade 3-4. Obligate components of PR were patient education, physical training, breathing retraining and psychosocial support. QoL was assessed by using St. George's Respiratory Questionnaire (SGRQ) and Asthma Quality of Life Questionnaire (AQLQ[S]). Measuring times were the beginning of PR (T0), discharge (T1) and 3 (T2), 6 (T3) and 12 months (T4) post PR. The three latter were delivered by mail. 83.5% (T2), 88% (T3) and 72.6% (T4) of the patients answered.

**Results** (mean $\pm$ sd): *sgrq total score*: T0  $38.6 \pm 18.3$ ; T1  $27.8 \pm 17.4^*$ ; T2  $30.9 \pm 20.7^*$ ; T3  $32.5 \pm 20^*$ ; T4  $32.7 \pm 20^*$ . *AQLQ[S] score*: T0  $4.6 \pm 1.2$ ; T1  $5.5 \pm 1.1^*$ ; T2  $5.2 \pm 1.3^*$ ; T3  $5.0 \pm 1.3^*$ ; T4  $5.0 \pm 1.3^*$ . *FEV1 [l] (after RABA)*: T0  $3.13 \pm 0.88$ ; T1  $3.22 \pm 0.89^*$  (\*p<0.01 versus T0).

**Discussion:** The reduction of mean SGRQ score and increasing of mean AQLQ score indicate improvement of QoL after PR. Both indicate a great effect at discharge, which diminishes a little after 1 year. The positive effect at discharge was assured by the lung function measurements. After 1 year still 45% (AQLQ) to 55.8% (SGRQ) of the patients have a selfreported benefit.

**Conclusion:** PR causes a resting improvement of QoL in asthmatics at least for one year.