

## **Is there any evidence that multi disciplinary pulmonary rehabilitation impacts on hospital activity?**

The NICE guideline on Chronic Obstructive Pulmonary Disease states that the ACCP evidence-based guideline highlights that there is currently little information available from RCTs that evaluate the utilisation of healthcare resources for patients completing a comprehensive pulmonary rehabilitation programme. It has been shown in several non randomised and observational studies that there is a trend towards a decrease in the total number of hospital days as well as the total number of hospitalisations required for a patient with COPD following pulmonary rehabilitation. There is conflicting evidence regarding the number of days spent in hospital. Griffiths et al. (n=200) found that the number of days rehabilitation patients compared to control patients spent in hospital differed significantly (mean 10.4 days versus 21.0 days, p=0.022) in favour of the rehabilitation patients. However Ries et al. in a smaller RCT (n=119) found that duration of hospital stay was non significant.<sup>1</sup>

The European Respiratory Society standards for the diagnosis and management of patients with COPD found that there are conflicting reports on the effect of pulmonary rehabilitation on healthcare utilisation. A randomised controlled trial of pulmonary rehabilitation in California failed to show a beneficial effect on hospitalisations on COPD. However a study of outpatient pulmonary rehabilitation in Wales demonstrated that the rehabilitation group has a similar frequency of hospitalisation but a smaller number of hospital days than a control group in the year following the intervention. (10.4 versus 21.0 days).<sup>2</sup>

A 2005 systematic review of 6 RCTS including 230 patients looked at whether respiratory rehabilitation after acute exacerbation improves prognosis and health status compared to usual care. It found that respiratory rehabilitation reduced the risk for hospital admissions (pooled relative risk 0.26 [0.12-0.54]).<sup>3</sup> The mean number of hospital admissions per patient was reduced from 1.6 to 0.9 in the year following a hospital admission due to acute exacerbations.

The 1997 joint ACCP/AACVPR evidence based guidelines found no significant decreases in hospitalisation and duration of in-patient stay were found in controlled studies, with observational studies showing significant results. There were 2 RCTs, one involving 119 patients compared the effect of education alone vs a comprehensive rehabilitation program on various outcomes in patients with COPD. There were slight but not statistically significant differences in the duration of hospital stay between the two groups (group A: +1.3 days per patient per year compared to

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<sup>1</sup> Chronic obstructive pulmonary disease : management of COPD in adults in primary and secondary care, NICE, 2004

<sup>2</sup> [http://www.ersnet.org/lrPresentations/copd/files/main/contenu/pages/full\\_text.pdf](http://www.ersnet.org/lrPresentations/copd/files/main/contenu/pages/full_text.pdf)

<sup>3</sup> Puhan MA, Scharplatz Madlaina, Troosters Thierry & Steurer Johann. Respiratory rehabilitation after acute exacerbation of COPD may reduce risk for readmission and mortality – a systematic review. Respiratory Research, 2005, 6, 1, p54.

group B: -2.4 days per patient per year [p+0.20]) during the year following the rehabilitation programme. The 2<sup>nd</sup> RCT involving 58 patients showed a significant reduction in hospitalisation over 6 months.<sup>4</sup>

A 2003 systematic review looked at the impact of pulmonary rehabilitation on clinical outcomes in patients with COPD. The review found that pulmonary rehabilitation did not have any significant effect on hospitalization rates (RR, 0.99; 95% CI, 0.56-1.75).<sup>5</sup>

There are several randomised controlled trials that have been conducted and summarised in table 1.

STUDY	Patients	Intervention/Follow Up	Outcome
Griffiths-T-L et al. 2000	200 patients with disabling chronic lung disease (the majority with chronic obstructive pulmonary disease)	6-week multidisciplinary rehabilitation programme (18 visits) or standard medical management	There was <b>no difference between the rehabilitation (n=99) and control (n=101) groups in the number of patients admitted to hospital (40 vs 41) but the number of days these patients spent in hospital differed significantly</b> (mean 10.4 (SD 9.7) vs 21.0 (20.7), p=0.022).
Ries-Andrew-L et al. 2003	172 patients with chronic lung disease	Subjects were randomly assigned to a 12-month maintenance intervention with weekly telephone contacts and monthly supervised reinforcement sessions (n = 87) or standard care (n = 85)	Overall health status ratings were better maintained in the experimental group together with <b>a reduction in hospital days</b>

<sup>4</sup> Ries A L, Carlin B W, Carrieri-Kohlman V, Casaburi R, Celli B R, Emery C F, Hodgkin J E, Mahler D A, Make B, Skolnick J. Pulmonary rehabilitation: joint ACCP/AACVPR evidence-based guidelines. Chest. 1997;**112**(5):1363-1396

<http://www.mrw.interscience.wiley.com/cochrane/cldare/articles/DARE-971397/frame.html>

<sup>5</sup> Sin DD, McAlister F A, Man S F, Anthonisen N R. Contemporary management of chronic obstructive pulmonary disease: scientific review. JAMA, 2003, 290, 17, p. 2301-12

		and followed for 24 months.	
Ries-A-L et al. 1995	119 outpatients with chronic obstructive pulmonary disease that was stable while patients received a standard medical regimen	Patients were randomly assigned to either an 8-week comprehensive pulmonary rehabilitation program or to an 8-week education program. Pulmonary rehabilitation consisted of twelve 4-hour sessions that included education, physical and respiratory care instruction, psychosocial support, and supervised exercise training. Monthly reinforcement sessions were held for 1 year. The education group attended four 2-hour sessions that included videotapes, lectures, and discussions but not individual instruction or exercise training.	There were slight but nonsignificant differences in survival (67% compared with 56% (P = 0.32)) <b>and duration of hospital stay (-2.4 days/patient per year compared with +1.3 days/patient per year (P = 0.20)).</b>
Boxall-Anne-Marie et al 2005	60 housebound COPD patients older than 60 years	12-week home-based pulmonary rehabilitation program. Intervention patients received an individually tailored supervised walking and arm exercise program as well as individual multidisciplinary education sessions on COPD and its management	At 6 months, the intervention group had a significantly <b>shorter average length of stay at readmission to hospital</b> with exacerbation (P = .035).
Güell-R et al. 2000	Sixty patients with moderate to	Thirty patients randomized to	The PR group experienced a

	severe COPD (age 65 +/- 7 years; FEV (1) 35 +/- 14%) were recruited	rehabilitation received 3 months of outpatient breathing retraining and chest physiotherapy, 3 months of daily supervised exercise, and 6 months of weekly supervised breathing exercises. Thirty patients randomized to the control group received standard care.	<b>significant (p &lt; 0.0001) reduction in exacerbations, but not the number of hospitalizations</b>
Man-William-D-C et al. 2004	42 patients admitted with an acute exacerbation of COPD	An eight week, pulmonary rehabilitation programme for outpatients, started within 10 days of hospital discharge, or usual care	The rehabilitation group made far fewer visits to accident and emergency departments, and we <b>saw a trend towards reduced hospital readmission rate and fewer hospital days.</b>
Bowen-J-B et al. 1999	38 patients with severe COPD	Short-stay inpatient pulmonary rehabilitation (SSIPR) for 1 year	<b>The number of annual days of acute care hospitalization was reduced from 15.4 pre-SSIPR to 3.8 (p &lt; 0.0001) 1 yr post-SSIPR.</b>