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An Official American Thoracic Society/European Respiratory Society Policy Statement: Enhancing Implementation, Use, and Delivery of Pulmonary Rehabilitation.

Authors: Rochester et al.

Reference: Am J Respir Crit Care Med 2015; 192(11): 1373–1386.

URL: <http://www.atsjournals.org/doi/full/10.1164/rccm.201510-1966ST#readcube-epdf>

Despite the substantial benefits of pulmonary rehabilitation (PR) for people with chronic respiratory disease, insufficient funds and resource, lack of healthcare professionals and patient awareness and specific patient-related barriers contribute to the paucity in delivering PR services for suitable individuals. This policy statement provides recommendations for increasing awareness and knowledge of PR in healthcare professional trainees and clinicians and in patients, highlighting the clinical and cost effective benefits and advocating for provision of access to training in program delivery for healthcare professionals. To improve patient access to PR, recommendations include the development of new programs in geographical locations where demand exceeds capacity, the inclusion of patients with respiratory conditions other than COPD and creation of new models of PR (including home-based and tele-rehabilitation approaches). Program quality should be ensured by adherence to evidence-based clinical guidelines, with outcomes established to enable national and international benchmarking in PR. Programs should strive to foster patients' long term adherence to health-enhancing behaviours to maximise well-being and reduce the costs of healthcare. Suggestions for future research to further the evidence-based in PR were also outlined.

Smallest worthwhile effect of land-based and water-based pulmonary rehabilitation for COPD.

Authors: McNamara et al.

ERJ Open 2015; 1:00007-2015

URL: <http://openres.ersjournals.com/content/erjor/1/1/00007-2015.full.pdf>

McNamara and colleagues have previously reported the clinical merits of water-based exercise compared to land-based in patients with chronic obstructive pulmonary disease with physical comorbidities. This study was examining the smallest worthwhile effect of either type of exercise training on the 6-minute walk distance. Using the benefit-harm trade-off method, patients estimated the smallest improvement with each type of rehabilitation which would outweigh the associated costs, risks or inconvenience. The smallest worthwhile difference for water-based exercise was 26m and for land-based exercise was 20m. Patients typically reported that PR would be worthwhile if an improvement by 6% in the 6-minute walk distance was achieved.

Longer Versus Shorter Duration of Rehabilitation Following Lung Transplantation: A Randomised Trial.

Authors: Fuller et al.

Reference: Arch Phys Med Rehabil 2016

URL: <http://www.sciencedirect.com/science/article/pii/S0003999316310991>

This study compared the effects of a long (14 week) versus short (7 week) supervised outpatient rehabilitation program following lung transplantation. Adult lung transplant recipients (single or bilateral lung) were allocated to either the short or long program, with endurance exercise and upper and lower limb strength training completed thrice weekly. The authors found a similar improvement in 6-minute walk distance, quadriceps strength and health related quality of life 6 months' post program. With comparable outcomes in exercise capacity and quality of life, it suggests that a shorter duration of training which aligns with the international recommendations for pulmonary rehabilitation achieves clinically significant outcomes in this population.

Home-based rehabilitation for COPD using minimal resources: a randomised, controlled equivalence trial.

Authors: Holland et al.

Reference: Thorax 2016: doi:10.1136/thoraxjnl-2016-208514

URL: <http://thorax.bmj.com/content/early/2016/09/26/thoraxjnl-2016-208514.full.pdf+html>

The authors have identified, in a previous paper, that uptake of traditional centre-based pulmonary rehabilitation (PR) is poor due to patient reported barriers of transport and travel. In this study, the authors compared an outpatient, centre-based PR model to a home-based program in patients with COPD. The home-based PR program consisted of one home visit and weekly telephone calls from a physiotherapist, using motivational interviewing techniques. Findings immediately post program demonstrated equivalent changes in 6-minute walking distance and quality of life in both programs, although gains were not maintained 12 months' post program completion. This suggests the home-based PR for people with COPD could be a suitable option for individuals who are unable to access a centre-based program.

Do self-management interventions in COPD patients work and which patients benefit most? An individual patient data meta-analysis.

Authors: Jonkman et al.

Reference: Int J Chron Obstruct Pulmon Dis 2016;11:2063-2074.

URL: <https://www.dovepress.com/do-self-management-interventions-in-copd-patients-work-and-which-patients-benefit-most-peer-reviewed-fulltext-article-COPD>.

Jonkman and colleagues undertook this systematic review to summarise the evidence of the effectiveness of self-management interventions and identifying subgroups of people with COPD who most benefit from this treatment approach. Of the 14 trials of 3282 patients, self-management interventions improved health-related quality of life at 12 months and lengthened the time to first respiratory-related hospitalisation. Self-management was more

effective in males, those with more severe lung disease, moderate self-efficacy and a higher body mass index. These clinical improvements support the implementation of self-management strategies in COPD.

A randomized controlled trial of telephone-mentoring with home-based walking preceding rehabilitation in COPD.

Authors: Cameron-Tucker et al

Reference: Int J Chronc Obstruct Pulmon Dis 2016, 11: 1991-2000.

URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003521/>

In response to the limited access of pulmonary rehabilitation, alternative methods to encourage daily physical activity and exercise in people with COPD are needed. In this study, prior to undertaking supervised PR, individuals were provided with structured education encouraging self-management skill development and established a home-based walking program directed towards meeting guidelines for physical activity. Telephone mentoring to support the home-walking action plan was provided, with an average of 3 calls per patient over 8-12 weeks. This was compared to usual care (no walking program or mentoring) while waiting for PR. Following 8-12 weeks, all participants completing a traditional PR program. The lack of change in 6-minute walk distance and health status in those receiving the telephone mentoring at the start of PR highlights the challenges in encouraging physical activity in this population.

Efficacy of an mHealth intervention to stimulate physical activity in COPD patients after pulmonary rehabilitation.

Authors: Vorrink et al.

Reference: Euro Respir J 2016; 48(4): 1019-1029.

URL: <http://erj.ersjournals.com/content/erj/early/2016/08/31/13993003.00083-2016.full.pdf>

Physical inactivity in people with chronic obstructive pulmonary disease (COPD) is linked to poor health and heightened disease burden. Following pulmonary rehabilitation (PR), participants were allocated to using a smartphone which recorded their physical activity (via embedded accelerometer) or usual care. Participants wore the smart phone in a waist pouch to record physical activity data and this provided them with personalised physical activity goals via automated messages and emoticons. Physiotherapists were able to adjust physical activity goals based on individual ability via a monitoring website. No differences in the number of steps per day was noted between groups and there was a significant decline in physical activity over the longer term, suggesting that this form of mHealth technology was unable to prevent decline in physical activity in patients with COPD post PR.

Physical frailty and pulmonary rehabilitation in COPD: a prospective cohort study.

Authors: Maddocks et al.

Reference: Thorax 2016; 71(11): 988-995.

URL: <http://thorax.bmj.com/content/early/2016/06/06/thoraxjnl-2016-208460.full.pdf+html>

The clinical syndrome of frailty is well described in the older population, but its relevance and impact upon pulmonary rehabilitation outcomes in individuals with chronic obstructive pulmonary disease (COPD) is unclear. Maddocks and colleagues assessed frailty using the Fried criteria (weight loss, exhaustion, low physical activity, slowness and weakness) before and after PR. The prevalence of frailty was 26%, was more common in women and increased with age, GOLD stage, degree of dyspnoea and age-adjusted comorbidity burden. Frail individuals were at greater risk of program non-completion, due to acute exacerbations and/or hospitalisation. Frail individuals who completed PR achieved improvements in physical activity, exercise performance and quality of life. Of the completers of PR who were classed as frail at the start of PR, 62% were classed as pre-frail upon program completion. Frailty appears to be a common clinical syndrome in patients with COPD referred to PR, but the improvements noted and reversal of frailty status in the short term illustrates that frail individuals with COPD respond favourably to PR.

Long-term exercise maintenance in COPD via telerehabilitation: a two-year pilot study.

Authors: Zanaboni P

Reference: J Telemed Telecare 2016; pii: 1357633X15625545

URL: <http://jtt.sagepub.com/content/early/2016/02/16/1357633X15625545.full.pdf+html>

Maintaining exercise capacity over the longer term is a challenge of pulmonary rehabilitation (PR) but one option to achieving this goal is through telerehabilitation. A two-year telerehabilitation program was provided following completion of PR with the program composed of home exercise using a treadmill, pulse oximeter, telemonitoring via a tablet and self-management with the support of weekly videoconferencing. At one year follow up, the 6-minute walk distance improved by 40m, with corresponding reduction in dyspnoea and improvements in health status. Physical performance and quality of life were maintained at two years. This longer term approach to exercise maintenance in COPD is a feasible option which can be applied over the long-term and enable clinical improvements to be achieved.

The Minimal Important Difference in Physical Activity in Patients with COPD.

Authors: DeMeyer et al.

Reference: PLoS One 2016;11(4): e0154587

URL: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154587>

With levels of physical activity an important clinical entity in people with chronic obstructive pulmonary disease (COPD), identifying the minimal important difference is clinically relevant. DeMeyer and colleagues measured physical activity for one week using the Sensewear Pro Armband or the Actigraph GT3X in individuals with COPD enrolled in pulmonary rehabilitation, with the daily number of steps the selected outcome. The minimal important difference for daily steps ranged between 600 and 1100 steps. Individuals who exceeded the minimal important difference (greater than 600 steps) had a reduced risk for hospital admission in the initial two years post rehabilitation.

One-Legged Cycle Training for Chronic Obstructive Pulmonary Disease. A Pragmatic Study of Implementation to Pulmonary Rehabilitation.

Authors: Evans et al.

Reference. Ann Am Thorac Soc 2015;12(10): 1490-1497.

URL: <http://www.atsjournals.org/doi/pdf/10.1513/AnnalsATS.201504-231OC>

Previous studies have illustrated that partitioned exercise training using one-legged cycling results in greater improvement in peak oxygen uptake compared to conventional two-legged cycling. The authors of this study evaluated the feasibility of incorporating one-legged cycling as a principal mode of aerobic training in pulmonary rehabilitation (PR) in patients with COPD. One-legged cycling was undertaken three times per week for 6-8 weeks, 15 minutes of cycling performed on each leg per session. Peak oxygen uptake increased 8% from baseline, which the change in 6-minute walk distance (72m) and health-related quality of life were clinically significant. This mode of training was considered safe and successfully implemented into an existing PR program.

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