COPD and Functional Fitness

Authors: J. Dylan James, Chad Cissell, Jay Jolly

**PICO Question**

➢ For patients with COPD, does strength training or aerobic training better improve overall functional fitness (ADL's)?

**What is COPD?**

➢ Chronic obstructive pulmonary disease (COPD) is a combination of diseases identified as emphysema, chronic bronchitis, and bronchoconstriction or asthma. It consists of progressive airflow limitations that are not fully reversible, and involves a chronic inflammatory response of the airways. COPD can be the result of multiple factors, and the two primary causes are smoking and genetics. The results of COPD are poor gas exchange and reduced lung function, which can affect a person’s ability to complete activities of daily living (ADLs).

**COPD Signs and Symptoms**

**Signs**

➢ Elevation of shoulder girdle
➢ Horizontal ribs
➢ Barrel-shaped thorax
➢ Low, flattened diaphragm
➢ Skeletal muscle weakness
➢ Depression and Anxiety
➢ Cognitive Impairments

**Symptoms**

➢ Dyspnea on Exertion (DOE)
➢ Secretion production
➢ Cough

**Evidence**

➢ The addition of strength training to traditional pulmonary rehab may improve participants’ strength and their ability to perform functional fitness (FF) tasks closely related to ADL’s. ¹

➢ Moderate effect size for chair-stand test and the 8-foot up-and-go test

➢ Training program with strength training alone is capable to significantly improve exercise capacity and muscle strength. Progressive strength training alone increases not only muscle strength and quality of life, but also exercise capacity in patients with COPD.²

➢ Significant increases for the strength training and combined group in exercise capacity, peak oxygen uptake, and muscle strength when compared to the exercise training group.

➢ When comparing the effects of resistance training prior to aerobic training, the sequential approach was not associated with greater gains in functional status than aerobic training alone or concurrent aerobic and resistance training.³

➢ Improvements in aerobic exercise performance and muscle strength were not statistically significant between groups.

➢ With a systematic review of 13 articles, strength training was found to have strong evidence for improving upper body and leg strength.⁴

**Evidence**

➢ Research supports the effectiveness of strength training to improve functional fitness in patients with COPD as compared with exercise training. In addition, the studies we found show that a combination of traditional exercise training and strength training might be the most effective for functional fitness. The protocol we saw for strength training included 2 days/week x 12 weeks and consisted of 8 exercises involving major muscle groups with increasing a set every 4 weeks to achieve a total of 4 sets.⁵ As a result of these findings, we would suggest that healthcare providers focus on a combination of both strength and aerobic training to most effectively treat patients.

**Conclusion and Clinical Application**

➢ Therapist should incorporate both strength and aerobic training when treating COPD patients.

**Level of Evidence**

• Article 4 is a systematic review, level 1 on evidence hierarchy
• Articles 1-3 are randomized control trials, level 2 on evidence hierarchy

**References**


**Clinical Bottom Line**

http://lungpictures.org/Copd-Lungs-Pictures.php