Katherine R. Arlinghaus, MS, RD, Melissa M. Markofski, PhD,
and Craig A. Johnston, PhD

Reducing Anxiety to Increase Exercise in Individuals With Decreased Lung Capacity

Abstract: *The management of chronic disease is complex. For many diseases, the treatment for the disease may mimic disease symptoms. For example, exercise training is recommended as part of the treatment of chronic obstructive pulmonary disease (COPD). Individuals may confuse the physiological experiences related to exercise with COPD symptoms. This type of association between treatment and disease can cause anxiety. For health care practitioners to successfully motivate their patients to make the necessary behavior changes for disease treatment, anxiety must also be addressed.*

Keywords: respiratory disease; chronic disease; anxiety; chronic obstructive pulmonary disease; exercise

The prevention, management, and treatment of chronic disease are complex. For most chronic conditions, the cause of disease is unknown and likely involves a variety of genetic, lifestyle, and environmental factors. For example, in this issue, Seguel et al¹ address the complexity of

a specific contributing factor of respiratory disease, poor indoor air quality. Also in this issue, O'Reilly² broadens the discussion with his overview of chronic obstructive pulmonary disease (COPD) by highlighting the multifaceted nature of respiratory diseases and how they frequently overlap with other conditions. Because of the longevity

strategy for this is to use person-first language³: for example, “the patient with diabetes,” instead of “the diabetic patient.” Adopting this kind of language, however, is not sufficient. The treatment of disease, especially when that treatment affects a person's daily life, such as the checking of glucose levels, constantly reminds the patient that they have a disease. Frequently, individuals

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The role health care practitioners (HCPs) play in the management of chronic disease puts them in a position to help patients avoid making their disease central to their identity. One

with obesity dislike weighing themselves. The scale seems to judge them and reminds them that they have a disease.⁴ This scenario is more dramatic when the treatment resembles the disease. For example, when individuals with COPD exercise they are likely to experience shortness of breath, which mimics a symptom of the disease.

DOI: 10.1177/1559827617703058. From the Department of Health and Human Performance, University of Houston, Houston, Texas. Address correspondence to: Craig A. Johnston, PhD, Department of Health and Human Performance, University of Houston, Houston, TX 77030; e-mail: cajohn25@central.uh.edu.

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Physical Activity and Pulmonary Rehabilitation

Consistent with the physical activity recommendation by O'Reilly² in this issue, both cardiorespiratory and resistance exercise training can independently improve health and quality of life, and exercise has explicit implications for individuals with COPD. For example, outpatient pulmonary rehabilitation participants with low exercise performance have higher mortality than those with higher exercise performance.⁵ Regular exercise also improves symptoms and quality of life for individuals with COPD.^{6,7} Furthermore, exercise training during hospitalizations related to COPD exacerbation improves quality of life, exercise capacity, and muscular strength and function.^{8,9} The benefits for individuals with COPD vary by the type of exercise, suggesting that the exercise training prescription for a person with COPD should include both aerobic and resistance exercise training. Although exercise training likely does not improve the lung physiology in people with COPD, there is abundant evidence to support the fact that regular exercise training improves quality of life and skeletal muscle function in individuals with COPD. Furthermore, exercise-induced increases in skeletal muscle mass, strength, and function, as well as increased exercise tolerance and capacity, can help compensate for functional decreases related to physiological lung impairment caused by COPD.

Individuals with COPD have low exercise tolerance and reduced exercise capacity; therefore, an exercise training program to improve cardiorespiratory fitness is frequently recommended. If individuals are referred for pulmonary rehabilitation, they will typically participate in aerobic, strength, and flexibility exercises. The intensity of aerobic exercise in a short (8-week) version of such a pulmonary rehabilitation program may not have much influence on functional outcomes. Specifically, similar improvements in quality of life, symptom control, and exercise tolerance were observed after eight weeks between patients who

exercised at 60% of maximum work rate and patients who exercised at 80% of maximum work rate.¹⁰ As with individuals without COPD who exercise, patients may also see improvements in maximal workload, exercise capacity,¹¹ and systolic cardiac function,¹² which may contribute to the improvements in exercise capacity and tolerance.

One of the health concerns of COPD is that the patient has a high level of systemic inflammation and decreased skeletal muscle mass, strength, and function. Mounting evidence among both the general older adult population¹³ and individuals with COPD¹⁴ supports a relationship between increased proinflammatory biomarkers and low muscle mass and function. This is of particular relevance because individuals with COPD have higher circulating proinflammatory biomarkers than age-matched healthy controls; however, despite the elevated pro-inflammatory biomarkers the individuals with COPD will still respond to exercise training.¹⁵ This is important for the individual, because although there is not necessarily a causal relationship between lung health and skeletal muscle strength in the extremities, people with greater muscle strength can perform activities of daily living and walk with greater ease. This can lead to better scores on tests of exercise capacity and quality-of-life surveys, which are 2 important components of COPD exercise training efficiency evaluation. Fortunately, short-term resistance exercise training in individuals with COPD can increase muscle function. In a 12-week aerobic training program with or without the inclusion of a resistance exercise component, the group participating in a program with both aerobic and resistance exercise increased muscle mass, strength, and function more than the group who participated in the program with only aerobic exercise.¹⁶ Resistance training alone can also increase muscle force and function.⁹ This finding extends to all programs whether the modality is conventional resistance exercise, elastic tubing resistance exercises,¹⁷ or ankle weight cuffs.¹⁸

There may be distinct improvements in COPD outcomes from aerobic versus

resistance exercise, and many pulmonary rehabilitation programs will include both types of exercise. Despite a similar increase in maximal strength, the combination of resistance and aerobic exercise training improved muscle power and maximal workload more than a program of similar length that only used resistance exercise training.¹⁹ Furthermore, a combined program may improve cognitive function to a greater degree than a program with only aerobic training.²⁰ There is clear evidence that exercise helps reduce mortality and increase physical functioning in people with COPD, and it should continue to be encouraged in COPD patients.

Despite these benefits to individuals with COPD, their perceived physiological response to exercise could easily be interpreted as a worsening of their COPD symptoms, not as a treatment to improve their quality of life. This can put HCPs in a difficult position because, for many patients, the treatment of disease becomes associated with anxiety about having the disease.²¹ It is very difficult for behavior change to occur when an individual has a high level of anxiety. Therefore, anxiety must be treated along with the behavior change.²²

Importance of Relaxation Techniques

Most relaxation techniques have a component of deep breathing associated with them. Deep breathing, yoga breathing, diaphragmatic breathing, and pursed-lip breathing have all been shown to improve ineffective breathing patterns, reduce levels of anxiety, and have an overall positive impact on individuals who experience difficulty in breathing.^{23,24} These improvements may be enhanced when biofeedback devices are used.²⁵⁻²⁷ A randomized controlled trial demonstrated positive changes in breathing patterns and perceived change of breathlessness in patients with COPD who used guided deep breathing with a biofeedback device.²⁸ These techniques should be encouraged in individuals who have difficulty breathing and can be used during times of increased anxiety to

help normalize breathing and reduce anxiety. Patients with COPD may find these techniques to be especially beneficial during bouts of exercise.

Conclusion

Exercise training is an important component of the treatment of COPD. However, motivating individuals with chronic diseases to regularly participate in exercise can be very challenging. This is especially true for COPD because the shortness of breath experienced during exercise may resemble a COPD symptom, which could lead to anxiety. Since individuals are unlikely to make behavior changes when they are anxious, it is critical that HCPs address anxiety when motivating individuals with COPD to meet exercise training recommendations.

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. **AJLM**

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