

Computer game helps COPD patients breathe better

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Patients with chronic obstructive pulmonary disease (COPD) may gain better control over their breathing and breathe more efficiently by using their breath to play a computer game, according to new research.

“COPD is a double-edged sword: the incapacitating lung condition can cause such serious shortness of breath that every-day physical activity, such as walking a flight of stairs, becomes unduly burdensome—and yet one of the few effective symptomatic treatments for COPD is the very thing that its victims dread most: exercise,” said leading researcher Eileen G. Collins, Ph.D., of the Edward Hines Jr. VA Hospital in Hines, Illinois and UIC. “This computerized program is still in the research stages, but shows promise for future use in pulmonary rehabilitation programs.”

The results of this randomized, controlled study appeared in the April 15 issue of the *American Journal of Respiratory and Critical Care Medicine*, published by the American Thoracic Society.

COPD patients with the greatest disability are also those most likely to be unable to exercise long enough to reap the benefits rehabilitation can offer them. “One of the key mechanisms of shortness of breath and exercise impairment in these patients,” Dr. Collins said, “is their inability to fully exhale air when active.” This phenomenon causes trapping of air in the lungs—i.e., dynamic hyperinflation—and diminishes the patient’s breathing efficiency.

Dr. Collins and colleagues designed a randomized, controlled trial, the first of its kind, to test whether this computer program could decrease the extent of air trapping during exercise and thus improve the results of rehabilitation in COPD patients. “Our primary goal was to determine if patients with COPD would achieve longer exercise duration if they were engaged in ventilation feedback, in addition to the regular exercise program over either ventilation feedback or exercise alone,” said Dr. Collins.

A total of 64 patients were randomized to three groups— exercise alone, exercise plus ventilation feedback (VF) or VF alone. VF patients had their breathing monitored by a computer program which provided them with real-time biofeedback and set individualized goals, presented graphically on a screen in front of them. Patients could see their current speed and depth of breathing in relation to the set goal, encouraging them to inhale more slowly and exhale more completely in order to achieve the goal.

At baseline, the groups all performed similarly in exercise tolerance tests. Comparing all the groups, those that underwent a regimen of exercise and ventilation feedback showed significant improvements in exercise duration, and those who underwent exercise alone fared much better than those who only received ventilation feedback. Because of the multiple comparisons between groups, the exercise-plus-ventilation feedback group did not attain statistically significant improvements over the exercise-only group, but the results indicated a strong trend in that direction. Exercise-induced hyperinflation was also reduced in patients randomized to exercise-plus-ventilation feedback over either program by itself. Duration of exercise tolerance in the exercise-plus-ventilation feedback group also showed a significant trend toward improvement.

If patients can be taught to translate these breathing techniques from the computer game to activities of daily living, they could potentially greatly

improve their quality of life. “We are conducting a follow-up clinical trial to compare computerized breathing feedback with other unique methods of pulmonary rehabilitation,” said Dr. Collins.

Source: American Thoracic Society

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