

Smoking cessation care received by veterans with chronic obstructive pulmonary disease

Scott E. Sherman, MD, MPH; Andy B. Lanto, MA; Margaret Nield, RN, PhD; Elizabeth M. Yano, PhD

Purpose of the Work. Smoking is the main cause of chronic obstructive pulmonary disease (COPD), and smoking cessation is the only effective intervention to slow its progression. We examined whether smokers with COPD received more cessation services than smokers without COPD. **Subjects and Procedures.** Current smokers from 18 Veterans Health Administration primary care clinics completed baseline and 12 month followup surveys (baseline $n = 1941$; 12 month $n = 1080$), composed of validated questions on smoking habits, history, and attitudes; health/functional status; and sociodemographics. **Results.** Both at baseline and 12 month followup, smokers with COPD were more likely to report that they had been advised to quit, prescribed nicotine patches, or referred to a smoking cessation program within the last year. However, the rate of quitting smoking was the same for smokers with and without COPD. Most of the differences in cessation services received by smokers with COPD were for smokers not interested in quitting. **Relevance to the Veteran Population.** New approaches may be required, particularly to help smokers not interested in quitting.

Scott E. Sherman, MD, MPH

Critical outcomes in pulmonary rehabilitation: Assessment and evaluation of dyspnea and fatigue

Paula M. Meek, PhD, RN; Suzanne C. Lareau, RN, MS

Purpose of the Work. This article describes measures used in pulmonary rehabilitation to evaluate two common symptoms experienced by COPD patients, dyspnea and fatigue. **Subjects and Procedures.** We review measures used to evaluate symptoms. **Results.** Dyspnea and fatigue can be measured with a variety of instruments. The strengths and weaknesses of each should be evaluated before they are used, since instruments do not all measure the same dimension of symptoms. **Relevance to the Veteran Population.** The veteran population experiences COPD to the same degree as nonveterans. Pulmonary

rehabilitation has been shown to decrease symptoms, improve exercise tolerance, and reduce the length of hospitalization. The outcome measures described here can guide those evaluating the effects of such interventions as pulmonary rehabilitation on these symptoms among veterans.

Paula M. Meek, PhD, RN

Controlled breathing and dyspnea in patients with chronic obstructive pulmonary disease (COPD)

Rik Gosselink, PT, PhD

Purpose of the Work. To address the efficacy of controlled breathing to treat the symptoms of chronic obstructive pulmonary disease (COPD), especially dyspnea. This might help to better understand the application of these techniques in the rehabilitation of COPD patients and target those patients that may benefit from controlled breathing. **Procedures.** Relevant papers on breathing exercises in COPD were retrieved from publication databases and analyzed. **Results.** Controlled breathing has proven effective in chronic lung disease. Evidence for this effectiveness is more firmly stated for pursed-lips breathing, active expiration, forward leaning position, and inspiratory muscle training. However, application of these treatment modalities requires careful patient selection, proper instruction and control of the techniques, and repeated assessment of the effects of the treatment. The absence of transfer effects of breathing exercises in resting conditions to exercise conditions raises several questions that need to be addressed in further research. **Relevance for the Veteran Population.** COPD is a disease of the elderly, mainly males and smokers with significant morbidity and mortality. COPD affects an increasing number of (elderly) people and has a significant impact on quality of life, use of health care resources, certified incapacity, and mortality. Treatment with drugs has only limited effectiveness. Other treatment modalities—in particular, rehabilitation—have been shown to improve symptoms and quality of life, and reduce significantly the use of health care resources. The content of these rehabilitation programs deserves more attention from both the scientific and clinical points of view.

Rik Gosselink, PT, PhD

Effect of ventilation-feedback training on endurance and perceived breathlessness during constant work-rate leg-cycle exercise in patients with COPD

Eileen G. Collins, RN, PhD; Linda Fehr, MS; Christine Bammert, MS; Susan O'Connell, RN, MBA; Franco Laghi, MD; Karla Hanson, MS; Eileen Hagarty, RN, MS; W. Edwin Langbein, PhD

Purpose of the Work. Chronic obstructive pulmonary disease (COPD) refers to individuals with chronic bronchitis or emphysema who have marked obstruction to airflow. The symptoms of lung disease triggered by simple, low-intensity activities of daily living, such as dressing and undressing, bathing, and shopping are insufferable; consequently, many of these individuals become sedentary. This study evaluates the effectiveness of a unique program of ventilation-feedback training combined with leg-cycle exercise to improve endurance and perceived breathlessness of patients with COPD. **Subjects and Procedures.** Thirty-nine patients with moderate to severe COPD were randomized to one of three 6 week experimental interventions: ventilation-feedback with exercise, exercise only, or ventilation-feedback only. Patients completed a constant work-rate leg-cycling test at baseline and 6 weeks. **Results.** Exercise duration increased within the groups by 103, 66, and 4 percent for the ventilation-feedback with exercise, exercise only, and ventilation-feedback groups, respectively. After 6 weeks, the ventilation-feedback with exercise and exercise only groups reported significantly less perceived breathlessness and exertion. Based on these preliminary data, ventilation-feedback with exercise and exercise only were equally effective in improving leg-cycle exercise tolerance in patients with COPD. **Relevance to the Veteran Population.** Pulmonary rehabilitation is essential to help COPD patients cope with their disease. If proven effective, ventilation-feedback can contribute to the control and alleviation of the symptoms of COPD and help patients develop the capacity to carry out the activities of daily living without undue stress.

Eileen G. Collins, RN, PhD

Bodies in motion: Monitoring daily activity and exercise with motion sensors in people with chronic pulmonary disease

Bonnie G. Steele, PhD, ARNP; Basia Belza, PhD, RN; Kevin Cain, PhD; Catherine Warms, PhD, ARNP, CRRN; Jeff Coppersmith, MS, CSCS; JoEllen Howard, BS, GCS

Purpose of the Work. To provide an overview of the potential utility of motion sensors to measure physical activity in persons with chronic pulmonary disease in the setting of pulmonary rehabilitation. **Subjects and Procedures.** Persons with chronic pulmonary disease. **Results.** N/A—review paper. **Relevance to the Veteran Population.** It has been estimated that 6 to 8 percent of veterans who receive medical care in the Veterans Affairs (VA) system carry a diagnosis of chronic lung disease. Virtually all these patients, and particularly those who suffer the functional and psychological effects of chronic obstructive pulmonary disease, are among the heaviest users of both inpatient and outpatient services. Providing therapeutics that target physical functioning in these veterans is a high priority. The measurement of daily activity is an important variable in almost all rehabilitation settings, including pulmonary rehabilitation. Methodologies such as the use of motion sensors to measure this elusive variable have potential utility as process and outcome measures in these and other VA care venues where physical functioning is targeted for treatment. In addition, motion sensors have potential usefulness as adjuncts to promote adherence to exercise programs, not only in cardiopulmonary patients, but in the frail elderly, with weight reduction programs, and in health maintenance programs as a surveillance tool.

Bonnie G. Steele, PhD, RN

Exercise training in chronic obstructive pulmonary disease

Carolyn L. Rochester, MD

Purpose of the Work. Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity, mortality, and health care utilization. COPD is an extremely common health problem in the veteran population because of cigarette smoking trends. Persons affected by COPD

experience functional limitation related to both ventilatory impairment and skeletal muscle dysfunction. Patients with COPD who have muscle dysfunction and functional impairment often have increased utilization of healthcare resources and higher mortality. Importantly, unlike permanent structural abnormalities in the lung, the skeletal muscle dysfunction associated with COPD is reversible with exercise training. **Results.** This article reviews the factors contributing to exercise intolerance and the physiologic basis of skeletal muscle dysfunction in COPD, as well as the clinical benefits of and patient candidacy for exercise training. The rationale for and outcomes of different types of lower and upper extremity exercise training and ventilatory muscle training are discussed, and the potential for anabolic hormone supplementation to optimize the benefits of exercise training is considered. **Relevance to the Veteran Population.** This topic is of crucial importance to the veteran population, because so many veterans are affected by exercise intolerance related to COPD. Such persons may have difficulty participating in work, recreational, and social activities. Individuals with severe disease typically also have difficulty performing the activities of daily living, including household maintenance and self-care. This article strives to heighten awareness of the rationale for and benefits of exercise training for persons with this condition, to foster development and implementation of exercise training/pulmonary rehabilitation programs, so that veterans can achieve the highest functional status possible in spite of their chronic respiratory disease. This, in turn, has the potential to optimize the use of health care resources and improve clinical outcomes for persons with COPD.

Carolyn L. Rochester, MD

Nonpharmacologic adjuncts to training during pulmonary rehabilitation: The role of supplemental oxygen and noninvasive ventilation

Guy W. Soo Hoo, MD, MPH

Purpose of the work. This paper reviews the role and benefit of oxygen and noninvasive ventilation for COPD patients when used during exercise and during pulmonary rehabilitation. **Subjects and Procedures.** Supplemental oxygen and noninvasive ventilation for COPD patients undergoing pulmonary rehabilitation. **Results.** One prob-

lem with exercise in COPD patients undergoing pulmonary rehabilitation is that patients may not be able to exercise at a level that produces a training effect. Oxygen has many benefits and most trials with oxygen demonstrate improvement in shortness of breath and exercise capacity, with lower breathing rates and less work expended for the same level of exercise. However, added oxygen during pulmonary rehabilitation has not been proven to increase the training effect over room air. In short-term studies, noninvasive ventilation also improves symptoms and exercise capacity. When used during a pulmonary rehabilitation program, it may be most effective in those with the worst lung function. Using noninvasive ventilation at night as patients sleep may also help during a pulmonary rehabilitation program. **Relevance to the Veteran Population.** Since many veterans have severe COPD, anything that can boost their exercise performance during pulmonary rehabilitation may help them benefit more from the program. It is important to recognize both the benefits and limitations of oxygen and noninvasive ventilation in these programs.

Guy W. Soo Hoo, MD, MPH

Using an evidence-based protocol to guide rehabilitation and weaning of ventilator-dependent cervical spinal cord injury patients

Charles J. Gutierrez, MS, RRT;
Jeffrey Harrow, MD, PhD; Fred Haines, RRT

Purpose of the work. This pilot study was undertaken to determine the effectiveness of an evidence-based protocol in helping ventilator-dependent spinal cord injury veteran patients achieve discontinuation of mechanical ventilation. **Subjects.** Ventilator-dependent spinal cord injury veteran patients **Results.** Improvements occurred in inspiratory and expiratory muscle strength and in endurance time on and off the ventilator as a result of using the evidence-based protocol described. Patients with high and low tetraplegia achieved gains in on-vent endurance time and patients with low tetraplegia achieved discontinuation of mechanical ventilation. **Relevance to the Veteran Population.** The current protocol may enable high tetraplegic veteran patients to achieve spontaneous ventilation in an emergency, and may enable low tetraplegic patients to achieve discontinuation of mechanical ventilation.

Multicenter research involving larger numbers of veteran patients should be undertaken to determine the precise impact of resistance and endurance training according to lesion level and completeness. This research is relevant

because of the dearth of reliable information for optimally guiding the management of this population of veteran patients.

Charles J. Gutierrez, MS, RRT