

Inhalation of hypertonic saline aerosol is commonly used for sputum induction. More recently, it has been used therapeutically for airway clearance in patients with cystic fibrosis. This has led to speculation about its potential benefit in patients with pulmonary disorders such as chronic obstructive pulmonary disease (COPD). It is with this background that the paper by Valderramas and Atallah is important. This double-blind randomized controlled trial of out-patients with COPD reported no benefit for hypertonic saline inhalation compared with normal saline inhalation. Moreover, adverse effects, such as cough or bronchospasm, occurred in 12% of patients in the hypertonic saline group. As stated in the accompanying editorial by Rubin, this study points out the importance of exercise in the care of patients with chronic obstructive lung disease. Furthermore, hypertonic saline inhalation may decrease the benefits of exercise in this patient population.

Obesity is a public health problem, the ramifications of which are increasingly impacting the in-hospital care of these patients. As pointed out in the editorial by Gentile, specialized equipment and consideration of altered anatomy and physiology are required for transportation, diagnostic testing, physical examination, and medication dosing of obese patients. Benedik et al evaluated the effects of body position on resting lung volume in overweight and mildly to moderately obese subjects. They found that the 30° Fowler's position did *not* increase functional residual capacity in healthy overweight to moderately obese subjects. This suggests that this historical principle of pulmonary physiology may not apply to the body mass index range of almost 67% of Americans. Clinicians may need to modify current practice when the clinical goal is to improve resting lung volume in a sedentary obese patient. As Gentile suggests in his editorial, further work is needed to identify the optimal position for patients with obesity.

High frequency chest wall compression (HFCWC) is an airway clearance technique that is used increasingly in hospitalized patients. James Allan et al evaluated this therapy during the 48 hours following thoracic surgery. They used the Vest, at 12 hertz, for 10 minutes and compared this to percussive chest physiotherapy. No major adverse events were encountered, and 84% of the subjects reported little or no discomfort during therapy. HFCWC was favored over conventional chest physiotherapy by more than two to one. As pointed out in the editorial by Wheeler, this study does not address the clinical efficacy of HFCWC in this patient population. Wheeler recommends an *n*-of-1 construct as an evidence-based patient-centered approach to determine whether this, or another, airway clearance therapy is appropriate for an individual patient.

High level evidence supports the use of supplemental oxygen in the care of hypoxemic patients with COPD. Newer systems for long term oxygen therapy are designed to provide a longer operating time and to allow greater ambulation. Strickland et al conducted a randomized prospective study of portable oxygen delivery systems during exercise. They found that there were no significant differences between the 4 ambulatory oxygen systems that they evaluated. As indicated by McCoy and Carlin in an accompanying editorial, product performance variability with home portable oxygen systems may impact patient performance outcomes. Clinical research is

needed to develop an evidence-based foundation for long term oxygen therapy in ambulatory patients. This is necessary to ensure that patients are appropriately treated in the most efficient and cost-effective manner.

Delivery of adequate humidification is a concern when using high frequency percussive ventilation (HFPV). Patrick Allan et al evaluated 5 humidifiers during HFPV with a lung model. They found that the distinctive gas flow mechanism used during HFPV may impair the efficacy of a heated humidifier. They further recommend that all humidification systems should undergo dedicated testing with HFPV prior to clinical use.

Patients with neuromuscular disease typically have cough impairment. Toussaint et al studied cough-augmentation therapies in stable patients with various neuromuscular diseases. Compared to manually assisted cough and breath-stacking alone, these therapies applied together most improved unassisted peak cough flow. In stable patients with neuromuscular diseases, the effectiveness of cough-augmentation techniques can be predicted with measurements of maximum respiratory capacity. Patients with vital capacity > 340 mL and maximal expiratory pressure < 34 cm H<sub>2</sub>O optimally benefit from the combination of breath-stacking plus manually assisted cough to improve peak cough flow to > 180 L/min.

Seymour et al evaluated closed-system endotracheal suctioning in spontaneously breathing patients receiving mechanical ventilation. They found that post-suctioning changes in the measured variables persisted longer in these spontaneously breathing patients weaning from mechanical ventilation than in patients who are sedated and paralyzed. Although the clinical importance of these findings is unclear, this difference is something that should be appreciated by clinicians when closed suctioning is used.

The future role of the respiratory therapist is open to debate. To address this issue, the American Association for Respiratory Care established a task force to envision the respiratory therapist of the future. The goal is to identify potential new duties and responsibilities of respiratory therapists in 2015 and beyond, and to suggest the elements of education, training, and competency documentation needed to assure safe and effective execution of those responsibilities. The initial findings of this task force are presented by Kacmarek et al in this issue of the Journal.

This month's case report deals with pulmonary embolectomy and questions whether this procedure should be offered earlier rather than later. This is an important question because deep venous thrombosis and pulmonary embolism are associated with approximately 250,000 hospitalizations each year. Moreover, nearly 70% of patients who die of a pulmonary embolism do so within the first hour after onset of symptoms. Le and Dewan report 3 cases of massive to submassive pulmonary embolism successfully treated with pulmonary embolectomy.

The *Teaching Case of the Month*, by Ninaber et al, is a case of severe hypoxemia in liver cirrhosis. This case reminds us that severe hypoxemia can occur without symptoms in patients with liver cirrhosis. Hypoxemic patients should be screened for hepatopulmonary syndrome because of the risk of mortality in pre-transplant patients.