Editor's Commentary

We begin this month's issue of the Journal with 2 papers related to outcomes for patients after tracheostomy. With the recent tendency towards earlier tracheostomy in patients receiving mechanical ventilation, this is an important topic. Hernández et al studied how the tracheostomy tube remaining in place after intensive-care-unit (ICU) discharge affected hospital mortality. Ward mortality was 26% in patients with the tracheostomy tube in place. The 3 factors associated with ward mortality were lack of decannulation at ICU discharge, body mass index > 30 kg/m^2, and tenacious sputum at ICU discharge. Gerber et al determined whether mortality and need for ICU readmission of patients undergoing tracheostomy can be predicted. They found that patients with a greater weight or a history of sepsis or underlying neurologic disease may be at higher risk of poor outcomes. The results of these studies suggest that there are opportunities to improve the safety and care of patients who leave the ICU with a tracheostomy. This issue is addressed in the editorial by Wilcox and Schmidt, who suggest 3 approaches to improve the care of these patients: 1) the use of decannulation protocols, 2) discharging the patient to a respiratory step-down unit rather than a general care ward, and 3) use of tracheostomy teams.

Another tracheostomy-related paper is by Stelfox et al. Little is known about how clinicians make decisions to decannulate patients, and whether respiratory therapists (RTs) and physicians make similar decisions. The authors conducted a North American survey of RT and physician tracheostomy decannulation practices. RTs were more likely to recommend decannulation for patients who demonstrated an ability to tolerate tracheostomy tube capping for 72 hours and whose etiology of respiratory failure was chronic obstructive pulmonary disease (COPD). Despite these differences, there was broad concordance among RTs and physicians regarding the decision to decannulate. As Heffner points out in his editorial, tracheostomy expertise must follow patients wherever they go in the hospital – but this rarely occurs. Similar to Wilcox and Schmidt, Heffner suggests tracheostomy teams may improve the care of the patient with a tracheostomy.

Johnston and Aziz measured the delivered fractional oxygen concentration (F_{DO_2}) from preterm-size Laerdal silicone resuscitators without a reservoir. They found that, in all tests using 5 or 10 L/min, F_{DO_2} exceeded 0.95. The lowest F_{DO_2} was 0.59 at 1 L/min. These data differ from the F_{DO_2} stated in the North American Neonatal Resuscitation Program provider manual. Unfortunately, many clinicians have been trained to believe that $F_{DO_2} > 0.5$ is not possible without a reservoir. As Salyer points out in his editorial, this is an example of the confusing nature of the conventional wisdom. Salyer goes on to address a number of other important issues related to the use of manual resuscitators in newborns.

The introduction of new nebulizer/compressor combinations raises the question of whether their performance is similar to existing devices. Berg and Picard determined the inhaled mass and aerosol characteristics of budesonide inhalation suspension from a selection of jet-nebulizer/compressor combinations presently marketed. Specifically, they evaluated in vitro delivery of budesonide from 30 jet nebulizer/compressor combinations using infant and child breathing patterns. Delivery characteristics differed considerably between the 30 nebulizer/compressor combinations. The mass median aerodynamic diameter of the aerosol ranged between 4.8 microns and 9.9 microns. The inhaled mass of budesonide expressed as a percentage of the nebulizer charge ranged from 1% to 9% in the infant model and from 4% to 20% in the child model. As the authors correctly state, further investigations of new nebulizer/compressor combinations are warranted.

Agarwal et al conducted a study to determine the outcomes of noninvasive ventilation (NIV) and the factors associated with NIV failure in patients with acute hypoxemic respiratory failure. Consistent with other studies, they report a high failure rate for NIV in this patient population. A lower P_{aO_2}/F_{IO_2} ratio was associated with NIV failure. Their conclusion that NIV should be judiciously used in patients with hypoxemic respiratory failure is prudent.

Despite progress in this area in recent years, attention to nutritional support is frequently neglected in a busy intensive care unit (ICU). Singh et al assessed the adequacy of nutritional support administered to patients requiring mechanical ventilation in the respiratory ICU of a tertiary-care hospital and its correlation with outcomes. They report that calorie and protein delivery to critically ill patients was less than the recommended values. Although this was a single center study from India, many other ICUs around the world would most likely report similar results. Their finding that inadequate calorie delivery was associated with higher odds of mortality should serve as a reminder to all of us to consider the importance of nutritional support in the ICU.

The value of automatic tube compensation (ATC) is a matter of some debate. Aggarwal et al evaluated the combination of pressure-support ventilation (PSV) and ATC in weaning patients receiving mechanical ventilation. They report that the addition of ATC with PSV shortened the weaning phase by an average of 8 h, compared with PSV alone. However, the duration of time on the ventilator and time in the ICU were not different between patients who received ATC and those who did not. It is also unclear whether the patients required weaning at all. At the point where the patients were switched to PSV, perhaps a T-piece trial would have been successful without PSV weaning. The authors are correct in recommending that more clinical trials are needed to clarify the role of ATC.

Measurements of chest wall circumference are used by physical therapists to determine chest wall mobility. However, variability in the methods used to obtain such measurements has not been reported in patients with COPD. Malaguti et al analyzed the reliability and accuracy of chest wall mobility measurements and investigated the association between chest wall mobility and inspiratory capacity. They found that high variability was observed in all chest wall mobility measurements. Although there was an association between inspiratory capacity and measurements made at the abdominal level, chest wall mobility did not infer pulmonary function.

The 6-minute-walk test is widely used for functional evaluation of patients with COPD. However, the test requires a 30 m unobstructed hallway, which is not available in all institutions. Almeida et al compared the results of hallway versus treadmill 6-minute-walk tests in patients with moderate to very severe COPD. They found that the mean hallway walk distance was significantly greater than the mean treadmill walk distance and correctly conclude that the hallway and treadmill walk tests are not interchangeable.

Hayes and Kraman review the physiologic basis of spirometry. This month's case report, by MacDonald et al, relates to primary snoring and growth failure in a patient with cystic fibrosis. The Teaching Case of the Month, by Sáncho-Chust et al, is a case of pulmonary tumor embolism as an initial manifestation of pancreatic adenocarcinoma.