Prevention of ventilator-associated pneumonia (VAP) has received much attention in recent years. Arroliga et al report the incidence of VAP in their hospital in 2008, and again in 2009 after adjustment in the process by oral care performed by respiratory therapists. There was a reduction in the incidence of VAP with an intervention that included respiratory therapists doing oral care in patients receiving invasive mechanical ventilation. The authors thus conclude that oral care done by respiratory therapists may be associated with a reduction of VAP. As Sandrock points out in his editorial, this study highlights the importance of a multidisciplinary approach with a team working together towards a common goal to improve patient outcomes. It also highlights the role that respiratory therapists play in VAP prevention.

Automatic tube compensation (ATC) is used to overcome the flow-dependent resistive work load of the endotracheal tube. However, resistance through the endotracheal tube can be increased by tracheal secretions or tube deformities. Oto et al evaluated the effect of ATC using endotracheal tubes from critically ill patients requiring mechanical ventilation for longer than 48 hours. They found that tube configuration changes and tracheal secretions can increase resistance and decrease the ability of ATC to compensate for the increased respiratory work load. These results are consistent with the findings from other studies, which suggest that ATC might improve the tolerance of a spontaneous breathing trial. As L’Her writes in his editorial, ATC is safe, but its use remains controversial.

Although noninvasive ventilation (NIV) is increasingly utilized outside the ICU for patients with acute respiratory failure, success and failure risk factors, and patient safety aspects have been poorly explored in this setting. Cabrini et al evaluated the perspective of the patient to use of NIV outside the ICU. Subjects reported a low level of involvement in the initial setting of NIV treatment, a low satisfaction about communication with the caring staff, and a suboptimal safety level in case of emergency. In their editorial, Kacmarek and Villar state the importance of careful patient selection for application of NIV outside the ICU.

Kacmarek et al surveyed directors of respiratory therapy departments regarding the future education and credentialing of respiratory care students and staff. There was good agreement that graduate and practicing therapists should obtain the vast majority of the competencies surveyed and that the entry level credential should be the RRT. Similar numbers of managers favored an entry level bachelor’s degree as favored an associate degree. These findings are important in the context of 2015 and Beyond conferences sponsored by the American Association for Respiratory Care.

The mechanism of high-flow oxygen therapy and the pressures reached in the airway have not been defined. The objective of the study by Urbano et al was to analyze the pressure generated by a high-flow oxygen therapy system in an experimental model of the pediatric airway in an experimental in vitro model. High-flow oxygen therapy systems only produced a low-level of CPAP in the experimental pediatric model, even with the use of very high flows. Linear regression analyses showed similar relationships between flow and pressures measured in the pharynx and in the airway. The maximum pressure recorded was 4 cm H2O with a flow of 20 L/min. When the mouth of the manikin was held open, however, the pressures in the airway and pharynx were undetectable.

The functional status and outcomes in patients with prolonged mechanical ventilation (PMV) are often limited by poor endurance and pulmonary mechanics, which result from the primary diseases or prolonged time bedridden. Chen et al evaluated the impact of exercise training on pulmonary mechanics, physical functional status, and hospitalization outcomes in patients receiving PMV. They found that subjects with PMV in their respiratory care center demonstrated significant improvement in pulmonary mechanics and functional status after exercise training.

Despite potential benefits of intrapulmonary percussive ventilation (IPV) in various respiratory diseases, the impact of setting parameters on the mechanical effects produced by IPV in the lungs is unknown. To address this, Toussaint et al compared the intrapulmonary effects resulting from changes in parameters in 3 portable IPV devices using a lung model. They found that changing the parameters considerably modulates the mechanical effects produced by portable IPV devices in the lungs. Increasing frequency increased PEEP and percussion, but decreased ventilation. Increasing inspiratory to expiratory time increased PEEP and expiratory to inspiratory flow ratio, and decreased percussion. Increasing pressure increased PEEP and ventilation.

The aim of the study by Redondo et al was to determine factors predicting failure in the use of NIV (specifically, CPAP) with a helmet in patients with acute postoperative respiratory failure. They found that NIV using a helmet could provide an effective alternative to conventional ventilation in selected patients with postoperative acute respiratory failure. The 3 risk factors associated with NIV failure were ARDS, pneumonia, and lack of improvement in PaO2/FIO2 within 1 hour of NIV initiation.

A negative sputum smear from a patient with history, physical examination, and chest x-ray findings suggestive of tuberculosis (TB) presents a diagnostic dilemma. Yang et al investigated the possible factors associated with a misdiagnosis and inappropriate treatment of TB among such patients. They found that an incorrect diagnosis of TB despite a negative sputum smear result is more likely to be made for patients positive for nontuberculous mycobacteria culture and less likely for patients with positive M. tuberculosis culture.

Lee et al explored the association between polymorphisms in the human diffuse panbronchiolitis critical region 1 (DPCR1) gene and aspirin-exacerbated respiratory disease (AERD), an asthma phenotype. They found that polymorphisms in DPCR1 are not associated with the risk of aspirin-exacerbated respiratory disease in Korean asthmatics.

This month we publish reviews on the ICU follow-up clinic and chest ultrasonography in the ICU. We publish a clinical practice guideline on humidification during invasive and noninvasive mechanical ventilation. Our case reports are on the expectant management of pneumothorax in preterm infants receiving assisted ventilation, use of an endoscopy face mask in patients with gastric distension undergoing noninvasive ventilation for acute respiratory failure, high-frequency oscillatory ventilation for rescue from refractory hypoxemia in a patient with transfusion-related acute lung injury, and an in-patient model for positive airway pressure desensitization. Our teaching case is of a longstanding tracheobronchial foreign body in an adult.