In our Editor's Choice paper, Krawiec and colleagues address the challenges with implementation of a RT-driven protocol of spontaneous breathing trials (SBT) in the pediatric ICU. An RT-driven protocol was successfully introduced in an academic pediatric ICU. However, it did not impact time of SBT initiation, potentially due to the difficulty in maintaining protocol. The authors concluded that the use of an RT-driven protocol requires further study. Hartmann and DiBlasi suggest that, for the majority of intubated patients, a standardized protocol could balance the risks of premature extubation with the risks of a protracted ventilator course. However, the use of SBTs in the pediatric ICU is but one small component of a comprehensive ventilator liberation protocol.

Kallet et al evaluated the impact of ARDS etiology on dead-space fraction (V_D/V_T). They also determined whether ARDS severity as classified by the Berlin definition corresponded with changes in V_D/V_T. They found that V_D/V_T magnitude varied by ARDS etiology, as did mortality. Only in mild ARDS did V_D/V_T fail to distinguish non-survivors from survivors. Nonetheless, V_D/V_T had the strongest association with mortality risk in those with ARDS. In their editorial, López-Aguilar et al point out that this study represents a step forward in establishing the clinical utility of V_D/V_T, showing that this parameter can potentially be used to personalize care for mechanically ventilated patients.

The purpose of the study by Hammond et al was to examine current oxygenation index (OI) data and outcomes using electronic medical records to identify specific OI values associated with mortality. They found that limitations existed in obtaining serial OI values from current medical records. Serial assessment of OI values may allow creation of alert values for increased mortality risk. Consideration for escalation of therapies for respiratory failure at a lower OI than historically reported may be warranted. Dallefeld and colleagues remind us that, despite the challenges that exist in developing large sample sizes, we should remember when conducting analyses of pediatric mortality that there is strength in numbers. This underscores the importance of collaboration among centers to obtain adequate sample sizes to improve the clinical utility of studies in pediatric critical care medicine.

The aim of the study by Enrichi et al was to assess which clinical parameters were the best predictors for decannulation in subjects with acquired brain injury. Their results suggest that the best clinical prediction rule for decannulation in acquired brain injury is a combination of tracheostomy tube capping, endoscopic assessment of airway patency, and swallowing assessment.

Different strategies for clinical management of airway pressure release ventilation (APRV) have been described, but are largely based on physiologic concepts, animal data, and small observational trials. The purpose of the study by Miller and colleagues was to determine how APRV is currently managed by surveying practicing RTs with experience using APRV. The results of this survey suggest that there is only limited consensus amongst practitioners for initial APRV settings, likely reflecting the paucity of good clinical outcome data and confusion surrounding the physiology of this mode.

Neuralgic amyotrophy is an inflammatory peripheral nerve disorder in which phrenic nerve involvement can lead to diaphragm paralysis. The prevalence, magnitude and time course of diaphragm recovery are uncertain. The study by Rice and colleagues modeled the course of recovery of lung function in 16 subjects with diaphragm impairment from neuralgic amyotrophy. They found that 69% of subjects experienced recovery of lung function and diaphragm strength, but recovery was slow, and may be incomplete.

Gabriel et al performed a focused study on the association of preoperative functional status with that of unplanned intubation outcomes in subjects following thyroidectomy. Preoperative functional status was a good marker for identifying subjects at risk for re-intubation post-thyroidectomy and parathyroidectomy. These results have important implications for the care of these patients.

Galiatsatos et al retrospectively evaluated subjects discharged from a long-term chronic ventilator unit from 2010-2012. Subjects discharged from a long-term chronic ventilator unit and who were alive at 1 year had shorter stays in the ICU and were more likely to be discharged home. Further attention is warranted to assure the survival of critically ill patients once they are discharged from the ICU.

Airway clearance techniques are an important aspect of the care of patients with bronchiectasis. Silva and colleagues compared the Flutter and the Lung Flute in adult subjects with stable non-cystic fibrosis bronchiectasis, who expectorated more than 25 mL/day. Both devices were well tolerated and successfully augmented secretion clearance. Most subjects preferred the Flutter because of increased speed of secretion clearance and ease of use.

The objective of the study by Gass et al was to evaluate the effects of two intensities of expiratory positive airway pressure (EPAP) during exercise on tolerance, dynamic hyperinflation, and dyspnea in subjects with moderate to very severe COPD. The application of EPAP at 5 cm H_2O or EPAP at 10 cm H_2O during exercise caused a progressive reduction in exercise tolerance in COPD subjects without improvement in exercise dyspnea and dynamic hyperinflation at equivalent exercise duration.

The use of noninvasive ventilation (NIV) in patients with acute hypoxemic respiratory failure due to influenza infection is controversial. The aim of the study by Rodriguez et al was to identify subjects with risk factors for NIV failure and to determine if NIV failure was associated with ICU mortality. NIV failed in 57% of subjects. SOFA score was the variable most associated with NIV failure. ICU mortality was higher in subjects with NIV failure (38%) compared to invasively ventilated subjects (31%). NIV failure was associated with an odds ratio of 11 for increased ICU mortality.

This month we publish an invited review on tracheal tube design and ventilator-associated pneumonia, and a narrative review on variation in the definition of prolonged mechanical ventilation. We also publish 2 papers from the 2016 New Horizons Symposium. The first relates to the toxic effects and potential therapeutic benefits associated with inhaled carbon monoxide. The second relates to aerosol delivery during mechanical ventilation. We are also pleased to publish the OPEN FORUM abstracts that will be presented in Indianapolis.