

This month's Editor's Choice is a retrospective evaluation of the impact of organ dysfunction at the onset of ARDS on severity and outcomes. The study examined 15 years of quality assurance data on the use of lung-protective ventilation in ARDS. Kallet and colleagues report that non-pulmonary organ dysfunction was present in at least one system at ARDS onset and increased with severity. They concluded that non-pulmonary organ dysfunction is present at ARDS onset in most patients and is more pronounced as ARDS severity increases. In an accompanying editorial, Siuba and Duggal suggest that data regarding organ failure at the diagnosis of ARDS may allow therapies aimed at modifying outcomes. Since organ failure severity and number are associated with mortality, this would appear an ideal time to attempt early interventions.

Karashima et al evaluated the variation in albuterol delivery during intrapulmonary percussive ventilation in a lung model. They found that albuterol delivery increased almost two-fold with decreasing percussion frequency. Decreasing percussion frequency also increased the tidal volume (V_T), and albuterol delivery was correlated with increased V_T . Increased airway resistance reduced albuterol delivery whereas changing compliance had no significant impact. Increasing the operating pressure increased albuterol delivery and increased peak inspiratory pressure. This may occur simply due to the increase in V_T . Berlinski opines that the lack of monitoring and performance of intrapulmonary percussive ventilation might place patients at risk for barotrauma a significant risk given the device's poor aerosol delivery characteristics.

Mortamet and co-workers evaluated work of breathing (WOB) indices during a spontaneous breathing trial (SBT) in children. Using oxygen consumption (\dot{V}_{O_2}), esophageal pressure (P_{es}), and electrical activity of the diaphragm (EA_{di}) they found that the small increase in WOB during an SBT resulted in a non-significant increase in EA_{di} and P_{es} . They also reported that changes in \dot{V}_{O_2} were insensitive to these slight increases in work. Smallwood suggests this work highlights the lack of sensitivity of \dot{V}_{O_2} in assessing changes in respiratory work. Additionally, he believes this topic requires further scrutiny with regard to using variables to determine successful ventilator liberation.

Ultrasound of the lung and diaphragm is an exciting new monitoring tool in the ICU. Zhou and others used lung ultrasound and measures of procalcitonin to diagnose ventilator-associated pneumonia (VAP). They found that positive findings on lung ultrasound (eg, consolidation) and a procalcitonin >0.25 ng/mL diagnosed VAP at a sensitivity and specificity of over 80%. This preliminary evidence suggest the use of ultrasound might be helpful in evaluating VAP.

The Journal has published a number of studies regarding home mechanical ventilation around the world. In this issue, Kim et al evaluate the use of home mechanical ventilation in South Korea. Using insurance data, the authors reported that nearly 5,000 patients were ventilated at home, a prevalence of 9.3/100,000 individuals. Neuromuscular disease was the most common diagnosis with half of these patients receiving non-invasive ventilation.

Morris and colleagues report on their pulmonary function testing of military members deployed to Southwest Asia. Respiratory health may be impacted by burn pit emissions, chemical and dust exposures, as well as tobacco use. Over a 3-y period they compared pre- and post-deployment spirometry from over 800 service members. Post-deployment testing with spirometry and impulse oscillometry was unable to detect any

significant changes. They conclude that using spirometry did not identify individuals with post-deployment lung disease and that routine use is not warranted in the absence of pulmonary symptoms.

Onodera et al evaluated contamination of high-flow nasal cannula and oxygen delivery tubing in a group of individuals in the ICU. In 31 devices, they found contamination of the surface of the cannula in 5 subjects. This level of contamination after 48 h is likely from the patient and the importance of these findings is unclear. The frequency at which circuits are changed requires further study.

Luzarraga and others evaluated a mindfulness-based intervention on physical and emotional stress in respiratory therapists. They found that mindfulness interventions were feasible and could be used in the work environment. The impact of these techniques on health and well-being needs additional evidence.

Measuring breathing frequency is a common practice in pulmonary medicine. Takayama et al studied methods for counting breathing frequency for accuracy. They evaluated a count for 15 s, 60 s, and the breathing time measurement in a group of normal individuals. The reported that breathing time measurement was closer to frequency measured for 60 s than the frequency counted for 15 s and multiplied by four.

In another study of ultrasound, Eltrabili and others used ultrasound to predict ventilator liberation in septic subjects. While this was a small study ($N=30$), they demonstrated that diaphragmatic ultrasound indices could be useful parameters for assessment of successful ventilator liberation.

Andreati et al evaluated reduced FEV_1/FVC and FEV_1 as a normal physiologic variant in normal subjects, subjects with asthma, and subjects with COPD. The data suggested that a reduced FEV_1/FVC ratio may be a normal finding in younger-to-middle age male subjects unrelated to lung disease.

Kaminsky and Jarzembowski evaluated the impact of mouth pressure on the measurement of diffusing capacity in a group of 336 subjects presenting for pulmonary function testing. The median mouth pressure was 4.5 cm H₂O with a range of -13 to 31 cm H₂O. Their analysis failed to demonstrate any impact of mouth pressure on diffusing capacity.

Longhini and co-workers evaluated the use of neurally-adjusted ventilatory assist (NAVA) in subjects with COPD using a helmet interface. They compared short trials (30 min) of NAVA to traditional pressure support at similar delivered tidal volumes. They concluded that NAVA via the helmet improved comfort, trigger performance, and patient-ventilator synchrony compared to traditional pressure support.

Eltorai et al contribute another study of incentive spirometry (IS) in this issue. They found that visual obstruction of the flow indicator resulted in increased inspiratory volumes. The authors concluded that since achieving target inspiratory volumes is the most important factor in successful IS, their findings may allow for improved IS protocols, patient education, and alterations in device design.

Stephens and colleagues provide an invited review of mechanical ventilation in prehospital care and in the emergency department. The authors have published extensively on this topic demonstrating that ventilator-induced lung injury can occur early and lung protective practices need to begin early. Roberts contributes a 2018 Year in Review of the important papers on invasive mechanical ventilation in adults over the last 12 months.