

This Month's Editor's Choice evaluates inhaled sedation in mechanically ventilated subjects with COVID-19. In a retrospective cohort study Gómez Duque et al compared intravenous (IV) sedation to inhaled sedation using the need for high-dose opioids ( $\geq 200 \mu\text{g/h}$ ), opioid analgesia, midazolam, need for muscle relaxants, and risk of delirium as endpoints. Of 283 subjects, 230 were administered IV sedation and 53 received inhaled sedation. They found that inhaled sedation was associated with lower doses of opioids, benzodiazepines, and muscle relaxants. An accompanying editorial by de Lima and colleagues reviews the promise and technical issues related to inhaled sedation.

Miller and colleagues evaluated a quality improvement project of an extubation readiness test (ERT) association with time to first extubation and re-intubation rate in 320 children following cardiac surgery. The new ERT used a fixed pressure support (PS) of 5 cm H<sub>2</sub>O while the previous ERT allowed a variable PS up to 10 cm H<sub>2</sub>O. The fixed PS group demonstrated a longer time to first extubation but no change in re-intubation rate. Confounding variables in the fixed PS group included a greater incidence of cardiac arrest and higher level of post-extubation respiratory support. After multivariable regression, there were no differences in time to first extubation or extubation failure. Wakeham provides accompanying opinion noting 57% of subjects were not extubated after a first spontaneous breathing trial and advocates for larger, multi-center prospective trials.

Kallet and co-workers describe a risk stratification tool and volume-based cuff leak test (CLT) with a volume cut point of  $\geq 110$  mL to assess post-extubation stridor (PES) in adults. In 681 subjects, true positives were identified in 15% of cases. They found that a CLT leak volume  $\geq 110$  mL was associated with a PES risk of  $\sim 6\%$  whereas the risk of PES was 7 times greater when the leak volume was  $< 110$  mL. Meier and Schmidt provide an accompanying editorial noting that it is unlikely that a single test will replace expert clinical assessment. However, given its excellent negative predictive value, CLT may be a useful tool to help expedite safe extubation.

Goulart et al evaluated the impact of adding noninvasive ventilation (NIV) to high intensity exercise in subjects with COPD and heart failure. On separate days subjects performed incremental cardiopulmonary exercise testing and 3 constant load tests. Infrared spectroscopy was used to measure oxyhemoglobin and deoxyhemoglobin in the peripheral and respiratory musculature. They concluded that NIV as an adjunct to high intensity exercise resulted in unloading of the respiratory muscles and improved distribution of blood flow.

Ohtsuka and colleagues evaluated the effectiveness of single inhaler triple therapy (SITT) in COPD subjects. Pulmonary function studies were performed before and after one-month of SITT. Two drug combinations were studied, fluticasone-furoate/umeclidinium/vilanterol (F/U/V) and budesonide/glycopyrronium/formoterol (B/G/F). They found that SITT significantly improved spirometry when compared to pre-intervention and that F/U/V was more effective in subjects with severe symptoms, while B/G/F was more effective in subjects with mild symptoms.

Kondo and others performed an in vitro comparison of two blister type inhalers (Ellipta and Diskus) measuring the particle release volume and peak inspiratory flow of each. They found that Ellipta required lower inspiratory flows than Diskus and may be preferable for patients with impaired pulmonary function.

Petilli Zopelari et al performed an observational cross-sectional study using teleconferencing 30 days after discharge in subjects hospitalized with COVID-19. Subjects were assessed and performed a simulated activities of daily living (ADL). S<sub>pO<sub>2</sub></sub>, fatigue, and dyspnea were monitored at the end of each ADL. They report that S<sub>pO<sub>2</sub></sub> was similar among the ADLs but walking triggered desaturation in the most subjects. Persistence of symptoms following COVID-19 infection was independent of hypoxemia during exercise.

Imamura and colleagues retrospectively reviewed subjects with chronic fibrosing interstitial pneumonia (CFIP) to determine the impact of desaturation during the 6-min walk test (6MWT) on mortality. Compared with mild CFIP subjects, severe CFIP subjects had significantly larger change in S<sub>pO<sub>2</sub></sub> as well as longer S<sub>pO<sub>2</sub></sub> reduction time and recovery time. They concluded that dynamic changes in S<sub>pO<sub>2</sub></sub> and heart rate during 6MWT were associated with an increased risk for exacerbation and mortality in subjects with CFIP.

Moreno Giraldo and others performed a cross sectional diagnostic study in 765 subjects referred for spirometry. They compared the reproducibility and accuracy of the proposed measures against FEV<sub>1</sub>/FVC post-bronchodilator  $< 0.70$  and evaluated the proportion of respiratory symptoms for FEV<sub>1</sub>/FVC and FEV<sub>1</sub>/FEV<sub>6</sub> ratios and the peak expiratory flow (PEF) slope. They reported that FEV<sub>1</sub>/FEV<sub>6</sub> ratio, PEF slope, and 50% FVC slope had very similar diagnostic performances as FEV<sub>1</sub>/FVC.

Loberger et al retrospectively evaluated pediatric extubation failure resulting from airway and non-airway complications. The extubation failure rate was 10% over a period of 3 years. Failures related to the airway were 61% of cases. The most common airway failure was airway obstruction. They concluded that extubation failure in pediatrics was 1.5 times greater for airway failure.

Medeiros and colleagues evaluated 3 anesthesia ventilators and 2 ICU ventilators in a neonatal lung model. The model used variable respiratory mechanics and degrees of leak. They found significant differences in performance with each device.

Malin and others performed a quality improvement initiative to reduce screening chest radiographs in the ICU. The number of radiographs was reduced in part by eliminating unnecessary daily screening. Over the study period, daily chest radiographs were reduced by 34% corresponding to \$250,000 annual cost savings.

Heldeweg and others evaluated an extended lung ultrasound score (LUS) to monitor subjects with COVID-19, comparing 6- and 12-zone LUS. Using 130 ultrasound examinations in 40 subjects, the concise LUS was as informative as the extended LUS. They note that clinicians should be aware that LUS alterations may result from position changes rather than changes in disease pattern.

Zafar et al provide a short report of the use of a positive expiratory pressure device for COPD subjects experiencing dyspnea during exertion. Golpe et al describe the relationship of nocturnal dyspnea during COPD exacerbations on the associated mortality risk in COPD.

Chatburn and Liu contribute a narrative review on the evolution of intermittent mandatory ventilation and Inokuchi et al provide a systematic review of post-extubation complications between negative and positive pressure extubation.