

This month's Editor's Choice is a randomized controlled trial of a closed suction system with an integrated endotracheal tube (ETT) scraping catheter by Kaur et al. The authors randomized subjects to standard closed suctioning or closed suctioning with an integral tube scraping catheter. The study objective was to evaluate the addition of ETT scraping on the duration of mechanical ventilation, time to first successful spontaneous breathing trial, hospital length of stay, and number of ventilator-associated events (VAE). In a sample of 272 subjects there were no differences in study outcomes. They concluded that routine ETT scraping had no impact. Piccuito and Berra concur in an accompanying editorial, noting that ETT scraping might be useful in suspected ETT narrowing or occlusion. They also note that the study was underpowered to detect differences in VAE occurrence.

Miller and others report the findings of a feasibility trial evaluating outcomes of intubations by respiratory therapists (RTs). This prospective study evaluated 689 intubation events where the success rate was 98% overall and 86% on first attempts. They found that video laryngoscopy was used in two-thirds of initial attempts and was associated with higher first attempt success. Adverse airway-related events were seen in 9% of cases and arterial oxygen desaturation was seen in 11%. They concluded that intubations by RTs had a high success rate comparable to other providers. Koonce and Austin provide accompanying commentary, suggesting that the 'turf war' over intubation should be settled. Both authors are certified registered nurse anesthetists and advocate for a best practice approach that is monitored for quality of care irrespective of the initials behind the laryngoscopist's name. They remind us that airway experts must also continue to maintain their competency with guidelines and continued education.

Støve and colleagues evaluated the measurement of S_{pO_2} using a traditional oximeter and two wearable over-the-counter watches. They compared S_{pO_2} readings following routine pulmonary rehabilitation exercise in 36 subjects with COPD. Limits of agreement showed significant measurement variance and a tendency for the devices to be more inaccurate at lower saturation levels. They concluded that wearable devices should not be used to monitor oxygen saturation during pulmonary rehabilitation. Scott provides an editorial which notes that the ideal study would compare the wearable oximeters to arterial blood co-oximetry, but the invasive nature might reduce subject willingness to participate. He holds out hope for the promise of wearable devices to assist patients in managing their respiratory disease remotely.

Fazio et al evaluated the work of breathing (WOB) during proportional assist ventilation (PAV) to predict extubation failure. This prospective trial evaluated 61 subjects who passed a spontaneous breathing trial and were judged ready for extubation by the ICU team. Extubation failure occurred in 10% of subjects, with half of subjects requiring additional respiratory support post-extubation. Total WOB was significantly greater in subjects who failed extubation. They concluded that the discriminative performance of a PAV-derived total WOB value to predict extubation failure was good, indicating total WOB may be used to assess extubation readiness.

Correia et al evaluated the minimal detectable difference (MDD) of the simplified functional upper extremity function test (UEF_S) in adults with asthma and COPD. They evaluated intrarater reproducibility, validation, MDD and learning effect of the UEF_S functional test, and to characterize its performance. They compared data in 84 subjects and matched normal volunteers.

They found that the UEF_S was valid and reproducible while also being simple, quick and inexpensive.

Okazaki and others retrospectively analyzed subjects with COVID-19 receiving high-flow nasal cannula (HFNC) following extubation over a 2-year time frame. They evaluated the predictive accuracy of the ROX index at 0, 1, and 2 h for re-intubation until ICU discharge, and compared the area under the receiver operating characteristic curve for the ROX index with breathing frequency (f) and S_{pO_2}/F_{IO_2} . In 248 subjects, 44 received HFNC and 12 were reintubated. They found a $ROX < 7.44$ was associated with a higher risk of reintubation.

Hoshino et al retrospectively evaluated the factors associated with prolonged mechanical ventilation in 170 subjects with COVID-19 who received muscle relaxants and prone positioning. They stratified subjects based on ventilator free days (VFD) with < 18 VFDs defining prolonged mechanical ventilation. Overall mortality rate was 11% and persistent viral shedding in blood, high corticosteroid dose, slow recovery of lymphocyte counts, and high levels of fibrinogen degradation products after admission were associated with prolonged mechanical ventilation.

Fresnel et al performed a bench evaluation to assess triggering capabilities of noninvasive ventilation (NIV) and CPAP devices used in pediatrics. They varied tidal volume (V_T) until a minimum V_T was detected by each device. The minimum V_T ranged from 16–84 mL. They concluded that some level I and II devices might be suitable for infants.

Christensen and Schmidt performed a qualitative study of virtual consultation in 20 subjects receiving oxygen therapy at home to identify reasons for missed visits. Three main themes defined subject response; limitations and vulnerabilities, independence and quality of life, and personal strategies. Subjects demonstrated the belief that virtual consultation was a valuable endeavor.

Wakefield and colleagues retrospectively evaluated cross sectional diaphragmatic area (CSA) in 14 subjects undergoing prolonged mechanical ventilation using computed tomography. They concluded that serial analysis of respiratory muscle CSA through CT chest scans can be used to assess respiratory muscle atrophy in ventilated subjects.

Willis and colleagues report the results of a survey regarding research in respiratory care. The survey was posted online and 82 were returned. Half of respondents reported research training at the graduate level. They found the primary barriers for RTs conducting research were lack of secured time for research, opportunities to participate, training, departmental support, and mentorship. They suggest addressing these issues to promote research in the profession.

Leemans and colleagues contribute a short report describing the 3D printing of a reusable heat and moisture exchanger for patients with a tracheostomy or post-laryngoscopy. The authors developed this technology during COVID-19 shortages. Hansen-Flaschen and Ackrivo contribute a narrative review on the use of NIV in the treatment of neuromuscular disease. The authors provide practical advice on interfaces, devices, and monitoring.

Wheeler and Bullock provide a Year in Review on extracorporeal membrane oxygenation. They review the literature surrounding the management of mechanical ventilation, prone positioning, anticoagulation, bleeding complications, and neurologic outcomes for subjects undergoing ECMO published in 2022.

As part of our symposium, *Research and Publication in Respiratory Care*, Hess provides an overview of the research process, Miller provides a primer on how to initiate the research process, and Willis reviews how to formulate a research question.