

This month's Editor's Choice is a report of implementation of a respiratory therapist (RT) driven protocol to improve adherence to lung protective ventilation. Berg and colleagues implemented a protocol in all adult ICUs of an academic medical center. The protocol targeted low tidal volume, appropriate PEEP, normoxia, head of bed elevation, and prevention of tachypnea. They determined adherence to lung protective guidelines and clinical outcomes retrospectively in subjects ventilated for > 24 h. They included 666 subjects, 2/3 of whom were in the pre intervention group and 1/3 of whom were in the lung protection group. They found a significant increase in adherence to lung protective ventilation with an adjusted odds ratio of 2.48. Fewer subjects were diagnosed with ARDS, however there were no differences in the incidence of ventilator-associated pneumonia, ventilator-free days at day 28, or ICU mortality. Rich Kallet provides commentary noting that greater autonomy for RTs at the bedside has consistently demonstrated improved adherence with guidelines. He cautions that autonomy can lead to a reduction in team communication and states that even in instances of increased autonomy collaborative care is critical.

Bouchard and coworkers implemented an automated O<sub>2</sub> titration system in a tertiary care hospital. Healthcare teams were educated and trained regarding O<sub>2</sub> therapy and use of the automated O<sub>2</sub> titration device. They retrospectively reviewed data from 609 subjects who used the automated system for a median of 3 days. In a small percentage of subjects with complete data, the automated system maintained the S<sub>pO<sub>2</sub></sub> target 89% of the time. They concluded that automated O<sub>2</sub> titration could be successfully implemented in hospitalized patients with hypoxic respiratory failure. O'Driscoll and Kirton provide commentary considering advantages and potential disadvantages of automated O<sub>2</sub> titration. They suggest this promising technology faces a number of regulatory hurdles, and that initial introduction might be reserved for specific groups where the evidence is currently the most robust.

Karashimi and others report the results of a bench evaluation of albuterol delivery using intrapulmonary percussive ventilation (IPV) during mechanical ventilation. They varied lung model settings at constant ventilator settings. Nebulized albuterol was collected on a filter and quantitated with spectrophotometry. Overall, they found very little albuterol delivered to the lung model and changes in IPV settings did not significantly improve drug delivery. Berlinski provides an accompanying editorial. He notes that a number of studies have shown very poor aerosol delivery with IPV and similar devices. He also notes there is little evidence at all for use of IPV. If IPV is used, Berlinski suggests aerosol delivery before IPV treatment using a standard aerosol delivery device.

Schaeffer et al retrospectively evaluated 260 adults hospitalized for an exacerbation of COPD receiving HFNC or noninvasive ventilation (NIV). They calculated ROX index scores at initiation of treatment and at predefined intervals. They reported that 18% of subjects required invasive ventilation or died while on HFNC or NIV. The optimal cutoff value for sensitivity and specificity was a ROX score greater than 6.88, higher than the typical score of 4.88.

Goh and others describe implementation of a high risk extubation readiness test (ERT) protocol in pediatric cardiac subjects. They compared a standard risk ERT protocol using pressure support and PEEP to a high risk ERT protocol using PEEP alone. The primary outcome was a composite of extubation failure and the need for rescue noninvasive

respiratory support. They found that the high risk ERT protocol resulted in improvement in peri-extubation outcomes. Using logistic regression, the composite outcome was improved using the high risk ERT protocol.

Di Maria and others performed a retrospective analysis of subjects with spinal cord injury in a rehabilitation center and specialized sleep unit. Subjective questionnaires and objective data including polysomnography were collected and analyzed. They found the questionnaires to be of limited use, but the oxygen desaturation index measured by oximetry performed well as a screening test for sleep apnea.

Topcuoğlu et al compared diaphragm and accessory muscle activation during normal breathing, pursed lip breathing, and controlled breathing along with dyspnea relief positions, supine and lying on their side. They studied 16 subjects with COPD using a cross-sectional study design and found no differences in muscle activation between leaning forward and leaning forward at a table position. Muscle activation was greater in the supine position than other positions. They concluded that the use of the leaning forward and leaning forward at the table position, together with a breathing control maneuver may help reduce dyspnea more effectively.

Jabri and colleagues performed a retrospective multicenter study of subjects with severe acute respiratory infection managed with NIV and invasive ventilation. Subjects were equally distributed between invasive ventilation and NIV. Sixty percent of subjects initially on NIV required intubation. After adjustment using propensity scoring, NIV was associated with a lower 90-d mortality rate than invasive ventilation. They concluded that NIV was commonly used for severe respiratory infections and, though having a high failure rate, was associated with a lower 90-d mortality.

DiBlasi et al compared delivery efficiency, particle size, and deposition of aerosolized bronchodilators during HFNC in a bench model of neonatal, pediatric, and adult upper airway. The aerosol mass deposited in the upper airway and lung was quantified. Particle size was measured with a laser diffractometer. Regional deposition was assessed with a gamma camera. They demonstrated a wide range of aerosol delivery based on the position in the circuit and adapter. The inhaled lung dose was 1–5%. They concluded that improvements in aerosol delivery are needed to provide effective therapy for patients receiving aerosolized medications with HFNC.

Bergez and others provide a short report describing noise produced by various respiratory support techniques during neonatal transport. In this simulation study they found a number of common devices produced sounds greater than 60 dBA. They concluded that placing devices outside the incubator can reduce noise exposure.

Miller and co-workers provide a year in review describing endotracheal intubation outside the operating room. They summarize a large number of studies published in 2023 across a wide variety of settings and patient populations. Wiles provides a year in review on long-term oxygen therapy. This paper focuses on four categories: supplemental oxygen during COVID-19, telemonitoring, long-term oxygen therapy equipment, and in-home HFNC.

Jian et al provide a network meta-analysis on the effects of different exercise types in subjects with COPD. They found that high intensity interval therapy may be more effective than endurance or resistance exercise at improving 6-min walk distance. Pigmans et al provide a narrative review on personalizing masks for NIV.