

This month's Editor's Choice paper evaluates the role of respiratory therapists (RTs) in evaluation of patients with COPD in preparation for hospital discharge to home O<sub>2</sub> therapy. Tan and colleagues used an online questionnaire distributed to RTs nationwide. Of the nearly 500 respondents, 58% reported consistent evaluation of patients at rest, 43% during activity, and 14% during sleep. Midwest practice location and greater familiarity with Medicare guidelines were associated with greater odds of evaluating patients at rest and during activity. They concluded that RTs do not routinely evaluate COPD patients for home O<sub>2</sub> prior to discharge, and only a minority are involved in selecting home oxygen equipment. Mador provides an accompanying editorial suggesting lack of RT involvement may lead to suboptimal usage secondary to incomplete patient education and selection of portable oxygen devices fail to meet patient needs.

Miller and coworkers retrospectively reviewed their use of high-frequency jet ventilation (HFJV) over a 5-year period. In a small sample of 35 pediatric subjects, HFJV resulted in improved ventilation but no changes in oxygenation. Only 12 subjects remained on HFJV for >72 h; sample size was insufficient to evaluate mortality. Maxwell et al opine that the study of HFJV in pediatrics has been limited to single-center case series and requires prospective observational trials with propensity matching from other institutions.

The current pandemic has taxed ICU resources, both in personnel and material. Roberts et al explored the deployment of certified registered nurse anesthetists (CRNAs) to the ICU to assist with mechanically ventilated patients. CRNAs were trained by lead RTs in respiratory procedures and ICU ventilator operation. In a follow-up survey, they found that CRNA comfort with ICU ventilators increased only with ICU experience. The authors concluded that CRNAs' comfort level with ICU ventilators increased working alongside RTs. Austin and Burns, both seasoned CRNA educators, provide commentary detailing CRNA training and the concept of "stepping over" from the operating room to augment ICU care.

Bhalla et al retrospectively reviewed 180 ventilated pediatric subjects with acute hypoxemic respiratory failure. They recorded the end tidal alveolar dead space fraction (AVDSf) and ventilatory ratio, and used these data to predict survival. They found that ventilatory ratio could not be used for prognostic purposes, but that AVDSf was related to the severity of illness.

Prasad et al compared neurally-adjusted ventilatory assist (NAVA) with pressure support for delivering noninvasive ventilation (NIV) in consecutive subjects with respiratory failure. The study outcomes were NIV failure, 28-d mortality, and asynchrony index. They concluded that NIV-NAVA did not reduce NIV failure rates or 28-d mortality. Patient-ventilator asynchrony was reduced with NAVA.

Dianti and colleagues evaluated the impact of tidal volume (V<sub>T</sub>), driving pressure (ΔP), and mechanical power on mortality from 9 trials encompassing almost 5,000 subjects. They examined the correlation between differences in V<sub>T</sub>, ΔP, and power, and the magnitude of mortality benefit in trials of lung-protective ventilation in adults with ARDS using meta-regression. They found that V<sub>T</sub>, ΔP, elastic power, dynamic power, and driving power, exhibited similar treatment effect on mortality.

Pillay et al evaluated nitric oxide (INO) delivery via nasal cannula in a lung model. They measured simulated tracheal INO concentrations under a variety of breathing patterns and determined mass flow and INO concentration. Their data confirm previous findings that breathing pattern significantly impacts INO concentration, but the mass flow was less variable. They concluded that mass flow might be a useful dose metric for INO delivered by nasal cannula.

Morais and co-workers evaluated lung expansion techniques in bedridden comatose subjects using electrical impedance tomography (EIT). Subjects were subjected to both expiratory positive airway pressure and a breath stacking maneuver. They found that both techniques promoted short-lived increases in lung aeration with no impact on cardiovascular variables.

Burton and colleagues queried the National Surgical Quality Improvement Program (NSQIP) database to determine factors associated with 30-d re-intubation following aortic valve repair. Over a calendar year, ≈ 6,000 patients from NSQIP were evaluated. The main

factors associated with re-intubation were COPD, congestive heart failure, and bleeding disorders.

Hickmann et al evaluated the immediate impact of sitting out of bed and exercise on lung aeration in critically ill subjects using EIT and physiologic variables. Subjects included ventilated and spontaneously breathing individuals receiving passive or active exercise. Their data suggest that a sitting position and exercise increased lung aeration and improved oxygenation in the more severely hypoxemic subjects.

Kallet and Lipnick retrospectively evaluated the correlation between the ratio of end-tidal-to-arterial carbon dioxide tension (P<sub>ETCO<sub>2</sub></sub>/P<sub>aCO<sub>2</sub></sub>) and deadspace to V<sub>T</sub> ratio (V<sub>D</sub>/V<sub>T</sub>) in subjects with ARDS. They found a strong correlation between P<sub>ETCO<sub>2</sub></sub>/P<sub>aCO<sub>2</sub></sub> and V<sub>D</sub>/V<sub>T</sub> and concluded that the former could be used as a surrogate for the latter to as a simple and practical measure of ARDS severity and response to treatment.

Martinasek et al performed an observational study of carbon monoxide (CO), pulse rate, and pulse oximetry saturation (S<sub>pO<sub>2</sub></sub>) in hookah lounge patrons. They measured exhaled CO, pulse, S<sub>pO<sub>2</sub></sub>, and pulse carboxyhemoglobin (SpCO) of volunteers upon entry and exiting a hookah lounge. While there were large increases in SpCO (1.5%–10%), changes in other variables were clinically unimportant. They concluded that CO exposure in hookah smokers is important and long-term consequences require study.

Williams and others compare the attitudes of nurses (RNs) and RTs in a pediatric hospital toward addressing environmental smoke exposures during hospital stay. Using an online survey, they recorded caregiver responses related to smoking cessation discussions with family and screening for smoke exposures. Compared to pediatric RNs, RTs reported higher rates of confidence in providing cessation interventions, screening for smoke exposure, and counseling on reducing smoke exposure.

McLaren et al retrospectively reviewed the airway microbiology of hospitalized, tracheostomized children comparing tracheal aspirates to bronchoalveolar lavage (BAL) samples. In a sample of 43 subjects, *Staphylococcus aureus* and *Pseudomonas aeruginosa* were the predominate isolates. They found that negative endotracheal aspirates might be used as a screening technique, as positive BAL cultures were uncommon if aspirates were negative.

Nakato and colleagues evaluated the impact of a spontaneous breathing trial (SBT) on cardiopulmonary variables in preterm infants. During a 3-min SBT they measured pulse, S<sub>pO<sub>2</sub></sub>, breathing frequency, V<sub>T</sub>, and Silverman respiratory severity score. Retrospective review of the data demonstrated that greater instability in measured variables was associated with a fall in V<sub>T</sub> and rise in breathing frequency. They concluded that the 3-min SBT was associated with instability. Moreover, the extubation failure rate was 9%, questioning the utility of the test in this group.

Munari and others evaluated the reproducibility of the 6-min step test (6MST) in subjects with COPD. They compared two 6MSTs performed 30 min apart in 40 subjects. They concluded that performance and physiological variables were reproducible, and a second test did not impose additional physiological overload.

Cederwall and co-workers mined the Swedish Intensive Care registry to evaluate the prevalence of prolonged mechanical ventilation (PMV) and ICU occupancy of PMV subjects. In a database of >39,000 ICU admissions, 4% required PMV, but these subjects consumed 22% of ICU bed days. They concluded that PMV subjects represent a relatively small portion of ICU admissions but utilize a significant proportion of ICU bed days.

Yang et al provide a systematic review of early active mobilization in ICU subjects focusing on safety assessments. Pu and others performed a systematic review of variable corticosteroid doses on COPD exacerbations.

Kotta and Ali contribute a narrative review on the role of incentive spirometry (IS) on post-operative pulmonary complications following thoracic surgery. They concluded the data for IS remain lacking despite its continued widespread use. Orso and colleagues provide a narrative review of mechanical ventilation during mechanical compressions in subjects undergoing cardiopulmonary resuscitation. They conclude that the optimal mode of ventilation, breath type, and volume have yet to be identified.