

This month's Editor's Choice, by Cazzolli et al, evaluated the oral secretion scale (OSS) as a method for determining noninvasive ventilation (NIV) intolerance in subjects with neuromuscular disease. The study included 137 subjects followed until death or tracheostomy, over nearly a decade. The OSS evaluates an individual's ability to manage oral secretions. They reported that an OSS of 1 predicted NIV failure and the need for tracheostomy. Benditt contributes an accompanying editorial detailing the strengths and weaknesses of the study, including the long period of observation and potential for confounders introduced as physicians and practice patterns changed.

Cuccia and others evaluated drug delivery during mechanical ventilation using a breath-actuated jet nebulizer on the wet side of the humidifier. In a bench model, they evaluated drug delivery with heated humidification and a bypass heat and moisture exchanger. They found that breath-actuation provided a predictable dose regardless of ventilator settings or type of humidifier. Dhand provides some insights into the use of inhaled medications during mechanical ventilation, the type of devices, and the position in the circuit.

Zustiak and colleagues evaluated the impact of tracheostomy stoma cleaning solution on the incidence of stoma site infection in pediatric subjects. They retrospectively reviewed infection rates in subjects who used 0.25% acetic acid, sterile water, or sterile saline for twice daily tracheostomy stoma care. Reporting on 102 subjects, they found that acetic acid cleaning solutions reduced evidence of infection by a third. Volsko's accompanying editorial highlights the importance of research in tracheostomy care, a topic that has an anemic evidence base.

COVID-19 continues to challenge our medical infrastructure and overwhelm critical care units. A proposed solution for ventilator shortages has been ventilation of 2 patients with a single ventilator. In the third paper RESPIRATORY CARE has published on this subject, Kheyfets et al describe a lumped parameter computational model evaluation of shared ventilation. The model predicted tidal volume distribution within 10% of previously published data across a range of compliance and resistance settings using both volume and pressure control. They suggest that matching patients based on the PEEP/F<sub>IO<sub>2</sub></sub> table could reduce concerns related to uneven distribution of ventilation during shared ventilation.

Cavallazzi et al found that extending the time from bronchodilator administration to assessment of bronchodilator response increased the yield of spirometry for the diagnosis of asthma in older adults. They found that an additional 15% of subjects demonstrated a positive bronchodilator response. Late response was associated with older subjects with suspected asthma.

Hsia and colleagues evaluated a smartphone application based on national asthma guidelines as an educational tool to improve subjects' knowledge of the disease and treatment. Using a series of assessments at baseline and every other month up to 6 months, they reported improved asthma knowledge, reduced healthcare utilization, and improved outcomes.

Hansen et al used the Danish National Registry to evaluate the impact of comorbidities on outcomes in COPD. They evaluated comorbidity clusters in over 70,000 subjects. Eighty-one percent of subjects had a chronic comorbidity, with hypertension the most common at just less than half of subjects. Their data suggest that heart disease in COPD subjects was a prognostic factor for health vulnerability.

Martín Bote and colleagues evaluated subjects with ALS using overnight recordings of pulse oximetry to determine if nocturnal desaturation predicted adverse outcomes. Desaturation was defined as an S<sub>pO<sub>2</sub></sub> < 90%. In a group of 76 subjects, one quarter

had frequent desaturations. Subjects in the desaturation group had a higher risk of respiratory failure and poorer outcomes.

Ouchi and others evaluated the effect of manual rib cage compression on mucus clearance in a ventilated porcine model. Gas exchange, mucus clearance, and hemodynamics were determined following rib cage compression and in control animals. They concluded that manual rib cage compression and closed suctioning was safe and led to increased mucus clearance; however, there was no effect on gas exchange.

Adiyeke et al evaluated the impact of high-flow nasal cannula (HFNC) on olfactory function in subjects with respiratory failure. Subjects had olfactory function assessed before and after HFNC use. In 30 subjects they determined odor threshold, odor discrimination, odor identification, and global olfactory score. They report that subjects with acute respiratory failure had relative olfactory dysfunction compared to healthy controls. The use of HFNC to relieve hypoxemia resulted in an improvement in olfactory function.

Rogerson and colleagues evaluated healthcare resource utilization in children requiring prolonged mechanical ventilation via a tracheostomy. In a group of 50 subjects over a 2-year period, they collected data on demographics, resource utilization, and outcomes. Their findings demonstrated that subjects with neurologic diagnoses had shorter hospital lengths of stay and lower hospital costs than those with respiratory diagnoses. However, there were no difference in outcomes.

Chenault and others evaluated the ventilatory support of neonates undergoing operative procedures. Hyperventilation in neonates is associated with changes in cerebral blood flow and has potential important consequences. Hyperventilation was seen in one-third of subjects, and 13% of subjects had severe hyperventilation with P<sub>aCO<sub>2</sub></sub> < 30 mm Hg. This observational trial demonstrated frequent hyperventilation but no harm in these subjects.

Liu et al evaluated sequential application of NIV after early extubation in subjects following repair of aortic dissection. The study used a historical control followed by a treatment group receiving early extubation (in subjects who failed the first spontaneous breathing trial) and sequential NIV use. The NIV group had a reduced duration of invasive ventilation and ICU length of stay without any change in reintubation rate.

Tran and colleagues performed a retrospective cohort study to evaluate the impact of ambulatory status and disposition on outcomes in subjects following prolonged critical illness. Over a 4-year period, ambulatory subjects were five times more likely to be discharged home than subjects who never ambulated. The authors suggest that early mobility should be emphasized to improve outcomes, however severity of illness may preclude mobility.

Volpe and colleagues provide an invited review on airway clearance techniques in mechanically ventilated patients. They review strengths and weaknesses of ventilator hyperinflation, expiratory rib cage compression, a positive end-expiratory pressure-zero end-expiratory pressure maneuver, and mechanical insufflation-exsufflation techniques. Additionally, they describe the use of electrical impedance tomography to monitor regional secretion displacement, lung aeration, and regional lung mechanics.

Figueiredo et al provide a systematic review of inspiratory muscle training in COPD subjects and Martin and colleagues provide a narrative review of the impact of hyperoxia in critical illness. Finally, Gaeckle et al provide a narrative review of the impact of oral health on lung function. They describe common dental conditions and potential mechanisms by which poor oral health may contribute to lung disease