

This month's Editor's Choice is a retrospective review of outcomes in subjects ventilated for status asthmaticus over an 8-year time frame. Kashiouris and colleagues evaluated the impact of invasive ventilation and endotracheal tube (ETT) size on mortality. Invasive ventilation was used in 25% of subjects and the need for ventilation was associated with poorer outcomes. They also found that in 275 subjects who required invasive ventilation, smaller ETT size was associated with higher mortality. There were large differences in group sizes for ETT diameter with only 3.3% of subjects receiving an ETT < 7.0 mm. Gilmore contributes an accompanying editorial reviewing the impact of ETT diameter on resistance and the physiologic consequences. He also suggests that selecting ETT size in adults should be approached with the same rigor afforded neonates and pediatrics to avoid complications.

Rose and others compared the outcomes of subjects requiring prolonged mechanical ventilation in the ICU versus subjects admitted to weaning centers. This retrospective case-control study from Canada compares survival and health care costs in survivors. Over a 12-year period, 201 subjects in each group were matched by age, sex, Charlson comorbidity index, income, days in ICU and hospital. They reported no differences in the number of subjects discharged to home, but did find a lower risk of death at 12 months in subjects at a weaning center. At completion of the study, healthcare utilization and costs were higher in weaning center survivors. Rackley and MacIntyre provide an accompanying editorial suggesting that model of care is more important than site of care for patient-centered outcomes.

Eidman et al performed a retrospective chart review of pediatric subjects requiring noninvasive ventilation (NIV) requiring admission to the pediatric ICU. Subjects were stratified based on the use of dexmedetomidine versus no sedation. The primary outcome of the study was intubation within 6 h of NIV initiation. In 108 subjects, they found the use of dexmedetomidine versus no sedation effectively reduced agitation with no impact on intubation rate. They concluded that the use of dexmedetomidine may improve NIV tolerance without risk of over sedation resulting in intubation. Miller and colleagues note several limitations of the trial and the lack of a global improvement in NIV success even with sedation. They suggest that future studies should focus on specific disease states in multicenter prospective trials.

Genty et al prospectively measured diaphragm thickening fraction (DTF) and DTFmax (the higher DTF value of the two hemidiaphragms) in subjects following cardiothoracic surgery during a spontaneous breathing trial (SBT) in an effort to predict successful extubation. They studied 50 subjects receiving pressure support during an SBT compared to 39 subjects ventilated for > 48 h. They report that greater increases in DTFmax were associated with SBT failure. These investigators suggest that measurement of DTFmax during an SBT may be a useful arbiter of successful extubation.

Sorg and Chatburn report the results of a bench study evaluating F_{IO_2} using different oxygen masks, including open and closed mask designs. They compared a closed simple mask, two open mask designs, a non-rebreathing mask, and a partial non-rebreathing mask. They measured F_{IO_2} from 0.28 to

1.0. The authors concluded that no single device could serve as a substitute for all the others at flows of 1–15 L/min.

Duprez and others describe a bench study of low flow oxygen systems at varying simulated inspiratory flows, including the double trunk mask. Oxygen flows of 10–15 L/min were set and delivered to a mannequin and F_{IO_2} was measured. They found that the double trunk mask increased the delivered F_{IO_2} compared to other devices, particularly in the face of leaks around the simulated face seal.

Adzrago et al explored adult data from the 2017–2019 National Survey on Drug Use and Health to identify any links between and within sexual identity-group differences in asthma prevalence among individuals who smoke and are obese. Two-thirds of the cohort ($n = 128,319$) reported having asthma, nearly half were obese, and 10% were active smokers. They concluded that smoking and obesity were associated with heightened odds for asthma, with significant odds for sexual minorities in asthma diagnosis relative to heterosexuals. Future research should evaluate the mechanisms responsible for these associations.

Curran and others evaluated physical activity and sedentary behavior in subjects with cystic fibrosis and the relationship to health-related quality of life (HRQOL). Subjects were evaluated using an accelerometer for 7 days, spirometry, and surveys to determine well-being, sleep quality, and HRQOL. In a small sample of 33 individuals, 75% failed to reach physical activity goals and half had poor sleep quality. They found that peak oxygen consumption was strongly correlated with step count and forced expiratory volume in one second. Physical activity was correlated to aerobic capacity.

Kaslow et al evaluated the impact of a multidisciplinary clinic on access to pulmonary care and adherence to respiratory care guidelines in subjects with Duchenne muscular dystrophy (DMD). They performed a retrospective analysis of 84 subjects with DMD over a 3-year period to determine if recommended pulmonary function tests (PFTs) and polysomnography (PSGs) were performed. They found that half of subjects had prior pulmonary involvement and a third were seen in clinic within a year of symptom onset. Adherence to PFT guidelines increased and 79% of subjects completed a PSG in the previous 12 months. The authors concluded that a multi-specialty DMD clinic improved pulmonary evaluations and care.

Yuan and colleagues evaluated the effect of two patient postures and two inspiratory flow waveforms on results of the cuff leak test in mechanically ventilated subjects. Post-extubation stridor was found in 9% of subjects with 7% of subjects requiring reintubation. They found that the cuff leak test performed with the subject in a semi-recumbent position using a constant inspiratory flow was best able to predict the presence of post-extubation stridor.

Shibuya and colleagues provide a systematic review of pulmonary rehabilitation following an exacerbation of COPD. They confirmed the short-term benefits of pulmonary rehab but could not demonstrate long-term improvements. Fisher provides a Cochrane Corner on the use of positive expiratory pressure in subjects with CF.