

This month's Editor's Choice paper by Burton et al evaluates the influence of urbanicity on mortality and hospital length of stay in subjects with acute respiratory failure. This is a 'big data' study from the 2014 National Inpatient Sample database comparing subjects from rural and urban facilities. They found that the odds of inpatient mortality were significantly higher among urban hospitals, both teaching and non-teaching hospitals. Poorer outcomes in teaching hospitals is, at first blush, counterintuitive. Teaching hospitals typically have expertise and programs that smaller hospitals lack. However, urbanicity describes a population that typically has a greater severity of illness and more frequent co-morbidities as a consequence of structural inequities in society which limit access to healthcare, education, and employment while increasing exposure to pollution and violence. Ben Khallouq and Schellhammer provide an accompanying editorial which reviews the social determinants of health and provides points for consideration for respiratory therapists to advocate for changes in health inequalities.

Guarnieri and colleagues performed a retrospective review of tracheostomy and the incidence of tracheomalacia in subjects requiring mechanical ventilation for COVID-19. Over a 4-month period they evaluated 151 subjects, nearly half required tracheostomy. Tracheomalacia was seen in 8 (5%) of subjects, a rate 10 times that reported in the literature. Tracheomalacia was more common in women and in obese subjects. Fiacchini and co-workers provide accompanying commentary suggesting that prolonged mechanical ventilation, frequent use of prone position, overwhelmed staff, as well as features of COVID-19 not yet fully understood contribute to this finding.

Singh et al describe the use of tocilizumab, an anti-IL-6 therapy, in over 11,000 subjects with SARS-CoV-2 in the New York health system. This retrospective review evaluated subjects who received tocilizumab if they required low flow oxygen via nasal cannula and oxygen saturation remained < 88%. Following administration of tocilizumab, overall mortality was reduced and when administered prior to escalation of oxygen therapy it reduced the requirement for mechanical ventilation. While these retrospective data are encouraging, prospective trials are sorely needed.

Hyun and others evaluated the peak expiratory flow (PEF) during mechanical insufflation-exsufflation (MI-E) in intubated subjects and via face mask following extubation in an effort to ascertain the impact of endotracheal tube resistance. They found that PEF during intubation frequently failed to reach the desired flow of 2.7 L/s compared to face mask use. Their findings suggest that higher pressures are required to achieve sufficient PEF in intubated patients.

Nair et al performed a randomized controlled trial of high-flow nasal cannula (HFNC) and noninvasive ventilation (NIV) in subjects with COVID-19 to determine the impact on requirement for mechanical ventilation. The main outcome was intubation within 48 h. There were no differences in groups prior to randomization. This small trial of 109 subjects found no differences between techniques, although HFNC was associated with lower intubation rate at day 7.

Colaïanni-Alfonso and colleagues performed a prospective observational trial of the use of HFNC and combined HFNC/CPAP in subjects with COVID-19. Over a 6-month period they evaluated 113 subjects: 65 received HFNC and 48 received combined therapy. The primary outcome was intubation. They found that the ROX index predicted failure of either method, but the intubation rate was only 26%.

Lester and others performed an online survey of subjects with cystic fibrosis (CF), parents of CF subjects, and healthcare personnel at CF programs. The aim of the study was to assess the use, durability, accessibility, and cost burden of compressors/nebulizers. They

describe the source of compressors and nebulizers as well as costs and reported problems. Perceptions of providers and CF subjects were varied. The authors concluded that access to devices and education in use is required.

Verschuur et al performed a cross-sectional analysis from a large database of over 21,000 subjects evaluating individuals with normal pulmonary function but at least one respiratory symptom. They also collected data on smoking history and frailty. Their findings suggest that respiratory symptoms, regardless of smoking history, is a significant correlate of frailty in older adults with normal spirometry.

Subat and others evaluated aerosol generation during methacholine bronchoprovocation testing. Using healthy volunteers they evaluated ultrafine particle generation in a near particle-free laboratory providing nebulization with different devices with and without a filter. They found high particle concentrations during testing which were mitigated by using a breath-actuated nebulizer and a viral filter.

Mustafa et al performed a retrospective study of critically ill pediatric subjects requiring intubation in general hospitals before and after a simulation program which included a critical action checklist. Following the simulation program, the use of a cuffed endotracheal tube nearly doubled and adverse events were reduced. They suggest that a simulation-based intervention program can lead to improvement in pediatric airway management and patient outcomes in non-pediatric hospitals.

Munari and coworkers evaluated the modified medical research council (mMRC) and COPD assessment test (CAT) as instruments to determine physical activity in activities of daily living. The goal of the study was to determine cut points for identification of physical inactivity. They identified an mMRC cut-off point of ≥ 2 discriminated sedentary behavior, while CAT cut-off points of ≥ 16 and ≥ 20 discriminated severe physical inactivity and sedentary behavior.

Bellinghausen and colleagues contribute a special article on the role of respiratory therapists in the ICU recovery clinic. They describe the experiences of 2 centers and review the literature. The paper describes post-intensive care syndrome (PICS) and the current increase in long COVID patients. They note that many PICS symptoms are pulmonary in origin, positioning the respiratory therapist as a critical member of the PICS team. Burnett and Sharpe provide an accompanying editorial describing the growing role of respiratory therapists in disease management and many other post-hospitalization clinics.

Chatburn, Ford, and Kauffman provide an intriguing special article regarding the value-efficiency of respiratory care. They argue for a system to determine and document the value of respiratory therapists. The system moves away from simply documenting time of therapy to a model of value efficiency. Value efficiency includes a measure of value provided to the health system, value provided to the patient, and the value of the therapist in that role. Hess provides accompanying commentary, tracing the origins of the profession and healthcare reimbursement as well as the necessity for the profession to evolve. The future of respiratory therapy is in patient-focused respiratory care protocols that allocate respiratory care towards activities supported by high levels of evidence.

González-Seguel et al provide a narrative review of the adverse events associated with prone positioning. They found that the highest occurrence rates were severe desaturation, barotrauma, pressure sores, ventilator-associated pneumonia, facial edema, arrhythmias, hypotension, and peripheral nerve injuries. Aggarwal and others provide a systematic review of the impact of asthma severity in outcomes in subjects with COVID-19. They found that comorbid asthma increased risk of COVID-19-related hospitalization, but not severe COVID-19 disease.