One of the biggest clinical and technologic advances in respiratory care in recent years is the high-flow nasal cannula (HFNC). We publish 5 papers and an editorial on HFNC in this month's issue.

The aim of the Editor's Choice study, by Vargas and colleagues, was to assess the short-term physiologic effects of HFNC. They compared HFNC, 5 cm H_2O CPAP, and oxygen therapy by facemask. Compared to conventional oxygen therapy, HFNC reduced inspiratory effort and improved oxygenation.

Rittayamai et al compared the physiological effects of HFNC to conventional oxygen therapy in subjects with acute dyspnea and hypoxemia in the emergency department. Underlying pathophysiology included congestive heart failure, acute asthma, COPD exacerbation, and pneumonia. They found that HFNC improved dyspnea and comfort in subjects presenting with acute dyspnea and hypoxemia.

In a retrospective analysis of a heterogeneous population of medical and trauma ICU subjects who received HFNC therapy, Gaunt et al evaluated the effect of HFNC on patient outcomes. Of the 145 subjects who received HFNC, 24% received invasive mechanical ventilation prior to HFNC, 15% received invasive mechanical ventilation after HFNC, and 61% never received invasive mechanical ventilation. HFNC was associated with decreased ICU and post-ICU lengths of stay, and reduced incidence of adverse events.

In a single center before and after study design, Nagata et al evaluated the effect of HFNC for hypoxemic respiratory failure on the use of mechanical ventilation. In the post-HFNC period, there were significantly fewer subjects requiring invasive or noninvasive mechanical ventilation.

In the study by Parke et al, airway pressure measurements and electrical impedance tomography were employed to assess the relationship between flows of up to 100 L/min with HFNC and changes in lung physiology. Airway pressure and lung impedance increased linearly with increased gas flow. Airway pressures observed were in the range used clinically with NIV.

We publish a thoughtful editorial by Roberts and Oeckler, in which they present a perspective on HFNC in the treatment of acute hypoxemic respiratory failure. Although the studies in this issue of RESPIRATORY CARE add to the growing literature suggesting HFNC as a potential alternative to conventional oxygen therapy and NIV, further large randomized clinical trials of diverse, acutely ill populations remain warranted.

The aim of the study by Vaudan et al was to determine whether a dedicated team of respiratory therapists (RTs) applying NIV reduces the risk of intubation or death for subjects with COPD admitted for respiratory failure. Hospital mortality, median length of stay, and intubation risk were lower after implementing the RT team. The authors concluded that delivery of NIV by a dedicated team of RTs was associated with a lower risk of death or intubation in subjects with respiratory failure secondary to COPD exacerbation.

Tsai and colleagues conducted a web-based survey among members of healthcare professional practice organizations representing RTs, nurses, and others. A module on aerosolized medications included sub-modules for antibiotics, pentamidine, and ribavirin. Implementations of safe handling guidelines for pentamidine were not universal, placing workers and others at risk of exposure. Although the antibiotics included in this study lack authoritative safe handling guidelines, prudence dictates appropriate exposure controls.

Olsén and colleagues compared pressures generated from the resistor components of commercial flow dependent positive expiratory pressure (PEP) valves. Pressures generated from the different proprietary resistor components of the 4 commercial PEP devices were not comparable, even though the diameter of the resistance is reported to be the same. Because the pressures generated are significantly different, the resistors may not be interchangeable.

Berlinski and Willis evaluated the effect of tidal volume, nebulizer type, and position in a pediatric model of albuterol delivery during mechanical ventilation. No differences in lung dose or delivery efficiency were found among different tidal volumes for the jet nebulizer at both positions evaluated and for the vibrating mesh nebulizer placed at the ventilator. Moving the nebulizers from before the Y-piece to the ventilator increased lung dose and delivery efficiency for most conditions.

The study by Vianello and colleagues was designed to identify the clinical and pulmonary function variables signaling risk of exacerbation in subjects with quadriplegic cerebral palsy. They found that diagnosis of gastro-esophageal reflux and increased P_{aCO_2} may be simple and clinically useful markers of increased exacerbation risk in young subjects with quadriplegic cerebral palsy.

Sehgal et al describe their experience with flexible bronchoscopy for the removal of tracheobronchial foreign body. A systematic review of the literature was also conducted. Foreign body aspiration is a rare indication for flexible bronchoscopy in adults. Flexible bronchoscopy has a high success rate for removal of inhaled foreign bodies and can be considered the preferred initial procedure for diagnosis and removal of airway foreign bodies in adults.

It is unclear whether the inspiratory times used during manual hyperinflation generate effective expiratory flow-bias. In a bench study by Bennett et al, inspiratory times of at least 3 s with normal compliance and at least 2 s with lower compliance appear necessary to achieve expiratory flow-bias. Questions remain regarding the safety and effectiveness of manual hyperinflation, a technique not commonly used in the United States.

Forte et al evaluated the association between clinical, lung function, sleep quality, and polysomnographic variables with 2 health-related quality of life questionnaires in young adults with cystic fibrosis (CF). Sleep quality index score, 6-min walk distance, sleepiness scale score, and FEV_1 were predictors of the World Health Organization Quality of Life shorter version scores domains. Age at diagnosis, clinical score, sleep quality score, 6-min walk distance, sex, apnea-hypopnea index, body mass index, age, arousal index, FEV_1, and pulmonary arterial systolic pressure were predictors of the Specific CF Questionnaire scores domains.

The aim of the study by Lu and Qian was to identify the biomarkers for predicting refractory *Mycoplasma pneumoniae* pneumonia on time for initiating steroid therapy in children. They found that serum lactate dehydrogenase might be used as a biomarker to predict refractory *M. pneumoniae* pneumonia at the early stage of hospitalization.

Skinner et al investigated physiotherapy in ICU subjects during acute hospitalization. The frequency and type of physiotherapist assessment and treatment were extracted from medical records. Positioning, lung hyperinflation, and suctioning were the most frequently performed respiratory care activities in the ICU.

Sehlin and colleagues evaluated different PEP and CPAP devices on inspiratory capacity (IC) as a measure of induced changes in functional residual capacity (FRC). Provided that total lung capacity was constant, they found that changes in IC could be used as a measure of changes in FRC in healthy volunteers. All investigated devices except the PEP-bottle decreased IC.