Our Editor's Choice paper, by Bach and colleagues, addressed the efficacy of mechanical insufflation-exsufflation and noninvasive ventilation (NIV) in extubating subjects with restrictive pulmonary disorders. A retrospective review was performed for intubated subjects with single organ respiratory muscle failure. It was found that 97 of 98 subjects were successfully extubated. One subject underwent tracheotomy. Despite impressive results in terms of successful extubation in a relatively short time frame, McKim and Rose point out that, for several reasons, the results of this study may not be easily generalizable to the average ICU.

van Oppen and colleagues evaluated the role of transcutaneous CO_2 to guide NIV application. They found that transcutaneous CO_2 monitoring provided a continuous and reliable trend, and also allowed pH prediction. They suggest that this approach is a potential alternative to arterial blood gases in patients requiring NIV for acute hypercapnic respiratory failure. Nuccio suggests that, perhaps if and when the use of this technology is further investigated, and the cost of the equipment is reduced, more centers will see the utility of transcutaneous CO_2 monitoring to manage patients who require NIV.

Predictors of need for NIV during respiratory tract infections in medically stable non-ventilated subjects with ALS was assessed by Sancho et al. Logistic regression analysis showed that the only predictors of need for NIV were FVC% predicted (OR 1.06) and peak cough flow (OR 2.57). Perhaps, as commented on by Braga, many of the subjects in this study should already have been receiving NIV because they presented with an FVC < 75% predicted and P_{Imax} > -60 cm H_2O.

Using a bench study, Conti and colleagues studied the influence of different interfaces on synchrony during pressure support ventilation in a pediatric setting. The interfaces tested were an endotracheal tube, facemask, and helmet. They found that the choice of interface could influence patient-ventilator synchrony, particularly during NIV. The helmet demonstrated the worst synchrony, suggesting that the facemask should be considered as the first choice for delivering NIV in a pediatric model.

Using an ex-vivo experimental design with a lung simulator, Iyer and Chatburn evaluated a new type of nasal cannula, the Neotech RAM cannula, to provide NIV in newborns. They found that the RAM cannula interface, when used with ≤ 30% leak, resulted in clinically acceptable transmission of pressures. With leak > 50%, clinically negligible amount of pressure was transmitted to the simulated lungs.

McMillen et al compared filling times of 4 arterial samplers with plungers at a pressure of 93 mm Hg. They also measured the filling time of one arterial sampler without a plunger at 93 mm Hg and at a simulated venous pressure of 9 mm Hg. They found that, regardless of the sampler brand being used, sampler-filling time could be used to identify a successful arterial puncture.

Tonelli and colleagues hypothesized that $\dot{V}_{O_2}$ estimation in patients with respiratory symptoms is inaccurate and can be improved by considering arterial blood gases or spirometric variables. They developed more accurate formulae to predict resting $\dot{V}_{O_2}$ in patients with respiratory symptoms. The formulae, however, had wide limits of agreement, particularly in certain groups of patients. Thus, arterial blood gas and spirometric variables did not significantly improve the predictive equations.

The objective of the study by Pradella et al was to develop an efficient, low-cost, home-based pulmonary rehabilitation program and evaluate the impact of the program on exercise as measured by the 6-min walk test and treadmill endurance test. They found that their simple and low-cost home-based pulmonary rehabilitation program adapted to real-life and led to improvement in exercise capacity and quality of life.

The aim of the study by Fregonezi and colleagues was to assess expiratory/inspiratory muscle strength in subjects with neuromuscular disease (NMD) and healthy subjects and calculate P_{Emax}/P_{Imax} ratio for these groups. They found that healthy individuals and subjects with NMD showed higher P_{Emax} in comparison to P_{Imax} regarding the P_{Emax}/P_{Imax} ratio. Based on this ratio, NMD showed different patterns of respiratory muscles strength loss. P_{Emax}/P_{Imax} ratio may be a useful parameter to assess the impairment of respiratory muscles in a patient and to customize rehabilitation and treatment.

Spielmanns et al hypothesized that oxygen administration during training sessions enables higher training intensity and thus optimizes training results in COPD patients. They found that endurance training 3 times per week showed significant improvements in quality of life and exercise capacity in subjects with moderate to severe COPD within the initial 12 weeks and remained stable over the following 12 weeks with no further benefits of supplemental oxygen.

Chlif and Ahmaidi investigated the role of mechanical ventilatory constraints in obese class III subjects during incremental exercise. They found that mechanical ventilatory constraints increased progressively with degrees of obesity, contributing to exercise limitation in obese subjects.

The aim of the study by Zanella and colleagues was to precisely determine spatial orientation and better characterize the physical properties of human trachea. They found that the trachea is oriented downward toward the back at a 20.6 ± 6.9° angle and slightly toward the right at 4.2 ± 5.3° angle. Understanding tracheal orientation may enhance airway clearance, and knowing the physical trachea properties may be of interest for endotracheal tube cuff design.

Sazak et al performed a retrospective assessment of the perianesthesic data in 571 subjects undergoing endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) under deep sedation. They found that, independent from the sedative agent, deep sedation can be safe and provide high patient satisfaction during EBUS-TBNA. Combination of ketamine with propofol or midazolam led to decreased doses of these anesthetics. However, incidence of increased blood pressure was higher in groups administered ketamine. There was no relation between recovery time and total dose of anesthetics or presence of chronic disease.

Nasiłowski and colleagues described the evolution of home mechanical ventilation in Poland from 2000 to 2010. The prescription pattern of home mechanical ventilation has evolved and there is a clear shift from neuromuscular to respiratory diseases. The prevalence of ventilation via tracheostomy still remains very high in comparison to other European countries.

Cabrini et al conducted a worldwide survey of NIV use for acute respiratory failure in non-monitored wards. The results of their survey suggest that NIV use in such hospital wards was effective, common and gradually increasing. Improvement in staff training and introduction of protocols could help make this technique safer and even more common when applied in ordinary wards setting.

The purpose of the study by Zhu et al was to assess insulin-like growth factor-1 (IGF-1) and insulin-like growth factor binding protein-3 (IGFBP-3) concentrations in children with obstructive sleep apnea-hypopnea syndrome (OSAHS), and compare the results according to disease severity and duration. They found that that disease duration, but not severity, affects the concentrations of two important mediators of growth and development, IGF-1 and IGFBP-3, in children with OSAHS before and after adenoidectomy or tonsillectomy/adenoidectomy.