This month's Editor's Choice by DiBlasi and colleagues evaluates the impact of a leak on the function of volume-targeted modes in a neonatal animal model. They recorded blood gases, work of breathing indices, and volume delivery with 3 different ventilators. Ventilators differed in the site of volume measurement and algorithm for leak compensation. The interaction of volume monitoring site, leak compensation, and volume targeting scheme is complex and resulted in measurable differences. In the face of a moderate leak, proximal tidal volume monitoring and leak compensation preserved minute ventilation and resulted in lower P_{aCO_2}. In the accompanying editorial, Rimensberger discusses the relative merits of the site of volume monitoring, the accuracy of neonatal volume measures, and whether any of these variables are what's really important (and to whom). He also provides cogent advice on the relative merits of bench and animal studies in evaluating ventilator performance.

Zanella and co-workers describe a technique for secretion removal in intubated subjects without the use of airway suctioning. Using a method meant for removal of secretions above the endotracheal tube cuff, they describe a lung model study combining deflation of the cuff and an artificial cough maneuver. They conducted evaluations in a tracheal model comparing cough peak flow, removal of fluid below the cuff, and prevention of aspiration of fluid from above the cuff. The cough peak flow averaged 1.8 L/s (108 L/min) and tracheal pressure remained at the PEEP level, avoiding aspiration. They suggest this maneuver could eliminate the need for airway suctioning and its attendant consequences. However, no human trials have been conducted. Li et al have described a similar maneuver for removal of secretions above the cuff. They review the importance of coordination of the maneuver and potential advantages and disadvantages.

Ribas et al describe the use of hammock positioning in neonates as a method of reducing pain and improving comfort. In a small group of near-term infants they demonstrated that the hammock position resulted in a lower heart rate, higher S_{pO_2}, improved sleep, and a fall in breathing frequency compared to traditional positioning. Rastogi provides an accompanying editorial discussing these results in light of the American Academy of Pediatrics' recommendations regarding supine sleeping position on a firm surface to reduce sudden infant death syndrome. Both the authors and the editorialist agree that further prospective trials with long-term outcomes are required.

Crisafulli and colleagues evaluated dyspnea perception during exercise in a group of stable COPD subjects. They found that for a similar degree of airflow obstruction, higher dyspnea scores were related to poor exercise capacity. The authors conclude that the severity of airflow obstruction alone is less informative than assessments that include exercise limitation.

The use of oscillating PEP devices to improve secretion clearance in patients with cystic fibrosis (CF) is common. O'Sullivan et al evaluated oscillating PEP use by 21 pediatric subjects with CF following standardized instructions. Despite training, subjects demonstrated poor mastery of technique. The authors conclude that the utility of oscillating PEP for airway clearance may be limited by poor user technique.

Cronly and others evaluated health-related quality of life (HRQOL) in a large number of CF subjects. Each subject completed a background questionnaire, HRQOL questionnaire, and had pulmonary function recorded. They report that mental health variables, including depression and anxiety, were strongly associated with HRQOL and had a greater impact than FEV_1%. These findings mirror those in other chronic diseases and highlight the importance of a holistic approach that treats the individual not just the disease symptoms.

Rapid response teams and systems for alerting patients' decline in condition have become commonplace. The modified early warning score (MEWS) is a score for detecting deterioration and the need for escalation in care. Al-Raimi and others used a validated survey to evaluate respiratory therapist acceptance of the MEWS. They found that respiratory therapists were more inclined to use the MEWS if they were educated about its clinical relevance and had a favorable attitude towards its use.

The 6-min walk test (6MWT) is often used to determine the functional capacity of COPD subjects. A number of methods are utilized to perform the test to accommodate limitations in physical condition or environmental constraints. Frade et al evaluated stationary virtual reality 6MWT compared to a traditional test. They found that there was a learning effect in the virtual reality method, requiring at least 2 tests to achieve the optimum result.

Franks et al compared the performance of 6 different PEP devices in a bench study. They used flows from 5–30 L/min and recorded the airway pressures and oscillation frequency at varying resistance. They report that PEP devices produced small variations in performance characteristics across a range of flows and resistance settings. Devices could be classified as flow-dependent or non-flow-dependent based on the response to flow.

Selman and others compared incremental stepping, a 6-min constant stepping, and treadmill running test to evaluate exercise-induced bronchospasm (EIB) in pediatric subjects. They found that the lower prevalence of EIB in stepping compared to treadmill running was not due to a lower minute ventilation during the stepping method. They conclude that stepping might be useful as a screening test for EIB due to the easy method and low cost, but that a negative test should be confirmed in a running-based test in symptomatic patients.

High-flow nasal cannula therapy has become a popular method of noninvasive respiratory support in recent years. Madney et al evaluated salbutamol delivery through a large bore nasal cannula via 2 nebulizers in a group of COPD subjects and in a bench study. They used urinary salbutamol levels to evaluate delivery in 12 subjects. They report that salbutamol delivery was greater with a mesh nebulizer compared to a jet nebulizer via a large bore nasal cannula in both the clinical and bench study. Importantly, these studies did not evaluate subject response, simply drug delivery.

Guan et al used semi-directive interviews to evaluate the health behaviors and perceptions of well-being in a group of adults with bronchiectasis. They report that there were wide disparities in symptom perception and that medication adherence was poor. Subjects expressed concerns related to fertility and infection risks to others. The diverse perceptions in this trial provide a road map for interventions in patients with bronchiectasis.

Santa Cruz and others provide a systematic review of the impact of age on the mortality of mechanically ventilated subjects. Using the GRADE score to evaluate evidence quality, they found that while the evidence was of low quality, advanced age appears to be associated with a greater mortality in mechanically ventilated subjects.