In our Editor's Choice paper, Dubosky and colleagues evaluated whether there was a difference in the ventilator-associated pneumonia (VAP) rate and patient outcomes between the vibrating mesh nebulizer (VMN) and the metered-dose inhaler (MDI). They found no association between use of an MDI or VMN and VAP, days on the ventilator, or in-hospital mortality. As Gilmore points out, although the MDI has a long-standing application for patients receiving mechanical ventilation, the VMN may offer a viable, safe alternative without the disadvantages of conventional jet nebulizers.

Krakow et al evaluated a re-titration protocol in subjects failing CPAP. Technology-related problems and residual breathing events were associated with CPAP failure. Technological solutions (changes in masks, modes, and pressures) were addressed during re-titration, after which 72% of subjects re-initiated positive airway pressure use. These technological interventions were associated with improved objective and subjective sleep variables and reversal of CPAP failure. Testelmans and Buyse suggest that, in the future, more tools are needed to select those patients who need to be switched to another PAP mode and to better guide the initial PAP mode, in order to minimalize the number of re-titrations necessary.

Melani and colleagues evaluated the time required to rectify inhaler errors in experienced users with a baseline faulty technique, and to determine whether this time of re-education to restore inhaler mastery differs between devices. They found that, in experienced subjects with baseline faulty inhaler use, the mean time of education required to achieve and demonstrate mastery with dry powder inhalers was lower than with MDIs. Variables associated with increasing time for correcting inhaler errors were an older age, a lower level of education, and no reported previous instruction of inhaler use.

Bose et al describe the admission characteristics, drivers, and time to onset of initial cardiorespiratory instability events in subjects in a monitored step-down unit. Time to onset of first cardiorespiratory instability event most commonly occurred due to pulse oximetry and was associated with prolonged step-down unit and hospital length of stay. The findings of this study suggest the need for clinicians to more closely monitor patients transferred from an intensive care unit and the parameters (S_{pO_2}, breathing frequency) that more commonly precede cardiorespiratory instability events.

The Respiratory Movement Evaluation Tool (RMET) is a method of quantifying respiratory movement using fiber-grating sensors. Liu and colleagues evaluated the clinical feasibility, reliability, and validity of this method. Significant correlations were observed between the respiratory amplitudes measured with RMET and the amount of air during ventilation measured with a spirometer. The authors concluded that RMET was feasible for use in clinical practice.

The physiologic acute effects on cough peak flow and chest wall volumes of healthy subjects was evaluated by Sarmento et al. Significant increases in cough peak flow and inspiratory capacity were found immediately after air stacking. The authors concluded that, in healthy subjects, cough peak flow and chest wall volumes can be increased immediately after the application of air stacking maneuver.

The aim of the study by Santos and colleagues was to determine the end-expiratory pressures and oscillation frequencies generated when a range of flows were applied to therapist-made bubble-PEP devices (Bubble-PEP-3cm and Bubble-PEP-0cm) and the commercial bubble-PEP devices AguaPEP, Hydrapep and Therabubble. All devices investigated produced similar oscillation frequencies. Bubble-PEP-3cm maintained the most stable pressure throughout the range of flows tested.

Using 4 oscillatory positive pressure devices, Van Fleet and colleagues hypothesized that peak pressure, positive expiratory pressure, oscillatory frequency, and pressure amplitude differ depending upon the device used, device resistance setting, and time. They found clinically relevant variations in peak pressure, positive expiratory pressure, and pressure amplitude between devices and within a device as the resistance setting changed. The combination of device, time and resistance settings affect device output for pressure, amplitude and oscillatory frequency.

Kogo et al evaluated whether enteral nutrition was a risk factor for airway complications in subjects undergoing non-invasive ventilation (NIV) for acute respiratory failure. The rate of airway complications was significantly higher and the NIV duration significantly longer in subjects who received enteral nutrition than those that did not. However, multivariate analysis showed that enteral nutrition was unrelated to in-hospital mortality.

Bourgoin and colleagues described the relationship between the Bohr and Enghoff measurements of dead space in mechanically ventilated children with ARDS. The dead space measurements using the Bohr and Enghoff approaches were not different when P_{aO_2}/F_{IO_2} was greater than 300, except in the case of status asthmaticus. In patients with lower P_{aO_2}/F_{IO_2}, the method to measure dead space should be reported, as the results cannot be easily compared if the measurement methods are not the same.

Smallwood et al assessed the accuracy and agreement of 2 devices currently on the market using a pediatric in vitro model of gas exchange. One of the devices demonstrated bias and limits of agreement that were not clinically acceptable. Another device demonstrated acceptable bias and limits of agreement for $\dot{V}_{O_2}$ and $\dot{V}_{CO_2}$ in the range 40–100 mL/min.

The feasibility of mid-frequency ventilation among infants with respiratory distress syndrome was evalutated by Bhat et al. Based on this small pilot study, mid-frequency ventilation among preterm infants with respiratory distress syndrome appears feasible. Further larger and longer duration trials are necessary to validate these findings.

Han et al evaluated the treatment of pulmonary arterial hypertension (PAH) using initial combination therapy of bosentan and iloprost. Initial combination therapy in treatment-naïve PAH subjects with WHO functional class III or IV significantly improved 6-min walk distance, hemodynamics, and quality of life compared with monotherapy.