The Editor's Choice is a comparison of vibrating mesh (VM), jet, and breath-enhanced nebulizers (BEN) during mechanical ventilation. Ashraf and colleagues used radiolabeled saline to evaluate inhaled mass and aerosol particle size with each device. Two nebulizers were placed on the dry side of the humidifier while the BEN was placed after the humidifier; the BEN was less sensitive to effects of humidification. VM nebulizer delivery was unpredictable due to failure to completely nebulize the solution in half the studies. They conclude that BEN technology ensured better control of drug delivery. In an accompanying editorial, Berlinski compares advantages and disadvantages of different nebulizers, arguing for improvements in technology and tailoring of devices for specific needs.

Kuch and others describe the impact of intravenous pulmonary vasodilators on human bronchial epithelial cells in culture. They used a glycine or arginine diluent, both of which are alkaline, compared to a control. They found a reduction in ciliary beat frequency and increased cell death in treatment groups. Ciliary beat frequency ceased immediately after exposure to the drug preparation. The authors conclude that in ventilated patients these findings may result in important alterations in lung function. Rubin's accompanying editorial highlights the role of basic science in describing mechanistic effects, but tempers the import, pending in vivo studies.

Bourassa et al describe the automated titration of low-flow oxygen to subjects with COPD wearing a gas mask. They compared the oxygen flow requirement to maintain a set oxygen saturation (S_{pO_2}) in subjects exposed to hypoxic gas mixtures. Both healthy and COPD subjects required a range of oxygen flow between 0 and 2.9 L/min to maintain S_{pO_2}. They found important reductions in the amount of oxygen delivered were obtained by use of automated oxygen delivery and targeted S_{pO_2}. Kaczka and others provide comment on the features and potential advantages of closed loop oxygen systems.

Moore and others describe the impact of nebulizer cleaning and drying on the potential for bacterial colonization in patients with cystic fibrosis. They compared several variables related to assembly/disassembly, different cleaning solutions, and drying methods on the survival of *P. aeruginosa*. Complete nebulizer drying was essential for elimination of bacterial contamination of devices.

Moody et al evaluated jet and vibrating mesh nebulizers to deliver bronchodilators to pediatric asthma subjects in the emergency department. Subjects were treated according to a protocol, and the time to reach a mild asthma score, number of treatments, and hospital admission were recorded. Subjects treated with a mesh nebulizer required fewer treatments and achieved the desired reduction in asthma score more quickly.

Al-Subu et al performed a retrospective chart review of bronchodilator delivery via high-flow nasal cannula (HFNC) in pediatric subjects. They found heart rate increased during HFNC aerosol delivery versus traditional delivery methods, with no difference in other measures. Bronchodilator delivery using HFNC was feasible at low gas flows (2–4 L/min), but HFNC did not improve subjects' comfort, and it increased respiratory therapists' bedside time.

In a cross-sectional observational trial, Ocakli et al evaluated the impact of gender on inhaler technique. Subject sociodemographic characteristics, inhaler therapy, subject-reported difficulties, and clinician-reported errors in inhaler technique were recorded. Errors were common. Subject-reported difficulties were more prevalent among women. A lack of training regarding inhaler technique predicted a higher likelihood of errors.

Herrero-Cortina and others evaluated the importance of sputum weight as a method for comparing airway clearance therapy in subjects with bronchiectasis. They collected sputum expectorated over 24 h on 2 separate days, with and without airway clearance therapy. They also determined the minimal important difference in sputum production. They concluded that when sputum weight is used as an outcome, multiple measurements should be included.

Holley and others evaluated post-deployment service members for isolated small airway dysfunction (SAD) during exercise testing. SAD was analyzed for association to ventilation parameters at exercise. They found poor agreement across tests use to detect SAD. The addition of SAD to lung function testing did not predict changes in response to exercise.

Ramirez and others performed a retrospective chart review in 30 mechanically ventilated subjects to determine adherence to an oxygen therapy protocol. Subjects in the medical ICU placed on the oxygen therapy protocol experienced a significant delay in oxygen weaning. They suggest closer monitoring and adherence to the oxygen weaning protocol to reduce the potential risk for hyperoxia.

Grim et al evaluated the changes in attitudes and practice of oxygen therapy following implementation of a conservative oxygen guideline. The authors surveyed physicians before and after guideline initiation. After implementation, 5,840 subjects were admitted to 3 ICUs, and 101,869 ABGs were retrieved. Actual practice changed, with overall lower oxygenation levels (median PaO_2 77 mm Hg, versus 86 mm Hg before implementation), and a decrease of PEEP and FIO_2.

Nair and Smith evaluated a phased quality improvement (QI), intervention aimed at reducing unplanned extubation in the ICU. In a retrospective review they report 7.2 unplanned extubations/100 ventilator days. The QI process included standardizing endotracheal tube fixation, monitoring of fixation through checks, 2-person technique for care, and adverse event reporting. Following QI initiation, the rate of unplanned extubation fell to 1.4/100 ventilator days.

Kalra and coworkers performed a retrospective study of tidal volume (V_T) setting in subjects with ARDS, stratifying groups based on body mass index. Over half the subjects were classified as obese, with a fifth meeting criteria for morbid obesity. Subjects in the morbid obesity group were 3 times as likely to receive a V_T of > 8 mL/kg on day 1 and required rescue therapies more frequently.

Metkus et al used the National Inpatient Sample to evaluate noninvasive ventilation (NIV) failure in subjects with acute heart failure. In nearly 280,000 subjects, NIV failure occurred in 1.5% of cases. Failure was associated with cardiogenic shock and cardiac arrest resulting in a morality rate of 26% in the NIV failure group versus 6% in those successfully treated.

Miller and others utilized a national database to evaluate pediatric intubations by respiratory therapists (RTs). The authors collected data regarding the reason for intubation, drugs used, number of attempts, and adverse events. Only 1% of first intubation attempts were made by RTs. They also found that RTs had success rates similar to other providers, but higher adverse event rates. RTs were more likely to use videolaryngoscopy.

Adherence to CPAP therapy at home remains a major impediment to its use. Avellan-Hietanen and colleagues evaluated subjects who had CPAP re-initiated following a failed CPAP trial. They found that subjects selected for a second trial had more severe sleep apnea compared to a control group of naïve users. After 1 year, 67% of the naïve subjects continued to use CPAP versus only 52% of subjects on their second trial. CPAP acceptance was higher among men than women.

Silva et al evaluated the impact of early passive exercise with a cycle ergometer on patient-ventilator interaction. In a small group of heavily sedated subjects, 20 min of passive leg exercises were followed by 10 min of rest. Despite sedation, the asynchrony index increased significantly compared to at rest. The two most frequent asynchronies were missed triggers and flow asynchrony.

Granchi and others evaluated the relationship of inhalation injury and deadspace in predicting injury severity and outcome. In this retrospective review of 51 subjects, a modified deadspace calculation found that deadspace was significantly higher in non-survivors, but the presence of pneumonia did not result in deadspace differences. They conclude that deadspace measures can be used to assess severity of injury and prognosis.

Shi et al provide a systematic review of radiographic bronchiectasis in COPD. They conclude that COPD-bronchiectasis phenotype had adverse effects on subjects' prognosis. Shan et al provide a systematic review on the use of NIV as a weaning strategy for hypoxemic respiratory failure. Using data from 6 trials, they note that NIV as a weaning strategy did not decrease hospital mortality, but did reduce ICU length of stay and adverse events.

D'Urzo and others provide a narrative review of the variation in spirometry interpretation algorithms. Lellouche and L'Her pen a fascinating review on monitoring oxygen therapy, with an eye toward early warning scores.

From the New Horizons Symposium, Newth et al describe ventilator weaning in pediatrics, and Walsh reviews the use of inhaled pulmonary vasodilators in the PICU.