

Although diagnosis of ventilator-associated pneumonia (VAP) is controversial, current strategies for diagnosing VAP favor the use of quantitative methods. However, semi-quantitative cultures of endotracheal aspirates are still commonly used. It is against this background that the paper by Fujitani et al is of interest. They report perfect agreement between endotracheal aspirates and non-bronchoscopic bronchoalveolar lavage (BAL) in 58% of samples, and results were completely discordant in 24% of samples. The authors conclude that semi-quantitative cultures of endotracheal aspirates are poorly concordant with quantitative cultures obtained via non-bronchoscopic BAL. As Marik reminds us in his editorial, the clinical criteria for diagnosis of VAP lack specificity, which makes the case for analysis of BAL fluid for the diagnosis of VAP. There is a high concordance between the results of quantitative culture of BAL fluid performed via bronchoscopy with that performed blindly by mini-BAL. Performing mini-BAL should be part of the armamentarium of skills of the respiratory therapist.

Originally described more than 15 years ago, the rapid-shallow-breathing index (RSBI) has been widely used to evaluate mechanically ventilated patients for weaning and extubation. It is determined in a variety of ways. Patel et al report no significant differences in the RSBI obtained using ventilator-derived versus off-ventilator manual measures. However, the RSBI was significantly less when measured on 5 cm H₂O CPAP, compared to T-piece. In his editorial, Siegel asks the important question, "How should the RSBI be used then, if at all?" Whether the RSBI contributes any important information beyond the results of a spontaneous breathing trial remains to be determined.

Adaptive pressure control (APC) is a mode of mechanical ventilation in which the ventilator adjusts inflation pressure to achieve a target tidal volume. This means that inflation pressure is reduced if patient effort increases, which may or may not be clinically appropriate. Mireles-Cabodevila and Chatburn used a lung simulator to evaluate the relationship between ventilator work output and patient effort in APC in 5 different ventilators. They found that the ventilators showed 3 patterns of behavior in response to an increase in simulated muscle pressure. In the one pattern, ventilator work gradually decreased to zero as muscle pressure increased. In a second pattern, ventilator work decreased at the same rate as muscle pressure increased, but reached a plateau by delivering a minimum inspiratory pressure. The third pattern appeared to be a combination of patterns 1 and 2. Although some ventilators provide a minimum level of support during APC, regardless of patient effort, of concern is that others allow the patient to assume all of the work of breathing. In other words, they will take away all support during APC if patient effort results in a tidal volume that exceeds the target. As Jaber points out in his editorial, to date there have been no randomized controlled trials with large numbers of patients to evaluate the use of APC in the intensive care unit. Jaber is correct in his call for clinical studies to define the appropriate role of new ventilator

modes. We look forward to publishing the results of such studies in *RESPIRATORY CARE*.

Mechanical insufflation/exsufflation (MIE), also called cough assist, increases peak cough flow and may improve sputum clearance. Despite a lack of high-level studies, MIE is well accepted in the care of patients with neuromuscular disease. Chatwin and Simonds evaluated the short-term use of MIE as a supplement to standard NIV plus physiotherapy in 8 patients with neuromuscular disease. They report that the addition of MIE shortened airway-clearance sessions. They speculate that MIE may provide additional benefit for patients with neuromuscular disease and respiratory-tract infection. They also correctly recommend that further studies are indicated to evaluate the role of MIE in the care of this patient population.

The Acapella is another device designed to aid sputum clearance. When the patient exhales through this device, oscillatory pressure levels with a mean pressure greater than 10 cm H₂O occur. Silva et al evaluated software to help the user to achieve optimal conditions for use of this device. They found that the Acapella may produce clinically adequate values of mean pressure and oscillation frequency, but it depends on its use at optimal conditions. As this was a bench study, clinical studies are needed to evaluate the utility of this software tool to optimize the practical use of the Acapella.

Patients with obstructive lung diseases such as chronic obstructive pulmonary disease (COPD) commonly use nebulizers for inhaled drug delivery. There is no doubt that breathing patterns by patients during aerosol drug delivery may vary, but it is unclear whether this affects the emitted quantity of nebulized drug. Bauer et al used a breath simulator set to mimic 4 breathing patterns that represent a range of tidal volumes, inspiratory times, and expiratory times observed in patients with COPD. The results of these breath-simulation experiments suggest that only about 20% of the nominal dose was emitted from the nebulizer with each of the 4 breathing patterns studied. Similar to previous studies, a longer inspiratory phase was associated with a greater inhaled dose. Studies such as this are important to characterize drug delivery under standardized conditions. But, as with any in vitro study, the results require clinical validation.

This month's case report is by Hayes et al and describes a case of varicose bronchiectasis with a bulbous appearance in a 6-year-old child with a complicated course including bronchopulmonary dysplasia during the neonatal period. The Teaching Case of the Month, by Venkata et al, describes the management of refractory hypoxemic respiratory failure due to adenocarcinoma of the lung with predominant bronchioloalveolar carcinoma component.

The OPEN FORUM at the 55th International Respiratory Congress of the American Association for Respiratory Care is an opportunity for attendees to review the results of scientific studies performed by their colleagues. *RESPIRATORY CARE* is pleased to publish these abstracts in the November issue. We also look forward to publishing papers arising from these abstracts in the future.