# Editor's Commentary

We begin this issue with 2 papers related to the ratio of physiologic dead space to tidal volume ($V_D/V_T$). In 80 intubated patients during the early phase of acute respiratory distress syndrome (ARDS), and in 49 patients during the intermediate phase, Raurich et al evaluated the prognostic value of $V_D/V_T$. They report that increased $V_D/V_T$ in both the early and intermediate phases of ARDS is associated with a greater risk of death. McSwain et al evaluated the effect of $V_D/V_T$ on the relationship between $P_{ET}CO_2$ and $PaCO_2$. They found strong correlations between $P_{ET}CO_2$ and $PaCO_2$ in each of the $V_D/V_T$ ranges evaluated. However, the $PaCO_2$-$P_{ET}CO_2$ difference increased with increasing $V_D/V_T$. In their editorial, Kallet and Siobal suggest that, given the relative ease of determining $PaCO_2$ and $P_{ET}CO_2$, use of this physiologic variable may be useful to evaluate changes in $V_D/V_T$, to assess lung recruitment, and to optimize gas exchange.

Preventing micro-aspiration in mechanically ventilated patients is a key strategy toward reducing ventilator-associated pneumonia (VAP) rate. One intervention involves placing mechanically ventilated patients into the semi-recumbent position rather than the supine position. However, as pointed out in the editorial by Callcut, the data supporting the semi-recumbent position are relatively sparse. Recent experimental evidence suggests that maintaining the endotracheal tube horizontal, with its external end below the level of the trachea, may be more effective than the semi-recumbent position. This position is similar to the recovery position in basic life support. Mauri et al tested the feasibility of the lateral-horizontal patient position in 10 mechanically ventilated patients. They found that implementation of the lateral-horizontal position for 12 to 24 hours in adult intubated patients was feasible, and the incidence of aspiration of gastric contents in the lateral-horizontal position was similar to that in the semi-recumbent position. As Callcut recommends, a larger, prospective, potentially multicenter trial should be undertaken to answer the efficacy questions about this novel technique that appears relatively safe and feasible.

Among the unfortunate effects of the response to the World Trade Center attack are the possible health effects from exposures sustained by first-responders to the disaster. A federally funded program evaluated more than 13,000 of those workers and volunteers. Enright et al evaluated the ability of spirometry technicians in the World Trade Center Worker and Volunteer Medical Screening Program to meet American Thoracic Society spirometry quality goals. They found that overall spirometry quality in this multicenter program was very good. They also suggest that efforts to improve spirometry quality should focus on the performance of individual spirometry technicians. In his editorial, Haynes points out that high-quality spirometry data are essential not only for epidemiologic studies, but also for individual patient diagnostics. Thus, monitoring of spirometry quality, coupled with technician feedback, is necessary to improve spirometry quality.

Diaz-Guzman et al retrospectively reviewed over 43,000 pulmonary function testing sessions, which yielded 130 patients who satisfied the criteria for combined obstruction and restriction. The authors concluded that combined obstruction and restriction occurs infrequently and is more commonly caused by a combination of pulmonary parenchymal and nonpulmonary disorders. Interestingly, they also surveyed pulmonologists regarding the frequency of combined obstruction and restriction. These physicians' impressions were that there were much higher frequencies of combined obstruction and restriction than that observed from this retrospective review.

Electrical power failure represents an important challenge in the intensive care unit (ICU). Blakeman et al tested the duration of operation of the internal batteries of 4 ICU ventilators. The battery-duration range of the tested ventilators was 20.5 to 170.5 min. Battery duration was shortened by operation of an internal compressor, but not by PEEP or breath type. Interestingly, there was no correlation between battery duration and battery age. As the authors recommend, clinicians need to be aware of these differences in the event of power failure.

Because alpha-1 antitrypsin deficiency is under-recognized, affected individuals often experience long delays in diagnosis before correct diagnosis. Taliercio et al evaluated internal medicine house officers' and respiratory therapists' (RTs) knowledge of this disorder. They found a low level of knowledge as assessed by a Web-based test of physicians and RTs. The scores did not differ among the physicians when examined by subspecialty or post-graduate education level. However, RTs who had graduated from a 4-year RT program had a higher mean score than those who had graduated from a 2-year program. As the authors suggest, causes of under-recognition of alpha-1 antitrypsin deficiency, including the possibility of poor knowledge, warrant further study.

Johnston et al evaluated the risk factors for extubation failure in infants (ages 1 to 12 months) with severe acute bronchiolitis. They found that lower minute volume and lower peak inspiratory pressure had large areas under the receiver operating characteristic curve for extubation-failure risk. As they correctly point out, in infants with severe acute bronchiolitis the extubation process is complex because of the combined features of this disease. Further work is needed to evaluate the ventilatory predictive indexes of extubation failure risk in infants with severe acute bronchiolitis.

Adaptive support ventilation (ASV) is a new mode of mechanical ventilation based on the minimum work of breathing (WOB) principle. Although the operator manual recommends that the percent minute volume setting be started at 100%, it is unclear whether that setting reduces WOB in patients with respiratory failure. Wu et al evaluated the correlation between the percent minute volume setting and WOB during ASV in 22 patients with respiratory failure. Interestingly, they found that the 100% setting was frequently not associated with lower WOB in patients with respiratory failure. They also found that the percent minute volume setting that significantly reduced WOB could be detected by increasing it until a few mandatory breaths begin to appear, which was on average 165% of the minute volume setting. This was higher (180%) in the non-COPD patients than in the COPD patients (125%). These results indicate that the operator manual's suggested starting percent minute volume of 100% is probably inadequate for reducing WOB in most patients with respiratory failure.

This month's Case Report, by Walsh et al, describes respiratory distress associated with inadequate ventilator flow response in a neonate with congenital diaphragmatic hernia. The Teaching Case of the Month, by Tulczynska and Fleischman, describes a case of abdominal tuberculosis as an unusual cause of abdominal pain.