We begin the November 2010 issue of the Journal with a paper by Raurich et al evaluating hypercapnic respiratory failure in patients with the obesity-hypoventilation syndrome. The authors evaluated the effect of acetazolamide on bicarbonate (HCO₃⁻) concentration and CO₂ response. Not surprisingly, patients with higher HCO₃⁻ had a more blunted CO₂ response. After acetazolamide treatment, HCO₃⁻ decreased and CO₂ response increased. As Powers points out in his editorial, acetazolamide may be helpful in ventilator liberation if HCO₃⁻ is increased in this patient population. However, although the use of acetazolamide might facilitate extubation, it is not likely to affect the need for continuous positive airway pressure or noninvasive ventilation in these patients.

Wang et al report the effects of a flutter mucus-clearance device on pulmonary function test results in healthy people 85 years of age and older in China. The intervention group used the flutter mucus-clearance device during pulmonary exercises, whereas the control group had no interventions other than routine healthcare. The increase in forced vital capacity at day 28 was greater in the group using the flutter device. As Sorenson points out in her editorial, this study is interesting, not only because it suggests a method to preserve pulmonary function in the elderly, but also because persons over 85 years of age are often not included in clinical research.

The conventional approach to acid-base interpretation uses standardized base excess, HCO₃⁻, and the anion gap. The Stewart approach theorizes that plasma pH depends on PaCO₂, the strong ion difference, and the plasma concentration of non-volatile weak acids. In patients with chronic respiratory failure, Guérin et al describe acid-base disorders using the Stewart approach and the conventional approach. They found that, in patients with chronic respiratory failure, the acid-base pattern is complex, metabolic alkalosis is present in some patients with elevated HCO₃⁻ and metabolic acidosis is present in some patients with non-elevated HCO₃⁻. The diagnostic performance of the Stewart approach was better than that of the conventional approach, even when corrected anion gap was taken into account. Clinicians tend not to use the Stewart approach, finding it more complex than the conventional approach. Studies such as this one, however, suggest that the Stewart approach should be used more commonly to assess acid-base disorders in acutely ill patients.

Quantitative analysis of computed tomography (CT) images of the lungs is currently the accepted standard for functional residual capacity (FRC) measurement (FRC-CT), but this is not practical for routine use. Gas dilution and gas tracer technologies, while attractive for research applications, require specialized equipment and skills that preclude their use in the clinical setting. A method incorporating wash-in/wash-out (FRC-WI/WO) has recently been added into a commercially available ventilator. Graf et al evaluated FRC-CT against FRC determined by FRC-WI/WO in an animal model of unilateral pleural effusion. They found excellent agreement between FRC-WI/WO and FRC-CT in this study. The measurement of FRC in mechanically ventilated patients might help track the extent of acute lung disease, monitor recruitment of unstable lung units, or guide the use of positive end-expiratory pressure (PEEP). Because this animal study did not address the use of FRC in subjects with acute lung injury, further study is needed to evaluate the role of FRC measurement in critically ill patients.

Fluoroscopic guidance may be utilized in some bronchoscopic procedures. Because the radiation dose has never been quantified, the risk remains unknown. Steinfort et al evaluated patient and clinician radiation exposure from fluoroscopy during bronchoscopy. They found that patients are exposed to relatively small amounts of radiation from fluoroscopy during bronchoscopy. Adequate shielding of clinicians results in negligible radiation doses during ultrasound bronchoscopy. Thus, clinically indicated fluoroscopic guidance during bronchoscopy should not be precluded on the basis of radiation safety concerns.

Tai chi is a gentle, meditative exercise that employs detailed regimens of flowing circular movements, balance and weight shifting, breathing techniques, and cognitive tools such as visualization and focused internal awareness. It provides mild to moderate aerobic activity, it contains elements of breathing and respiratory muscle training, and it includes stress management. Each of these characteristics is an important aspect of COPD management. Tai chi is safe, accessible, enjoyable, and has a high adherence rate. Yeh et al report the results of a randomized controlled trial on the effect of a tai chi program on quality of life and exercise capacity in patients with COPD. They found that tai chi is feasible in patients with moderate to severe COPD. Tai chi exercise as an adjunct to standard care warrants further investigation.

Permissive hypoxemia is a lung-protective strategy that aims to provide the patient with severe acute respiratory distress syndrome (ARDS) a level of oxygen delivery that is adequate to avoid tissue hypoxia while minimizing the detrimental effects of the often toxic ventilatory support required for normal arterial oxygenation. Abdelsalam and Cheifetz review the use of goal-directed therapy for severely hypoxic patients with ARDS, with an emphasis on the role of permissive hypoxemia. This review should provide a basis for continued thought, discussion, and research on this subject.

Kelly et al report a case of chemotherapy-associated recurrent pneumothoraces in lymphangioleiomyomatosis. Yacovone et al report a case of intercostal artery laceration following thoracentesis. The Teaching Case of the Month, by Goldman et al, is a case of cryptococcosis in an immunocompetent patient.

The OPEN FORUM at the 56th 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.