

The effectiveness of aerosol delivery during mechanical ventilation is influenced by patient, ventilator, and nebulizer variables. The impact of nebulizer type, position in the circuit, and bias flow has not been established for different age populations. It is against this background that we publish 2 papers by Ari et al. In the first study, they evaluated drug delivery by jet nebulizer, vibrating-mesh nebulizer, ultrasonic nebulizer, and metered-dose inhaler with spacer in a model of adult mechanical ventilation. In the second, they found that nebulizer placement between the ventilator and the humidifier increased drug delivery with both a jet nebulizer and a vibrating-mesh nebulizer, compared to the more common position near the ventilator Y-piece. Higher bias flow reduced drug delivery. Drug delivery with the vibrating-mesh nebulizer was 2- to 4-fold greater than with the jet nebulizer. The important finding of both studies was that, during mechanical ventilation, optimal drug delivery efficiency depends on the aerosol generator, the ventilator circuit, and the aerosol generator position. As DiBlasi points out in his editorial, these papers do not address clinical efficacy, but they do provide a foundation upon which clinical trials can be designed to determine the best way to deliver bronchodilators during mechanical ventilation.

The team responsible for performing airway management throughout the hospital must have immediate access to intubation equipment. The bag containing airway equipment must be light enough to be carried easily and include equipment to manage airways in various settings. Transport of the bag throughout the hospital raises concern about transmission of infection. Wilcox et al evaluated the effect of a change from one type of bag to another. They found that replacing a large canvas bag with a smaller nylon bag improved the transport of emergency airway equipment, including ease of locating equipment and reducing the transport of pathogens throughout the hospital. As Howard observes in his editorial, Wilcox et al are to be commended for identifying a problem, taking a multidisciplinary approach to finding a solution, and evaluating the effect of the intervention.

Respiratory therapists (RTs) are often involved in treating dying patients, but receive little instruction in end-of-life care. Brown-Saltzman et al developed an interdisciplinary program to introduce practicing RTs to ethical and end-of-life issues. They found that a one-day interactive educational intervention can improve short-term RT comfort and role perception concerning end-of-life care. As Willms states in his editorial, the RT has not only the technical expertise required for terminal extubations, but also a broader professional role that may enhance the professionalism and prestige of the field, as well as individual job satisfaction.

In the 1970s and 1980s, intermittent positive pressure breathing (IPPB) treatments were commonly administered to many patients with various forms of respiratory failure. Lacking evidence of benefit, IPPB treatments fell out of favor by the late 20th century. Guérin et al conducted a short-term study in stable patients with neuromuscular disease to determine the effects of IPPB with and without an abdominal belt. IPPB was performed as 30 consecutive deep breaths up to 30 cm H₂O in several body positions. Supine IPPB treatments, with or without an abdominal belt, increased ventilation to anterior regions of the lungs. Interestingly, the effects 3 hours after IPPB treatments remained higher than at baseline and were best preserved with the use of an abdominal belt. Further study is needed

to determine whether outcomes might be improved in this patient population with the use of IPPB.

The long-term stability of the accuracy of a specific model of spirometer should be carefully characterized before modification of the frequency of calibration checks is considered. Skloot et al evaluated the EasyOne spirometer calibration stability over a 4-year period in conjunction with the World Trade Center Worker and Volunteer Medical Screening Program. They found that this specific spirometer retained volume accuracy of better than 3% for at least 4 years. However, whether similar results might occur with other spirometers is not known and thus these results should not be generalized to all portable spirometers.

Current generation ventilators allow clinician adjustment of rise time during pressure-targeted ventilation. Murata et al investigated the effect of inspiratory rise time on inspiratory work load during pressure-support ventilation in 6 ICU ventilators. They found that a short inspiratory rise time decreased inspiratory work load, regardless of other settings on the ventilator. As this was a lung model study, additional work is necessary to determine whether these findings translate to the clinical setting.

Positive effects from noninvasive ventilation (NIV) or supplemental oxygen on exercise capacity in patients with COPD are well known. In the study by Borghi-Silva et al, patients with stable COPD undergoing an exercise training program were randomized to either NIV or supplemental oxygen. They found that NIV alone was better than supplemental oxygen alone to promote beneficial physiologic adaptations to physical exercise in patients with severe COPD.

Hashemi et al conducted a case-control study to evaluate occupational exposures and obstructive lung disease. They found that hairdressing work is associated with a high frequency of work-initiated respiratory symptoms and, to a lesser extent, with allergic symptoms, particularly after exposure to bleaching powder and hair spray. Because this study was conducted in Iran, further work is necessary to determine whether similar results occur elsewhere.

Activated protein C reduces 28-day mortality in patients with severe sepsis, but its anticoagulant properties entail a risk of bleeding. Khan et al conducted a systematic review and meta-analysis of the prevalence of serious bleeding events and intracranial hemorrhage in patients receiving activated protein C. The results of the meta-analysis suggest that activated protein C is associated with significant risk of bleeding, so strict inclusion and exclusion criteria should be set prior to administering this drug.

We are pleased to publish the 36th Donald F Egan Scientific Memorial Lecture by Rubin, which reviews the history of aerosol therapy, discusses patient, drug, and device factors that can influence the success of aerosol therapy, and identifies trends that will drive the science of aerosol therapy in the future. We are equally pleased to publish the paper from the 25th Philip Kittredge Memorial Lecture by Needham, which addresses issues related to patient safety, quality of care, and knowledge translation in the ICU.

A case report by Lan et al documents the diagnosis and treatment of a solitary primary tracheal small-cell lung cancer causing acute respiratory failure. Another case report, by Kreuter et al, describes a 65-year-old man with an endobronchial gossypiboma after lobectomy for abscessing pneumonia. The Teaching Case of the Month, by Bavishi, recounts a case of pulmonary cryptococcosis caused by capsule-deficient *Cryptococcus neoformans* in an immunocompetent patient.