

Noninvasive ventilation (NIV) is a standard of care for patients with COPD exacerbations. However, its role in severe acute asthma is not well defined. Gupta et al randomized patients with acute asthma to receive standard medical therapy with or without NIV. They found that the addition of NIV to standard medical therapy accelerated improvement in lung function, decreased the inhaled bronchodilator requirement, and shortened the ICU and hospital stay. However, it did not improve mortality, as there were no deaths in either group. As Scala points out in his editorial, additional studies are needed to determine when, where, and why a trial of NIV might be justified in severe acute asthma.

Nasal CPAP can be administered to neonates using electronic feedback control, underwater seal, flow opposition, and flow opposition with fluidic flow reversal on expiration. Using a lung simulator, Cook et al compared the effect of resistive load on simulated tidal volume with 5 neonatal nasal CPAP systems. They found that, for infants < 1,000 g, there were no clinically meaningful differences between the CPAP systems. However, for infants > 1,000 g, the ventilator system may offer an advantage. As Black points out in his editorial, there are no major differences between the systems and it remains to be seen whether the differences noted by Cook et al have clinical relevance.

All modern ventilators are able to apply tube compensation, in which the ventilator automatically compensates for the resistance through the endotracheal tube or tracheostomy tube. Figueroa-Casas et al compared tube compensation to CPAP during spontaneous breathing trials in 118 adults. They found no difference in duration of weaning, rate of unsuccessful extubation, or duration of mechanical ventilation with the use of tube compensation. As Tanios and Epstein point out in their editorial, at present there is no convincing evidence that tube compensation is a superior mode for a spontaneous breathing trial. However, there may be some patients, such as those intubated with a small endotracheal tube, who might benefit from the use of tube compensation.

Thompson and St-Hilaire report the prevalence of COPD and tobacco use at a Veterans Affairs Medical Center. They found that the prevalence of COPD was consistent with that in other surveys. Smoking, age, and male sex were identified as significant risk factors for COPD, and the prevalence of active smoking remains high in this population of veterans. An important finding in this study was that 60% of the symptomatic smokers without a prior diagnosis of COPD were not evaluated with spirometry. As Soo Hoo points out in his editorial, under-utilization of spirometry is a gaping deficiency in the management of many patients with COPD.

Risk factors and prevention strategies for unplanned extubation have not been fully explored. Tanios et al conducted a multidisciplinary survey in an attempt to identify patients at high risk for unplanned extubation. Surveys were completed by respiratory therapists, critical care nurses, and critical care physicians. Perceived risk factors for unplanned extubation included absence of physical restraints, a nurse/patient ratio of 1 to 3, transport out of the

intensive care unit, light sedation, bedside portable radiograph, accidental removal of the nasogastric tube, and tugging on the endotracheal tube by the patient. Whether or not strategies to address these perceived risks are clinically effective in reducing adverse events remains to be determined.

Despite widespread use, there are few published data related to the physiologic impact of the use of an N95 filtering facepiece respirator on healthcare workers. Roberge et al found that, in healthy healthcare workers, an N95 mask did not impose any important physiological burden during 1 hour of use. However, the dead-space carbon dioxide and oxygen levels were significantly above and below, respectively, the ambient workplace standards. The presence of an exhalation valve did not significantly ameliorate the impact on P_{CO_2} .

Literature searches are essential to evidence-based respiratory care. Anders and Evans compared PubMed and Google Scholar search results for clinical topics in respiratory care. They found that PubMed was more practical to conduct efficient, valid searches for informing evidence-based patient-care protocols, for guiding the care of individual patients, and for educational purposes.

Modrykamien et al evaluated a number of potential predictors of pulmonary arterial hypertension in patients with idiopathic pulmonary fibrosis. They found that right-ventricle systolic pressure measured by echocardiography, six minute walk test distance, distance-saturation product, and SpO_2 performs poorly in detecting pulmonary arterial hypertension in idiopathic pulmonary fibrosis.

Measurement of functional residual capacity (FRC) has recently become commercially available during mechanical ventilation. Heinze et al evaluated the relationship between FRC, respiratory compliance, and oxygenation in mechanically ventilated patients after cardiac surgery. In mechanically ventilated patients after cardiac surgery, the authors found that FRC was influenced more by the ventilator settings than by physiologic variables.

Murgu et al, in their review, describe the indications, contraindications, and technique of flexible bronchoscopy during NIV. This is an area of likely increased use of NIV in the future.

In their special article, the report of a task force of the American Association for Respiratory Care, Barnes et al describe the competencies needed by graduate respiratory therapists (RTs) in 2015 and beyond. The task force identifies specific competencies to assure effective execution of RT roles and responsibilities in the years to come. This paper is important, as it helps with the roadmap for the future of the RT profession.

Kallet et al present a complicated case of acute respiratory distress syndrome (ARDS) from severe sepsis, in which the ratio of physiologic dead space to tidal volume (V_D/V_T) was measured prior to, during, and after therapy with human recombinant activated protein C. In a second case report published this month, Gilbert et al present a case of H1N1 influenza A viral infection complicated by alveolar hemorrhage. The Teaching Case of the Month, by Hayes et al, reports the case of a patient with dyspnea following lung transplant.