

There is now a very mature evidence base supporting use of noninvasive ventilation (NIV) in appropriately selected patients. We begin the October issue of *RESPIRATORY CARE* with the results of 2 surveys related to the use of NIV. These studies investigated the penetration of NIV use into everyday practice. My colleagues and I evaluated the frequency of and barriers to use of NIV for adult patients with acute asthma, chronic obstructive pulmonary disease (COPD), and congestive heart failure (CHF) in academic emergency departments (EDs). We found that NIV use is more common in the ED for acute COPD and CHF than for acute asthma. Barriers to greater use of NIV in the ED included physician familiarity, availability of respiratory therapists and equipment in the ED, and time required for NIV. Bierer and Soo Hoo evaluated the utilization of NIV in the Veterans Affairs (VA) health-care system. They report wide variability of NIV use in this setting. Unfortunately, they found underutilization of NIV and low rates of perceived efficacy. In his editorial, Chiumello explains that these 2 surveys, when taken together, show that physicians are less trained and familiar with NIV compared to respiratory therapists. This suggests an opportunity for respiratory therapists to instruct their physician colleagues on the benefits for NIV, which could lead to better patient outcomes.

Maximum inspiratory pressure (MIP) evaluates inspiratory muscle strength. It is commonly measured not only in the pulmonary function laboratory, but also in the intensive care unit, hospital wards, and clinics. This month we publish 2 papers related to predictive equations for MIP and maximal expiratory pressure (MEP). Sachs et al enrolled white, African American, Hispanic, and Chinese American participants, aged 45 to 84 years, and free of clinical cardiovascular disease in 6 United States cities. They report that more than 80% of adults can be successfully coached for 5 maneuvers, with repeatability within 10 cm H<sub>2</sub>O. They also report that race-specific reference equations for MIP are unnecessary. Evans and Whitelaw reviewed the recent literature and propose reference values and lower limit of normal values as a function of age for adults up to 70 years. These 2 papers differ in several ways, some of which are pointed out in the editorial by Petrini and Haynes. Evans and Whitelaw developed their reference equations by amalgamation, whereas the reference equations by Sachs et al come from direct measurements. Evans and Whitelaw provide reference equations for both MIP and MEP, whereas Sachs et al only provide such for MIP. Sachs et al used a straight mouthpiece to measure MIP, whereas Evans and Whitelaw included only studies that used a flanged mouthpiece. As shown by Petrini and Haynes, the reference equations reported in these 2 studies yield slightly different results. Additional work is needed to identify the best technique and the best reference equations for MIP and MEP.

Solomita et al determined the potential effects of humidification on the volume of airway secretions in mechanically ventilated patients. They compared non-heated-wire circuits, heated-wire circuits, and heat and moisture exchangers (HME). In their *in vitro* experiments, they found that water vapor delivery was greater using non-heated-wire circuits. In patients, airway secretion volume using humidification with non-heated-wire circuit was also greater. Presumably, the greater secretion volume was related to greater water vapor delivery. This study again makes the point that all humidification

systems are not created equal, and that heated wire circuits and HMEs may be suboptimal. The primary motivation for the use of heated wire circuits and HMEs is to maintain a dry circuit. However, the patient's respiratory tract may also be dry. What is unclear from this study is whether the results might have been different for higher temperature settings with the heated wire circuit and for different brands of humidifier and HME.

Lin et al report the results of an *in vitro* study to quantify the impact of accumulated humidity in a pressurized metered dose inhaler (pMDI) spacer in the ventilator circuit. They found that aerosol delivery from a pMDI with spacer during mechanical ventilation was greater with a dry spacer. The inhaled mass decreased by as much as 50% once the spacer was visibly saturated with humidity. As the authors acknowledge, the spacer used in this study is not designed to remain open between doses. Although other brands of inline spacers do remain open in the circuit, further work is needed to determine whether the results of this study can be generalized to other spacer devices.

Different nebulizer-compressor systems can result in different drug output, which may impact drug delivery and clinical efficacy. Bauer et al compared the aerosol properties of arformoterol delivered via 5 commonly used nebulizer systems for homecare. They report differences in arformoterol delivery between devices. Although these results provide some guidance in prescribing nebulized medications, the clinical importance remains to be determined.

Each year, the Journal hosts a symposium at the annual congress of the American Association for Respiratory Care. The title of the symposium at the 2008 congress was, "How to Read the Respiratory Care Literature." The presentations are by Associate Editors of *RESPIRATORY CARE*, and we are pleased to publish the related papers this month. As Chatburn indicates, the Internet has made finding evidence for clinical practice fairly easy. Many medical journals, including *RESPIRATORY CARE*, are now available online in full text. In addition, many different databases are available that can be searched with relevant key terms. Once a paper of interest is found, one needs to read that paper in a critical way. Tips for reading a scientific research paper are provided by Durbin. Many times you will be interested in reading a review paper rather than all of the original research papers that go into that review. Callcut and Branson describe how to read a review paper, particularly a systematic review that quantitatively pools data from individual studies for re-analysis. Although case reports are of minor importance in evidence-based medicine, they nonetheless make meaningful contributions to both knowledge and education. Pierson explains how to read a case report or Teaching Case of the Month. In the final paper from this symposium, Pierson discusses the challenges faced in translating knowledge into practice, and provides examples of its successful application in respiratory care. As a group, these papers provide a useful primer on how to read the respiratory care literature.

This month we publish 2 case reports. The first, by Uchida, reports 3 cases of late presentation of double aortic arch in school-age children presumed to have asthma. The second, by Hirani et al, reports 2 cases of acute respiratory distress syndrome in pregnant patients treated with airway pressure-release ventilation. The Teaching Case of the Month by Haghi et al describes a right paratracheal air cyst.