

This month's Editor's Choice is an observational study of long-term mechanical insufflation-exsufflation (MI-E) in subjects with neuromuscular disease. Chatwin and Simonds evaluated MI-E use in 181 adults over a 4-year time frame. They report that MI-E devices were most commonly provided to subjects with a cough peak flow (CPF) of < 160 L/min. Median settings were notable for an insufflation pressure on average 10 cm H₂O lower than exsufflation pressure. The inspiratory flow was set to 'high' in all subjects. Interestingly, subjects with a tracheostomy had the greatest adherence to treatment. Nearly all subjects were also receiving ventilatory support, and median duration of use was 17 months. Branson and Benditt provide commentary on the science of MI-E and the quest for optimum settings. The focus on CPF is misguided; the flow bias is the major determinant of secretion movement during MI-E.

Ceron et al evaluated the impact of speaking valves on ICU mobility in tracheostomized subjects. In a small cohort of subjects with a primary diagnosis of pneumonia, the Perme score was determined to evaluate mobility. Subjects had to be able to tolerate 30 min of speaking valve use to qualify for the trial. Subjects who tolerated speaking valve use had improved mobility compared to those who could not use a speaking valve. Roberts contributes an accompanying editorial detailing the strengths and weaknesses of the study. He notes selection bias and observes that mobility primarily included "up in the chair". He also points out that many of the advantages of a speaking valve might be provided simply by increasing PEEP.

Windmüller and colleagues evaluated physical exercise and CPAP in subjects after coronary revascularization in a randomized controlled trial. The control group started rehabilitation immediately post-op with breathing exercises and passive mobilization, progressing to active exercise, ambulation, and stair training. The intervention group added exercises on a cycle ergometer combined with CPAP on the 2nd to 4th post-op days. While the sample size was limited, the CPAP/cycle ergometry group had a shorter ICU length of stay.

Liu et al studied the stride-to-stride fluctuations during walking in subjects with and without COPD. Subjects walked on a treadmill for 3 min while gait variability and movement patterns were quantified. Control subjects had a more consistent organization of the hip and knee joint movement patterns compared to subjects with COPD. Control subjects also adapted to speed changes whereas subjects with COPD did not. The authors suggest that a reduced consistency in organization of movement patterns may be a contributing factor to falls experienced by patients with COPD.

Sakai and others evaluated CPF as an indicator of cough strength to determine if CPF was associated with aspiration risk. In a group of 82 subjects with community-acquired pneumonia, the authors studied CPF and performed videoendoscopic evaluation of swallowing and the repetitive saliva-swallowing test. The CPF for identifying the aspiration risk was 190 L/min. The authors suggest that CPF is an indicator of the aspiration risk when restarting food intake in elderly subjects.

Breath sounds remain a mainstay of pulmonary assessment in the patient with lung disease. Muñoz and colleagues evaluated the concordance for the discrimination of lung sound recordings in a group of experienced physiotherapists. Lung sound recordings were selected and validated by an expert panel and 11 recordings were played for participant recognition. A group of 69 therapists with a median of 4 years of experience were included. Concordance between physiotherapists in discriminating lung sounds was moderate. Interestingly, ability to recognize stridor was inversely associated to years of work experience.

The use of high-flow nasal cannula (HFNC) for O₂ delivery has been a major change in ICU care over the last decade. Tatsuishi et al compared HFNC to standard O₂ therapy in a randomized controlled trial of subjects following off-pump coronary artery bypass grafting (CABG). The primary endpoints were development of atelectasis, the total amount of O₂ administered, duration of O₂ therapy, and the need for postoperative diuretic therapy. Using HFNC shortened the duration of O₂ therapy, reduced the percentage loss of lung volume (atelectasis) and total amount of O₂ administered compared with standard O₂ therapy.

Aldhahir and others evaluated the perceptions of respiratory therapy administrators regarding effective teaching characteristics of clinical preceptors. The authors conducted a cross-sectional survey of administrators using a Likert scale covering the domains of professional competence, relationship with students, and personal attributes. Participants showed the most interest in the professional competence of clinical preceptors, followed by personal attributes and relationship with students. The authors conclude that role modeling and showing genuine interest in patients and their care were the most effective teaching characteristics of clinical preceptors.

Dos Reis et al evaluated upper limb function in COPD and normal control subjects using the 6-min ring board test (6PBRT). Reduced upper limb strength and endurance in COPD subjects was a common finding. During the testing, subjects were assessed by electromyography, near-infrared spectroscopy, and gas analyses. They found that the 6PBRT was performed at higher electrical activity in the accessory inspiratory muscles and a lower oxygenation profile in subjects with COPD. They conclude that ventilatory demand in the COPD group contributed to the poor performance.

Villalba and others performed an observational, cross-sectional study to define risk factors associated with reinstitution of mechanical ventilation in subjects weaned from prolonged mechanical ventilation. All subjects had received a tracheostomy and were followed for 28 days. The most common reasons for reinstitution of ventilatory support were sepsis and a neurologic comorbidity.

Vaz Fragoso et al evaluated FEV₁ as a standalone predictor for death in subjects ≥65 y old. In a group of over 4,000 subjects they found that in older subjects, the proportion of deaths attributed to reduced FEV₁ was best stratified by Z-score staging thresholds, as these yielded similar relative risks of death but at more age- and sex-appropriate prevalence of FEV₁ stage.

Li and others evaluated aerosol therapy during high frequency oscillation in an adult model. They compared jet and mesh nebulizers at different positions in the circuit. During high frequency gas delivery, the dose of aerosol was infinitesimally small (~ 2%). The mesh nebulizer resulted in improved aerosol delivery. These results give further caution to the utility of high-frequency oscillation/percussion, as there is little evidence base for its use and aerosol delivery is compromised.

Turcios provides an update on cystic fibrosis (CF). This review focuses on the lung pathology and summarizes new developments on the diagnostic approach of CF. Current therapeutic modalities, novel therapies targeting the basic genetic defect, and lung transplantation are also reviewed.

He and others provide a systematic review of the signs and symptoms of asthma. They included 67 studies with over 57,000 subjects. Asthma severity was dependent on a several symptoms, consisting primarily of wheezing, breathlessness, chest tightness, and cough. They suggest that a combination of symptoms be included in diagnostic-based questionnaires to aid early diagnosis.