regardless of the Glasgow Coma Scale score or type of tracheotomy and would have allowed many more patients to benefit from speaking valves.

Using manometry in our study (2) of 100 consecutive patients in a long-term acute care hospital, tube downsize was recommended for expiratory pressures above 5 or inspiratory pressure more negative than −3, speaking valve for expiratory pressures below 5, and capping/decannulation for capped inspiratory pressure 0 to −3 cm H_2O. Tube downsize occurred in 94 patients, speech within 2 days in 93, and capping in 11 before downsize and 71 after downsize. There were no instances of early intolerance of the recommendations. A tracheostomy care pathway that incorporates tracheostomy tube manometry, speaking valves, and downsizing expedites speech and decannulation. ■

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Reply: Speaking Valve Placement: Use Manometry and Downsizing

From the Authors:

Tracheostomy tube manometry is a promising approach for assessing patients' candidacy for speaking valves, capping, downsizing, and decannulation. We are grateful to Dr. Johnson for sharing his insight and data regarding this objective measure. Using tracheostomy tube manometry to assess inspiratory and expiratory intratracheal airway pressures is straightforward and efficient, providing valuable quantitative data that can guide care decisions. Although this approach is not widely used in the intensive care unit (ICU) setting, it may complement other assessments of preparedness for speaking valve placement. It may also help identify patients that will tolerate tracheostomy tube downsizing and/or readiness for decannulation as shown in patients in a long-term acute care hospital (1).

An open question is whether the predictive value of manometry observed in patients in a rehabilitation setting will be reliable in ICU patients soon after tracheostomy. Additional limitations to the study by Johnson and colleagues are the retrospective design, absence of a control group, and lack of data regarding time from tracheostomy to speech valve trials. Our study investigated placement of speech valves in mechanically ventilated patients within 24 hours of the initial tracheotomy surgery, a window during which the postoperative recovery from a procedure and residual sedation differs markedly from that during rehabilitation. In addition, in the ICU setting, tracheostomy tube manometry may have less of a role, as a decrease in expired tidal volume (i.e., ventilator delivered vs. returned) during cuff deflation demonstrates adequate or inadequate airflow to the upper airway.

Although using a single measure to determine candidacy for speech valve placement is attractive, tube manometry does not obviate the need for a comprehensive speaking valve evaluation. Patients undergoing tracheostomy placement are often deconditioned and remain dependent on ventilator support for adequate gas exchange. Such patients frequently only tolerate brief speaking valve trials, and the assessment of tolerance requires a speech-language pathologist at the bedside. As respiratory function, secretion management, and mental status improve, patients may tolerate longer trials of speaking valve. In this setting, tube manometry may provide important guidance in determining when a smaller tracheostomy tube is needed or a cuffless trach is possible. In addition, tube manometry may also be informative in patients with a low Glasgow Coma Score who are unable to communicate respiratory discomfort.

In future studies, including tracheostomy tube manometry may provide a quick and objective assessment of candidates for early speaking valve intervention. However, we suggest this measurement be used to supplement other important assessments of a patient's readiness rather than replacing a comprehensive evaluation by a trained speech-language pathologist.

Last, although we only briefly addressed capping and decannulation during our study, further research is needed to determine if earlier speaking valve use expedites decannulation. Several studies (2, 3) have provided guidelines for capping, and tracheostomy tube manometry could be used to further refine such algorithms. We thank Dr. Johnson for illuminating the potential role of tracheostomy tube manometry in this population. ■

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No Place Like Hospital: Initiation of Home Noninvasive Ventilation in Hypercapnic Chronic Obstructive Pulmonary Disease

To the Editor:

I read with great enthusiasm the American Thoracic Society (ATS) Guidelines and the summary for clinicians about home noninvasive ventilation (NIV) in stable hypercapnic chronic obstructive pulmonary disease (COPD) (1, 2). I would like to thank the experts for providing guidance regarding how to implement home NIV in everyday clinical practice. The Guidelines do recommend NIV initiation in patients with a recent hospitalization because these patients are at high risk for rehospitalizations and mortality. They recommend NIV initiation 2–4 weeks after discharge and resolution of the acute respiratory failure. This recommendation is driven mainly based on findings of the landmark trial by Struik and colleagues (3). The study recruited 201 patients with COPD with forced expiratory volume in 1 second % predicted <50% hospitalized with acute hypercapnia respiratory failure. Eligible participants were patients with persistent hypercapnia (average arterial carbon dioxide tension/pressure of 59 mm Hg) but normal pH 48 hours after ventilatory support was discontinued, which indicates transition from acute-on-chronic to chronic respiratory failure. Study participants were randomized to NIV or standard of care and underwent NIV initiation during the hospital stay. The average expiratory positive airway pressure and inspiratory positive airway pressure were 4.8 and 19.2 cm H_2O, respectively. There was no difference in hospitalizations or mortality rates at 1 year between NIV and standard of care. This is the only recent well-conducted large randomized controlled trial showing no benefit from home NIV with high inspiratory positive airway pressure–expiratory positive airway pressure difference. A nonoptimal randomization may be the reason for those findings, as the intervention group included sicker patients (53% of the participant taking oral steroids) than the participants in the control group (38% of them taking oral steroids). Study participants in both arms may not have had severe disease despite poor lung function, as the median exacerbation rate before their enrollment was two as opposed to three exacerbations per year in Murphy and colleagues' trial (4). The authors assumed that their cohort of patients with presumable acute-on-chronic hypercapnic respiratory failure may have been "diluted" with those who had transient hypercapnia due to acute respiratory failure as arterial carbon dioxide tension/pressure normalized in 26% of participants after 3 months. The rationale of the ATS Guidelines not to initiate NIV during a hospital stay presumes that it is difficult to distinguish between a transient acute hypercapnic respiratory failure and an acute-on-chronic hypercapnic respiratory failure. Patients with chronic hypercapnic respiratory failure are likely those patients with COPD who benefit from home NIV. However, there are often data from previous encounters (e.g., arterial blood gases) to confirm whether the patient is experiencing an acute versus acute-on-chronic hypercapnic respiratory failure. Hospital stay is thus the ideal time to initiate NIV because the patient has the chance to try the equipment for two to three nights under the supervision of the healthcare professionals and address issues with its use. Patients with COPD who experience a near fatal event and received NIV as treatment for it may be more willing to consider home NIV for the outpatient care of their COPD. In addition, discharging the patient and scheduling a follow up does not guarantee the appropriate follow up will take place. Patients may have another acute exacerbation of COPD (AECOPD)-related hospitalization before the follow up. Moreover, 75–80% of patients hospitalized with hypercapnic respiratory failure due to AECOPD have persistent hypercapnia 6 weeks after discharge (4, 5), and hypercapnia is a strong predictor of rehospitalization (6). Thus, the hospital is potentially the ideal place to initiate home NIV in patients hospitalized with acute-on-chronic hypercapnic respiratory failure owing to AECOPD if there is sufficient data to confirm that the patient has chronic hypercapnic respiratory failure. ■

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