Capping or Suctioning for Tracheostomy Decannulation

TO THE EDITOR: Hernández Martínez and colleagues (Sept. 10 issue)1 report accelerated decannulation with a protocol based on the frequency of airway suctioning plus continuous high-flow oxygen therapy. Their findings have implications for hospital utilization and the incidences of pneumonia and tracheobronchitis; however, there are caveats related to the design and generalizability of the trial findings.

The authors based their capping protocol on our previous study2; however, our protocol involved downsizing to 4.0-mm inner-diameter tracheostomy tubes. This downsizing greatly reduces resistance during capping. In the trial conducted by Hernández Martínez et al., the proportion of patients in the control group in whom the capping trial failed (73.3%) probably reflects the lack of downsizing. This deviation potentially delayed the time to decannulation.

Also, because the trial excluded patients with anatomical alterations to the airway, including 59 patients who underwent otolaryngologic surgical interventions, the trial implications are unclear for patients with vocal-fold paralysis, airway stenosis, swallowing impairments, or edema and for those who are receiving treatment for cancer. Such anatomical alterations are often occult unless they are explored with upper-airway endoscopy.3 Further investigation is needed to illuminate the applicability of the trial findings to diverse patient populations.

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No potential conflict of interest relevant to this letter was reported.


DOI: 10.1056/NEJMcm2031385

TO THE EDITOR: Hernández Martínez et al. describe an approach to overcome obstacles in tracheostomy decannulation. We agree with the authors that a 24-hour capping trial sets an often unnecessarily high bar. However, the size of the tracheostomy tube used in the trial may have skewed the results in favor of the intervention group.

Although there is no universal agreement regarding a decannulation protocol, some investigators have suggested downsizing to a 4-mm inner-diameter tracheostomy tube1 in order to minimize the degree of tracheal obstruction intrinsic to an in situ capped tube. The protocol in this trial involved a 7-mm inner-diameter cuffed tracheostomy tube that corresponded to an outer area of 74 mm². The lower limit of the normal tracheal area is 130 mm² in men and 78 mm² in women,2 so the 74-mm² cross-sectional tracheal area occupied by this tube when capped will reduce the functional area of the trachea below the 50-mm² threshold for dyspnea3 in many patients and may lead to capping failures. Can the
authors comment on the role of cannula down-sizing in the decannulation process?

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No potential conflict of interest relevant to this letter was reported.


DOI: 10.1056/NEJMc2031385

TO THE EDITOR: The importance of continuous high-flow oxygen therapy in the trial conducted by Hernández Martínez et al. needs to be carefully studied. Also, the tracheostomy tube itself may cause excess airway secretions. The clearance of these secretions from the lower airway is restored only after decannulation because the tracheostomy tube is a foreign body that is a source of irritation in the trachea and inhibits the ability to cough effectively. The warming of incoming air by the upper airways is superior to that with a tracheostomy tube.¹ Can the authors comment on the role of the tracheostomy tube in decannulation failures?

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DOI: 10.1056/NEJMc2031385

THE AUTHORS REPLY: As noted by Pandian et al. and Thiboutot and Feller-Kopman, capping trials abruptly reduce the effective cross-sectional area of the airway, so a smaller tracheal cannula should be used during such trials. If the trial is conducted outside an intensive care unit (ICU), reconnection to mechanical ventilation may not be possible. Even in the ICU, a tracheal cannula with a small diameter makes both spontaneous breathing and mechanical ventilation difficult.

Characteristics of the tracheal cannula other than internal and external diameters can modify the effective airway in patients with a tracheostomy tube. We used cannulas with either fenestrations and low volume and low pressure or elastic cuffs to perform our capping trials. This approach enlarges the effective airway area for spontaneous breathing.¹

We thank Tretiakow et al. for pointing out the role of the tracheostomy tube in decannulation failure. In our opinion, the tracheal tube is a foreign body that can induce cough and limit effective clearance of secretions. Moreover, dry and cold gases can irritate the respiratory mucosa and lead to excess airway secretions. In our trial, we deflated the cuff while the patient was off the ventilator during weaning, we limited tracheal manipulations (e.g., by minimizing cannula changes or tracheal aspiration), and the patient received continuous high-flow oxygen while disconnected from the ventilator.² Our protocol did not allow us to draw conclusions about the specific role of high-flow oxygen in our observed outcomes.

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Since publication of their article, the authors report no further potential conflict of interest.


DOI: 10.1056/NEJMc2031385