



## Intubation and extubation of patients with a heat and moisture exchanger attached to the endotracheal tube in patients with COVID-19

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### To the Editor,

Coronavirus disease (COVID-19), transmitted mainly through droplets and aerosols,<sup>1</sup> is highly contagious and places healthcare providers at risk of cross-infection during aerosol-generating airway procedures.<sup>2</sup> Hence, precautions have to be taken during intubation and extubation. At our institution, the previous practice was to clamp the endotracheal tube during these procedures. During intubation, the clamp was released after the cuff was inflated and the breathing circuit connected with the heat and moisture exchanger (HME) attached to the endotracheal tube. The description by Jacob *et al.*<sup>3</sup> of the technique of clamping the tube to reduce aerosolization featured the use of a disposable plastic clamp; we used sponge-holding forceps as they are easily available in the operating room. Nevertheless, we found that clamping could damage the endotracheal tube and result in kinking during the intraoperative period, which may remain unnoticed under the drapes and result in high airway pressures. Further, a recent letter to the editor published in this *Journal* expressed concern regarding a risk of negative pressure pulmonary edema in patients breathing spontaneously against a clamped endotracheal tube and cautioned that aspiration of supraglottic contents caused by increased respiratory effort with an obstructed airway could increase the incidence of ventilator-associated

pneumonia.<sup>4</sup> Such complications could be catastrophic in an already hypoxic patient with COVID-19.

Thus, we suggest an alternative technique to reduce the spread of COVID-19 during airway management, namely to use HMEs connected to the endotracheal tube during intubation and extubation (**Figure**). Heat and moisture exchangers are effective viral and bacterial filters. Our national Society of Anaesthesiologists recommends the use of two HMEs to prevent contamination of the breathing circuit and the anesthesia machine.<sup>5</sup> This is also intended to help avoid cross-infection among patients. But instead of connecting the HME *after* intubation, we are now connecting it to the endotracheal tube *before* intubation. HMEs also can be used between the face mask and breathing circuits during preoxygenation. Following intubation, the cuff is inflated and the breathing circuit is connected to the HME.

Heat and moisture exchangers could render intubations more difficult because of their weight, which in our experience can be overcome by practice. Moreover, an assistant can support the HME to make endotracheal tube insertion easier. During extubation, we remove the endotracheal tube along with the connected HME.

We acknowledge that the use of videolaryngoscopy with deep neuromuscular blockade is recommended to improve first pass success and avoid coughing during intubation of COVID-19 patients.<sup>5,6</sup> The use of a stylet improves the ease of intubation with videolaryngoscopes; the use of HMEs as described here precludes the use of a stylet. Nevertheless, in resource-poor countries, it is rare to have videolaryngoscopes available for all patients, and most of the intubations are performed with Macintosh laryngoscopes where the above technique can be employed. To maximize success, we also recommended

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**FIGURE** Intubation of a patient (who consented to the publication of this image) with a heat and moisture exchanger attached to the endotracheal tube

that the senior-most available anesthesiologist perform the intubation.

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