

the appropriate use and availability of suitable PPE, as well as the increasing availability of tracheal intubation guidelines during the pandemic [3].

To determine the extent to which performing tracheal intubation directly exposes healthcare workers to the risk of contracting COVID-19, staff isolation, serial testing and immunophenotyping of staff and their respective patients would be required which will ensure both validity and accuracy of any association. This challenging study could be considered for future research to provide us with a definitive answer, but in the absence of such data, large-scale studies such as the intubateCOVID project represent the highest level of evidence in the COVID-19 pandemic to date.

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One-lung ventilation during the COVID-19 pandemic

We read with interest the recommendations provided by Thornton et al. [1] and thank the authors for their excellent and timely work. We would like to add some comments, having adapted our technique over the course of treating > 100 patients during the COVID-19 pandemic.

We assemble the double-lumen tube with two paediatric ClearTherm 3 heat and moisture exchange (HME) filters (Intersurgical Ltd., Wokingham, UK) attached to the catheter mounts before anaesthesia in addition to a standard HME filter at the distal end of the catheter mount (Fig. 1). There is no increased resistance within the circuit when these extra HME filters are added and they serve two purposes. First, they make the circuit symmetrical, with less likelihood of kinking. Second, because they are sited proximal to the patient's airway, accidental disconnection of any parts of the circuit should not result in aerosol generation within the operating room. Using two clamps eliminates potential contamination from the patient's lungs and we can isolate parts of the circuit in order to insert and remove in line suction as needed, rather than using standard suction catheters, with their inherent risk of aerosol generation.

Thornton et al. state that a flexible bronchoscope should be used to check double-lumen tube positioning

following tracheal intubation and after positioning the patient laterally. They write that clinical confirmation of double-lumen tubes is associated with a malposition rate of up to 35% and quote two references, one of which was a study involving a single anaesthetist whose thoracic experience was unknown [2] and the other a review that quoted the study [3]. Use of a bronchoscope risks generation of aerosols because the port through which the bronchoscope is introduced is not airtight. We, therefore, check the position of the double-lumen tube clinically utilising intermittent clamping and a stethoscope, and have only had to use a bronchoscope in 20% of cases, where tube positioning was considered incorrect. However, if tracheal intubation is likely to be difficult, we use the Vivasight DL (ETView Ltd., Amsterdam, The Netherlands) with an inbuilt camera Ambu® aView™ (Ambu Ltd., St. Ives, UK). This is integral and, unlike a standard bronchoscope, does not result in aerosol generation. We have used this technique successfully in four patients.

Not mentioned in the guidelines is the importance of using a pressure manometer to check both tracheal and bronchial cuff pressures immediately after insertion of the double-lumen tube and cuff inflation. Finally, Thornton



Figure 1 Two paediatric heat and moisture exchange filters assembled on the double-lumen tube

et al., in recommendation 6, state that “the double-lumen tube should only be open to the atmosphere after allowing release of positive pressure within the lung”. We believe the airway should not be open to the atmosphere at any time because even after deliberate lung collapse, there is still the possibility of aerosol generation due to cardiogenic oscillations [4] and surgical manipulation of the lung.

During the COVID-19 pandemic, it is vital that aerosol-generating procedures, such as one-lung ventilation, are performed with utmost safety. We welcome the recommendations by Thornton et al. and believe the adaptations we have described improve safety even further.

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