

transferring infected children on high-flow oxygen therapy because of the risk of aerosolisation. A closed-circuit transport ventilator with a HEPA filter attached is used instead of BVM to transfer an intubated child to reduce the risk of aerosolisation. The patient should be adequately sedated and paralysed to prevent coughing or dislodgement of the tracheal tube en route. The receiving team should be aware of the patient's arrival and have donned full PPE before handover. After transfer, the route taken and lifts used are disinfected immediately.

### Declaration of interest

The authors declare that they have no conflict of interest.

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## Percutaneous tracheostomy in patients with COVID-19: sealing the bronchoscope with an in-line suction sheath

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Editor—Tracheostomy represents a particular challenge during the coronavirus disease 2019 (COVID-19) pandemic in patients infected with SARS-CoV-2. It is an aerosol-generating procedure with significant infection risk to surgeons, anaesthetists, and theatre staff. Open surgical tracheostomy and percutaneous dilation tracheostomy have differences in terms of aerosol generation. While the choice of technique is beyond the scope of this letter, the surgeon or intensivist performing the tracheostomy should use the technique with which they are most accustomed to reduce risk.

Early on percutaneous dilation tracheostomy was performed using multiple sequential dilators over a guidewire. Over the years, two major advances were introduced: use of a

single dilator and use of an intubating bronchoscope down the tracheal tube.<sup>1</sup> The latter is, in our view, an indispensable tool to allow safe percutaneous dilation tracheostomy. The bronchoscope allows visualisation of the needle, its correct positioning in the midline, and avoidance of the posterior tracheal wall, injury of which can lead to false passages and tracheo-oesophageal fistula with potentially disastrous consequences.<sup>2</sup> The main drawback to using a bronchoscope in COVID-19 patients is the increased risk of aerosolisation from the insertion point of the bronchoscope at the tracheal tube connection (catheter mount with suction window). We describe a closed, in-line suction system to seal the bronchoscope and reduce the risk to operators and staff.

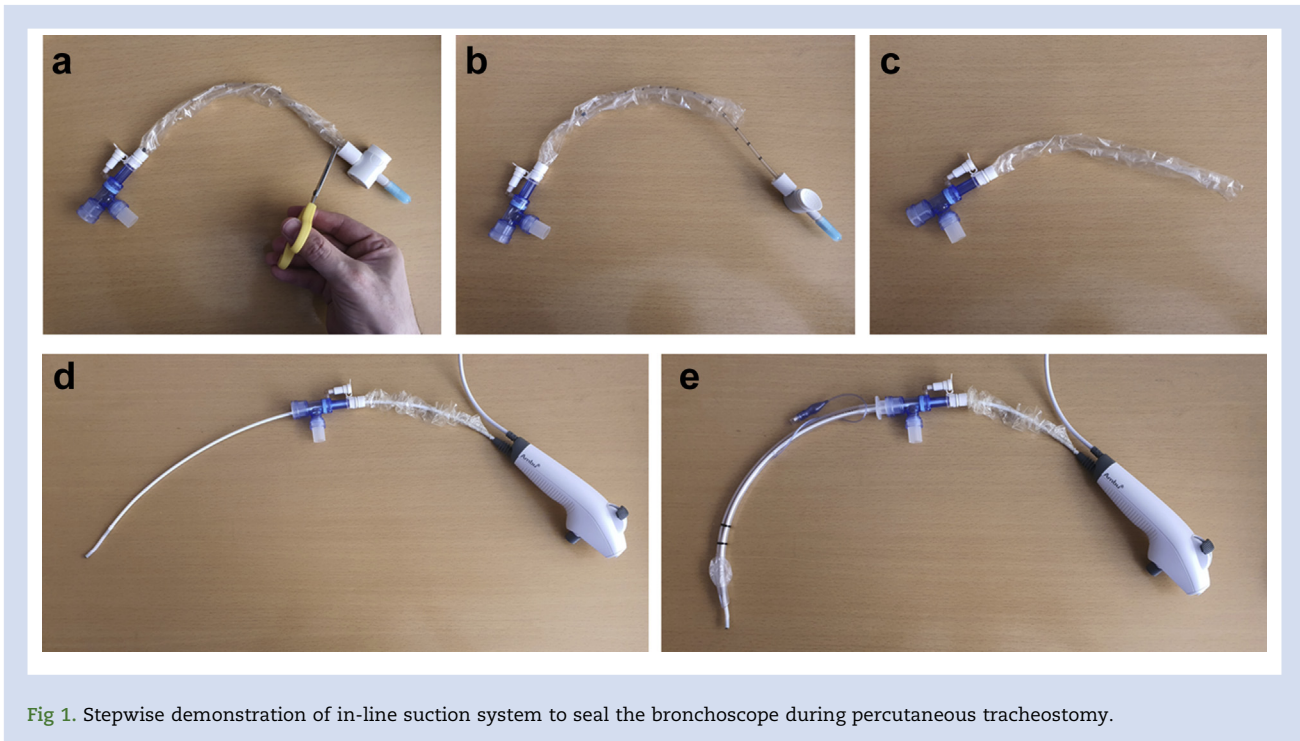


Fig 1. Stepwise demonstration of in-line suction system to seal the bronchoscope during percutaneous tracheostomy.

Our technique utilises the sheath of a 12F closed in-line suction system (Halyard Health Inc, Atlanta, GA, USA). The sheath needs to be circumferentially cut at the suction-valve end of the system (Fig 1a) with particular attention paid to maintain integrity of the sheath. The suction catheter is removed (Fig 1b and c) and a single use videobronchoscope (Ambu® aScope™, Ambu A/S, Ballerup, Denmark) is advanced through the sheath and the one-way valve. The sheath is then tightly taped around the proximal end of the bronchoscope shaft using a Tegaderm™ (3M Healthcare, Neuss, Germany) film dressing or similar tape (Fig 1d). Length and mobility of the sheathed segment of the bronchoscope need to take into account the length of the tracheal tube, and this can be tested using an identical tracheal tube away from the patient (Fig 1e). The anaesthetist is asked to withdraw the tracheal tube until the cuff sits at or just below the glottis so as to avoid cuff puncture and to reduce duration of the procedure. This should be performed using a videolaryngoscope to protect the anaesthetist from aerosol. The patient should be pre-oxygenated and the ventilator turned off allowing enough time for passive expiration via an open adjustable pressure-limiting valve. The catheter mount can then be replaced with the mounted bronchoscope and the ventilator

connected via the side port. Ventilation can commence until the start of the percutaneous dilation tracheostomy procedure. To minimise the period during which aerosol might be generated, we perform a small skin incision before needle insertion.

We believe our modification offers an extra level of safety, not only for the operator of the bronchoscope, but other staff present during the procedure.

### Declarations of interest

The authors declare that they have no conflicts of interest.

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