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## Reducing droplet spread during airway manipulation. Reply to Au Yong and colleagues (*Br J Anaesth* 2020; 125: e176–e178)

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Editor—The coronavirus 2019 (COVID-19) pandemic has sparked innovation in infection control, drawing focus to the management of aerosol-generating procedures for the anaesthetist.<sup>1</sup> We read with interest Yong and colleagues<sup>2</sup> use of a plastic tent or sheet to reduce droplet spread during airway manipulation. The authors state that the main aim of a plastic tent or sheet is related to the patient coughing or gagging on intubation, and therefore possible viral spread. All recent COVID-19 guidelines recommend rapid sequence induction and intubation for securing the airway.<sup>3–6</sup> If a patient is fully paralysed, the patient will not cough or gag; to do so would reflect poor anaesthetic technique.

The tent method also has various limitations. The tent creates a reservoir of droplets. With the raised poles supporting the structure, the process of dismantling and disposal of the plastic sheet may risk contamination and viral transmission. It may not be applicable for children and patients who are anxious or claustrophobic. They mention that the tent is tall enough to allow a bougie in. If the initial laryngoscopy with a stylet-loaded tracheal tube fails, then switching to the use of a bougie may entail lifting up of the tent cover which may cause air currents that spread viral aerosol. The plastic sheet method (taped down at the sides) also compounds airway management by limiting the space available to both the intubator and assistant. Any barrier, whether a plastic sheet or one of the many intubating boxes

proposed, may interfere with crisis management such as difficult intubation, crash Caesarean section, cardiopulmonary resuscitation, etc. The authors have also not provided any evidence that their technique minimises contamination, as presented by other authors including using fluorescent resin powder viewed under ultraviolet light during simulated aerosol production.<sup>7</sup>

We do not recommend leaving the plastic sheet *in situ* for the entire duration of the operation because of the risk of viral transmission via fomites. The plastic sheet can be easily and safely disposed of by simply folding down, keeping the contaminated surfaces opposed, into a smaller size, rolling into a bundle, or both. It should be discarded immediately after intubation as per local infection control measures.

Emergence and extubation should be undertaken with great caution because of the risk of coughing and of aerosolisation. The authors' plastic sheet technique is intended to protect the operator, but it fails to prevent patient and work surface contamination including the patient's chest and overlying gown or surgical drapes. The use of a three-layered plastic drape configuration by Matava and colleagues<sup>7</sup> during a simulated cough is more successful in this respect. The authors also use a small hole cut into the plastic sheet to allow passage of the tracheal tube and breathing circuit tubing. However, the hole remains open, allowing virus transmission. Patino Montoya and colleagues<sup>8</sup> proposed taping and sealing the hole to the tracheal tube. At extubation, both the tube and plastic sheet can be lifted away as a unit and discarded. However, other

guidelines have advised caution using a plastic sheet for extubation, as it may inadvertently increase self-contamination.<sup>3</sup>

During extubation, other options to minimise coughing include administering i.v. opioids, lidocaine, or dexmedetomidine,<sup>10</sup> and deep extubation if safe to do so. Antiemetics should also be given to reduce the risk of vomiting and possible viral spread.<sup>5</sup>

The authors' use of a Hudson's mask (with the holes taped using an occlusive dressing) as a shield for droplet dispersion may result in significant carbon dioxide rebreathing, especially if the oxygen flow rate is set at  $<5 \text{ L min}^{-1}$  (to minimise aerosolisation). Rebreathing, together with hypoventilation from opioids and anaesthetics, may cause significant hypercarbia and should be avoided in COVID-19 patients with pneumonia and diminished respiratory reserves. It would be better to re-use the previously applied face mask (during preoxygenation), to conserve resources and avoid carbon dioxide rebreathing. After extubation, if required, low flow oxygen therapy via either a nasal cannula or a standard Hudson's mask can be administered, with a surgical mask placed over these devices to minimise viral transmission.

There are limitations to the use of the plastic sheet that should be recognised, even though it is readily available, cost-effective, and easily applied. In conclusion, we concur with the use of a plastic sheet to limit droplet dispersion for aerosol-generating procedures in COVID-19 patients. However, careful consideration is needed in striking a balance between reducing environmental contamination and protecting healthcare workers, while simultaneously delivering safe care for patients.

## Declarations of interest

The authors declare that they have no conflicts of interest.

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# A multipurpose portable negative air flow isolation chamber for aerosol-generating procedures during the COVID-19 pandemic

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