To the Editor:

The coronavirus disease 2019 (COVID-19) pandemic has raised awareness throughout the medical community to concerns of aerosolized contagion. Compounding the concerns for exposure are the shortages of personal protective equipment faced by clinicians and auxiliary staff such as nurses and respiratory therapists. As such, many institutions have not only adjusted clinical protocols but have begun to use commonly available equipment in an effort to reduce exposure. Barrier enclosure devices have been described and tested for this purpose for the intubation process for use in patients suffering acute respiratory failure due to COVID-19 (1). As patients recover, we face a new battle for minimizing exposure, now during extubation. The extubation process includes not only the handling of contaminated equipment from the oropharynx of the patient but is also commonly accompanied by coughing which is known to aerosolize secretion particles (2). In this letter, we describe a barrier method that can be easily implemented to help protect those caring for patients during an extubation. We illustrate a multiple checkpoint barrier method with commonly found materials, to help contain as much droplet and aerosolized particulates as possible; a non-rebreathing (NRB) mask, face shield, and a clear plastic drape are implemented.

In our protocol (Video 1, sequence 1 [Supplemental Digital Content 1, http://links.lww.com/CCX/A234]), equipment is first gathered: scissors, a translucent plastic sheet, chuck, face shield, NRB mask, and a syringe to deflate the endotracheal tube (ETT). The patient is preoxygenated with 100% oxygen. A plastic drape is then placed over the patient's face, covering the nares and mouth, followed by cutting the tape which secures the oral-gastric tube (OGT) to the ETT. Next, the OGT is withdrawn halfway to ensure that when the ETT is removed, the OGT follows by approximately the same distance. A NRB mask is positioned over the patient's forehead, followed by similarly positioning a face shield, if available. The airway and oral cavity are then suctioned, all the while keeping the barrier drape intact. Next, the ETT securing device is removed. Once all the above steps are complete, only then is the ventilator turned off, and then the ETT balloon deflated. The ETT and OGT are removed in order to complete the extubation. The ETT and OGT may be handled from above the plastic drape (preferred, as seen in sequence 1) or from under the drape while avoiding any excess raising of the drape itself. OGT, ETT, and ancillary items are pulled into the drape then efficiently wrapped within the barriers provided. This, in combination with having maintained the contaminated items within the drape and chuck, is proposed to minimize direct exposure to the providers.

We performed a simulation to illustrate the distribution of particles in standard extubation practice (Video 1, sequence 2 [Supplemental Digital Content 1, http://links.lww.com/CCX/A234]) and in our protocol encompassing our barrier techniques (Video 1, sequence 3 [Supplemental Digital Content 1, http://links.lww.com/CCX/A234]). Immediately following the standard extubation, examination with ultraviolet light showed particulates present on the providers' gown and multiple other places in the room including on the floor, bed, and mechanical equipment (Video 1, sequence 2 [Supplemental Digital Content 1, http://links.lww.com/CCX/A234]). When extubation by barrier techniques was carried out and examined with ultraviolet light (Video 1, sequence 3 [Supplemental Digital Content 1, http://links.lww.com/CCX/A234]), particles were noted to be confined to within the NRB mask. No particles were present on the provider or other equipment within the room.

Some limitations exist. Aerosolized particles were limited to the evaluation of ultraviolet light fluorescing the particulates. Nevertheless, given the observations described in this letter, we suggest that our barrier extubation protocol be considered in patients who have highly transmissible respiratory illness to minimize risk of exposure.

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