

Use of a Modified System for Manual Ventilation of the Patient for In-Hospital and Extra-Hospital Transport to Avoid Aerosolizing Spread of Droplets During COVID-19 Outbreak

To the Editor

We read with great interest the open mind of Abd-Elseyed and Karri,¹ which highlights the fact that health care workers continue to be at particular risk for the shortage of personal protective equipment. In our experience, this does not just happen in the poorest countries.

In Italy, as of April 16, 2020, there are 16,650 healthy workers infected by Coronavirus Disease 2019 (COVID-19). To date, 127 doctors have died as documented by Italian Higher Institute of Health. Our Italian experience, as described by Nacoti et al.,² suggests that hospitals become a major source of COVID-19 carriers as they are populated by infected patients who transmit the virus to uninfected patients and health care workers when medication, mechanical ventilators, and personal protective equipment

are not available. Asymptomatic or presymptomatic health care workers also become vectors.

We report our experience and illustrate our idea that has allowed us to create, using the available material, a safety device aimed at minimizing the spread of droplets for in-hospital and extra-hospital transfers of COVID-19 patients. On March 31, a patient with COVID-19 and intestinal ischemia presented to the San Salvatore Academy Hospital, L'Aquila, Italy. After surgery, he was transferred to the COVID Intensive Care Unit located in a pavilion outside the hospital. The problem arose from the lack of a portable ventilator. During the transfer, we provided manual ventilation using the DAR reservoir bag (Medtronic, Minneapolis, MN). We added a high-efficiency particulate air filter but felt it was more effective to place the filter on the expiratory exit of the DAR reservoir bag and not between the latter and the endotracheal tube as was described by Liew et al.³ We used a filter called "DAR Adult Electrostatic Filter" that provided antibacterial and antiviral filtering $\geq 99,999\%$.⁴ In this way, we were able to position a surgical mask on the filter, which deterred a possible spread of droplets and was psychologically more comfortable to the health care worker by minimizing his contact with the flow of air leaving the reservoir bag (Figure). We feel that the presence of the surgical mask over the filter

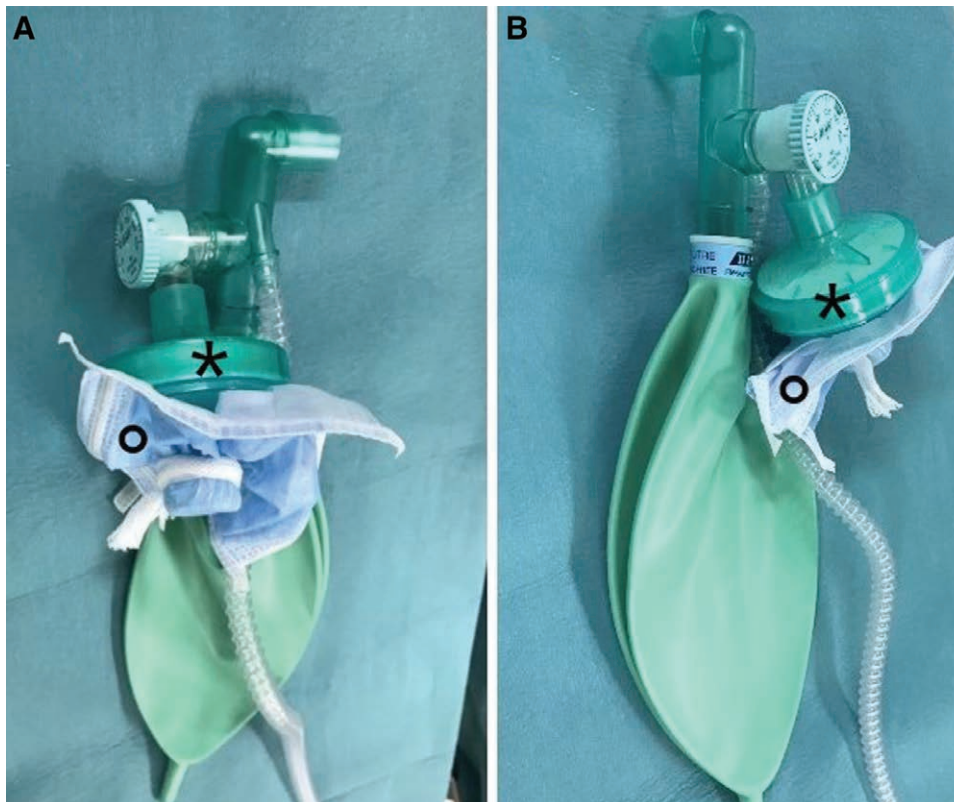


Figure. DAR reservoir bag, with DAR filter at the expiratory exit of the bag, on which the surgical mask is placed. A and B, *Filter on the expiratory exit of the DAR reservoir bag. ○Surgical mask fixed on the filter with hemmed bandage.

provides extra safety. Clearly, there is a need for scientific data on the reduction of aerosolization during the transport of manual ventilating patient brought about by our craft device; our perception, however, is encouraged by literature data showing that any kind device, even homemade ones, would be better than no protection in reducing aerosol exposure.⁵

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