Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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High-flow tracheal oxygen in tracheostomised COVID-19 patients

Dear Editor,

Since the emergence of Coronavirus disease 2019 (COVID-19), over 2.5 million have been infected worldwide. Thousands are hospitalized in intensive care units and as much as 75% of them require mechanical ventilation (MV) [1]. Due to the nature of the disease, which is characterized by a prolonged course, significant proportion of ventilated patients may need extensive ventilatory support. Tracheostomy is a widely used intervention in patients with acute respiratory failure and prolonged ventilation. In this population, tracheostomy reduces sedation requirements, improves patient comfort, reduces ventilator-dependent days and length of hospital stay [2,3]. These effects may be extremely important in an overwhelmed health care system suffering from a shortage of ventilators and capable medical personnel. Indeed, tracheostomy was the most common surgical procedure performed during the severe acute respiratory syndrome (SARS) epidemic in 2003 [4]. Its merits in the current COVID-19 pandemic still need to be proven in clinical trials.

The liberation of tracheostomised COVID-19 patients from MV is especially challenging. The use of open suction systems and tracheal oxygen masks over the tracheostomy cannula may significantly increase aerosol generation and jeopardize healthcare workers. Recent guidelines recommend keeping the cuff inflated, using in-line suction, and avoiding of humidified oxygen [3].

Heated humidified high-flow oxygen provided through the tracheostomy cannula was previously shown to improve work of breathing, assist ventilation and oxygenation and may be useful for ventilator weaning [5–7].

In order to mitigate the hazards of aerosol generation and enable usage of the closed suction system, we are successfully using a closed system presented in Fig. 1. The system is composed of a commercially available unit which warms and humidifies high flow air/oxygen blends, connected to closed suction system and antiviral filter. We tested the system using a test lung and a FlowAnalyser PF-300 (Imtmedical©, Buchs, Switzerland). While the high flow oxygenation device was set to a flow of 40LPM, we measured flow of 39.2LPM and positive end-expiratory pressure of 2.1cmH_2O in the test lung (Fig. 1).

This closed system requires minimal staff handling and circuit opening, thereby increasing staff safety and facilitating patient weaning. To our best knowledge, this is the first report of safe usage of high-flow tracheal oxygen in COVID-19 tracheostomised patients.

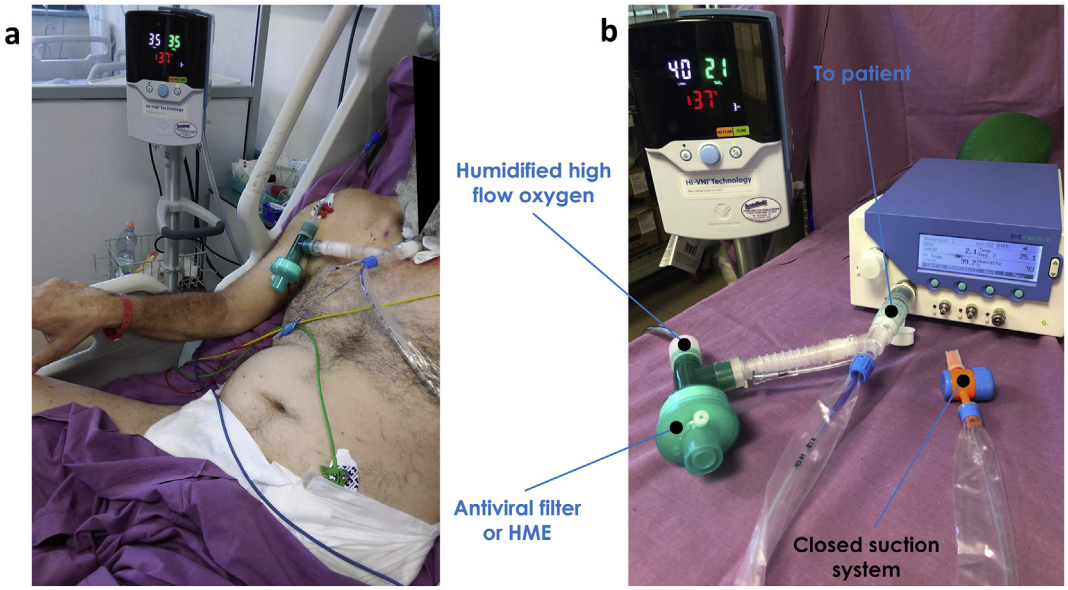

Fig. 1. (a) The system is connected to a tracheostomised COVID-19 patient and High Velocity Nasal Insufflation device, Hi-VNI® (Vapotherm, New Hampshire, US). (b) The system connected to a high flow oxygenation device, test lung and a FlowAnalyser PF-300 (Imtmedical©, Buchs, Switzerland). HME - Heat and Moisture Exchanger.

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Declarations of Competing Interests

Danny Epstein, Asaf Miller, Ronny Ben-Avi and Moshe Matan declare that they have no conflict of interest.

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