



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.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Anaesthetic management of patients with COVID-19: infection prevention and control measures in the operating theatre.

Comment on *Br J Anaesth* 2020; 125: e239–e241

Sudeep Saxena* and Chandra M. Kumar

Singapore

*Corresponding author. E-mail: sunny4442@hotmail.com

Keywords: anaesthesia; COVID-19; guidelines; infection prevention; tracheostomy

Editor—We read with great interest the case report by Wong and colleagues¹ on coronavirus disease 2019 (COVID-19) infection prevention and control measures. There was an exponential increase in the number of COVID-19 cases in the current pandemic with ~15% of infected patients requiring intensive care.² As many hospitals would be dealing with patients that are either severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positive, suspected, or under surveillance, a comprehensive protocol is imperative if they require surgical intervention.

We agree with the authors' stepwise recommendations about operating theatre preparation for anaesthesia, infection prevention, and control in patients with COVID-19 undergoing tracheostomy, effective workflow processes, staff training, and resource management. We appreciate that the authors have dealt with several patients requiring tracheostomy and reported one case as an example. However, we believe the report lacks some important information that will surely strengthen and improve processes and effective management of COVID-19 patients undergoing tracheostomy.

It would be interesting to know if the decision to perform tracheostomy was made when the patient was seronegative or seropositive for COVID-19. Also, it would be helpful to know if a repeat polymerase chain reaction (PCR) test, chest radiograph, or chest CT scan was performed to assess the progress of the disease. The British and Canadian guidelines recommend that elective procedures should be avoided in patients who are PCR positive for SARS-CoV-2 or have an active infection because of chances of spreading the infection.^{3,4} During the course of treatment, if the patient has become PCR negative, is there still a need for taking lengthy and elaborate precautions? However, if the patient was COVID-19 positive, what were the reasons to delay open tracheostomy until the 39th day? A recent study showed that mortality was 80% in COVID-19-positive patients who had survived beyond 28 days on mechanical ventilation with tracheal intubation.⁵ Tracheostomy is considered a high-risk procedure, and chances of transmission of SARS-CoV-2 to providers are high.^{3–5} An early tracheostomy is considered beneficial for pulmonary secretion clearance, reduced risk of subglottic stenosis, reduced sedation, and early weaning from mechanical ventilation.⁶

Although the authors mention that a huddle was performed, there was no mention of whether they followed the recommendations and had a dedicated responsible individual to liaise with other team members.⁷ Did the authors use or

recommend using a depth of anaesthesia monitor as mandated by the Royal College of Anaesthetists⁸?

Open tracheostomy is generally performed in a controlled environment, such as the operating theatre, where the air should be purified through high-efficiency particulate air filters and ultraviolet light, but whether was it in accordance with Food and Drug Administration recommendations⁹? Perhaps under the circumstances, it is worth considering performance of tracheostomy at the bedside as COVID-19-positive patients are nursed in a negative-pressure room, where the required equipment and surgeons and their assistants would perform the procedure by the bedside.⁷ This would minimise logistical and other problems related to the transfer of critically ill patients.

We hope our suggestions will compliment strengthening the workflow and preparation for anaesthesia, infection prevention, and control in COVID-19-positive patients undergoing tracheostomy.

Declarations of interest

The authors declare that they have no conflicts of interest.

References

1. Wong W-Y, Kong Y-C, See J-J, et al. Anaesthetic management of patients with COVID-19: infection prevention and control measures in the operating theatre. *Br J Anaesth* 2020; 125: e239–41
2. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; 395: 1054–62
3. COVID-19 tracheostomy guidelines. British Laryngological Association; April 2020. Available from: <https://www.britishlaryngological.org/sites/default/files/BLA%20Tracheostomy%20guideline%20-BLA%20April%202020%20FINAL.pdf>. Web April 30, 2020
4. Sommer DD, Engels PT, Usaf CEKW, et al. Recommendations from the CSO–HNS Taskforce on performance of tracheotomy during the COVID-19 pandemic. *J Otolaryngol Head Neck Surg* 2020; 49: 23
5. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med* 2020; 8: 475–81
6. Adly A, Youssef TA, El-Begermy MM, et al. Timing of tracheostomy in patients with prolonged endotracheal

- intubation: a systematic review. *Eur Arch Otorhinolaryngol* 2018; 275: 679–90
7. Chao TN, Braslow BM, Martin ND, et al. Tracheotomy in ventilated patients with COVID-19: guidelines from the COVID-19 tracheotomy task force, a working group of the airway safety committee of the university of Pennsylvania health system. *Ann Surg* May 5, 2020. <https://doi.org/10.1097/SLA.0000000000003956>. Advance Access published on
 8. Checketts MR, Alladi R, Ferguson K, et al. Recommendations for standards of monitoring during anaesthesia and recovery 2015: association of Anaesthetists of Great Britain and Ireland. *Anaesthesia* 2016; 71: 85–93
 9. *Guidance for industry and Food and Drug administration staff* 2020. Available from: <https://www.fda.gov/media/136533/download>. Web April 30, 2020

doi: 10.1016/j.bja.2020.05.007

Advance Access Publication Date: 16 May 2020

© 2020 British Journal of Anaesthesia. Published by Elsevier Ltd. All rights reserved.

COVID-19 and improved prevention of hospital-acquired infection

Ling-Qun Hu¹, Jin Wang², Anna Huang³, Danzhao Wang⁴ and Jingping Wang^{5,*}

¹Columbus, OH, USA, ²St Louis, MO, USA, ³New York, NY, USA, ⁴Decatur, GA, USA and ⁵Boston, MA, USA

*Corresponding author. E-mail: jwang23@mgh.harvard.edu

Keywords: COVID-19; hospital-acquired infection; influenza; masks; personal protective equipment; social distancing

Editor—The hospital-acquired infection rate is a hallmark metric for quality of care in US hospitals, where 7 million infections occurred while being treated for other ailments in 2018.¹ During the coronavirus disease 2019 (COVID-19) pandemic, clinicians have practiced prevention of nosocomial pneumonia vigilantly. Many hospitals in the USA implemented their own protective measures as a response to the ongoing COVID-19 pandemic even before the US Centers for Disease Control and Prevention (CDC) recommended voluntary mask wearing in the public. Even with these extra precautionary measures, healthcare workers have been disproportionately infected, with 9282 reported cases of COVID-19, resulting in 27 deaths, with 55% of respondents saying they contracted the virus while at work based on a report from the CDC on April 9, 2020.² Interventions to impede early spread of COVID-19 were not nearly effective enough and resulted in a fatality rate as high as 5.8% in some populations compared with the 0.5% fatality rate for seasonal flu in the USA, which is why new protocols and early prevention need to be implemented in the future.³

The current threat of COVID-19 not only affects healthcare workers on the frontline, but also increases exposure to their family members. According to the first 262 cases in Beijing, China, 50.8% of cases involved family clusters.⁴ Because of this, many healthcare providers opt to isolate themselves from their families after work, staying in their garage or basement, or renting a hotel room or apartment to avoid spreading the virus from the hospital setting. However, the consequences of these protective measures and physical distancing policies are detrimental to their mental health. In the last week of April 2020, there has been two documented cases of healthcare worker suicide, with an abundance of other mental health issues, including anxiety, depression, and post-traumatic stress disorder escalating as well.⁵

We are now entering a transition period of gradually reopening the economy across the world. In doing so, vital questions must be acknowledged: (i) Should the use of surgical masks for both healthcare providers and patients in all our medical facilities be required until a proper vaccine or treatment is developed? (ii) Should the current universal mask policy become the new normal? Both of these protocols may prove beneficial after the pandemic to prevent hospital-acquired respiratory infections, especially during the annual flu season.

Based on data from the European CDC³, there are distinct mortality curves between geographical areas. In contrast to Europe and North America that have been especially burdened by COVID-19 and only advocated for social distancing and handwashing, countries in Asia with visibly lower mortality and infection rates shared the common practice of protective masking and handwashing (Fig. 1). One explanation for the phenomenon could be that face masks prevent or slow rates of transmission especially in dense populations.

As a result of these initial findings, the CDC began advocating for face coverings in public on April 3, 2020, which was contradictory to the original guidelines to not wear masks because of shortages of personal protective equipment (PPE) for medical personnel. Mask wearing has now been mandated for use in public in many states. These mask wearing guidelines are especially important in highly dense populations, such as New York City, where there are high numbers of both confirmed COVID-19 cases and deaths. Practicing distancing for people living in this environment is nearly impossible, so implementation of stay-at-home orders is key to flattening the curve in such areas. Hospitals face a similar issue with social distancing and the limitations of physical space, such as inside elevators and clinical rooms, so additional guidelines to protect healthcare workers are necessary. To combat hospital-acquired infections, we