



## Editorial

## How to protect operating room staff from COVID-19?



## 1. Background

According to the world health organization (WHO), coronavirus is a member of a large family of viruses, common to humans and animals. It can be transmitted between animals and humans and cause diseases such as the common cold or more severe diseases such as the Middle East Respiratory Syndrome (MERS-CoV) and the Severe Acute Respiratory Syndrome (SARS-CoV).<sup>[1]</sup> It would be possible to see the spreading of the virus in the countries with a weaker health system and with not well prepared to deal with it.<sup>[2]</sup>

Health care systems may become overwhelmed with patient volume and face an increase in the number of hospitalizations and deaths. In addition, healthcare providers may become infected due to the high rate of the disease or inadequate protective equipment. As healthcare personnel are at the forefront of the care for the suspected or confirmed patients with Coronavirus 2019 (COVID-19), they are most exposed to the virus;<sup>[3]</sup> therefore, the protection of health care workers is of great importance.<sup>[4]</sup> So far, there has been no vaccine against COVID-19 and no specific medication has been approved for treatment against the virus, so supportive treatment and non-pharmacological interventions remain the most important response strategies for now.<sup>[5]</sup>

Preliminary reports suggest that the virus transmission is more likely to occur on a person-to-person basis when in close contact with a person infected with COVID-19. Person-to-person transmission may occur in a manner similar to other coronaviruses, mainly through respiratory droplets of an infected person coughing. These droplets can be inhaled into the mouth, or enter nose or eye mucosa of people who are close to infected people, or even inhaled into the lungs.<sup>[6]</sup> Maintaining the right personal distance (approximately 6 feet) is very important in preventing the spread of COVID-19. Also, one may receive COVID-19 by touching a surface or object with the virus on it and then touch their mouth, nose, or eyes. At present, the amount of contamination that is transmitted by touching objects and surfaces is unclear.<sup>[7]</sup> Adhering to Centers for Disease Control and Prevention (CDC) and the World Health Organization infection prevention and control guidelines, including the use of recommended personal protective equipment (PPE), can minimize the risk of exposure.<sup>[3]</sup> Elective surgical cases involving patients infected with the coronavirus should be postponed, but patients undergoing emergent surgery are still being cared for in the operating rooms. Operating room staff and the surgical team who are in direct contact with patients infected with the coronavirus are at risk for infection. Therefore, in this Editorial, we review standard precautionary measures for the operating room medical staff.

## 1.1. Protective strategies for personnel

## 1.1.1. Patient admission

It should be ensured that standard and COVID-19 precautions are utilized for all patients with unknown infection status. Place a facemask on these patients, especially during transport around the hospital or when in the presence of hospital staff and other patients. Such patients should be placed in a room with negative air pressure and the room air must be ventilated directly out of the hospital. Disposable supplies for each patient must be used, whenever possible.<sup>[8]</sup>

## 1.1.2. Hand hygiene

Healthcare providers should wash and rinse their hands completely for at least twenty seconds before and after contact with each patient.<sup>[8]</sup> It should be noted that handwashing should be done in each of the following steps, including: 1. before putting on personal protective equipment; 2. after removing personal protective equipment; 3. every time one changes their protective gloves; 4. after any contact with people suspected or unknown COVID-19 status, those confirmed as COVID-19 positive, and/or their biological residues; 5. after contact with respiratory secretions, before eating and after toilet use.<sup>[9]</sup>

## 1.1.3. Gloves

After washing your hands, clean gloves should be worn, and if the gloves are torn or contaminated, they should be removed and replaced. The staff should also take off the gloves and wash their hands after performing procedures.<sup>[8]</sup>

## 1.1.4. Gowns

Hospital staff should wear gowns when entering a room with a COVID-19 suspected or known positive patient. They should be replaced with new ones if they are worn or contaminated. Disposable gowns must be discarded after use and the reusable ones should be washed per protocol.<sup>[8]</sup>

## 1.1.5. Respiratory protection

The healthcare personnel should wear an appropriate mask before entering the room (e.g. N95) and these supplies should be discarded or recycled after leaving the room. It should be noted that in the case of wearing reusable protective equipment, they should be disinfected according to the manufacturer's instructions.<sup>[8]</sup> One could be exposed to blood and body fluids even if wearing an N95 mask, so eye protection such as a face shield should be used. There are other alternatives to N95 masks including other classes of respirators, elastomeric half-masks, and full-face respirators as well as powered air-purifying respirators (PAPRs). These devices are at least as effective as the N95 masks, and

may be a better option for those who cannot fit into the standard N95 masks. It should be noted that elastomeric half-masks and PARPs should be worn with caution during surgical procedures as not to endanger room sterility by the unfiltered exhalation. Elastomeric half-masks can be disinfected and reused. Each of the alternative respiratory equipment items can be considered at least as effective as the N95 mask, such as the N99, N100, P95, P99, P100, R95, R99, and R100 masks.<sup>[10]</sup>

#### 1.1.6. Eyes protection

Healthcare providers should wear eye protection (e.g. protective goggles or disposable face protectors that cover the front and sides of the face) when entering a room with a COVID-19 positive or suspected patient. Disposable eye protectors must be discarded after use and the reusable protective equipment should be disinfected according to the manufacturer's instructions.<sup>[8]</sup>

#### 1.1.7. Aerosol-generating precautions

Some procedures can cause aerosolization of air particles, such as bronchoscopies and upper endoscopies. These procedures can cause coughing. These procedures should be performed carefully to minimize aerosolization, and all personnel should use respiratory protective equipment. The number of personnel should be reduced to the minimum required level, and all surfaces in the procedure room should be thoroughly disinfected.<sup>[8]</sup>

#### 1.2. Biological waste disposal

All biological waste generated while caring for COVID-19 positive patients should be safely collected and disposed of in specified containers and bags. All persons responsible for this procedure should use personal protective equipment (such as boots, aprons, long sleeved gown, gloves, masks, and eye protection) and after disposing of waste, they must remove the equipment and wash their hands with special care.<sup>[9]</sup>

It is important to note that the use of personal protective equipment should be strictly followed based on institutional and national protocols, in order to decrease the likelihood of contamination. There are currently many cases of health care workers getting infected with respiratory viruses after patient care. This indicates the need to ensure compliance with hand hygiene and the use of PPE to prevent the virus from spreading to other areas of the hospital.<sup>[11]</sup> Standards regarding the use of PPE for infection control in hospitals is vital and compliance will affect the health of all facility staff.

In summary, it is important that health centers set up guidelines and policies and ensure that they are known and followed by all employees.

Also, continuous safety training programs are needed to promote an understanding of the importance of the use of PPE.

#### Declaration of competing interest

The authors declare no conflict of interest.

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