

# Coronavirus Disease-19 Pandemic: How to Flatten the Curve?

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## ABSTRACT

Coronavirus disease-19 (COVID-19) is an acute respiratory illness caused by a novel human coronavirus. The two main routes of transmission of the COVID-19 virus, described at present, are respiratory droplets and contact. Preventive and mitigation measures are key in breaking the chain. The most effective preventive measures include performing hand hygiene frequently or avoiding touching your face; practising respiratory hygiene; wearing a medical mask at all times if you have respiratory symptoms while going out and performing hand hygiene after disposing of the mask, and maintaining social distance (a minimum of 1 m) from persons with respiratory symptoms or even general population while outside. The COVID-19 pandemic caused by novel human corona virus has made knowledge regarding respiratory hygiene, respiratory protective equipment, and personal hygiene the need of the hour.

**Keywords:** Coronavirus, COVID-19, Hygiene.

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Coronavirus disease is an acute respiratory illness caused by a novel human coronavirus (SARS-CoV-2, called COVID-19 virus), which causes higher mortality in people aged  $\geq 60$  years and in people with underlying medical conditions such as cardiovascular disease, chronic respiratory disease, diabetes, and cancer. The COVID-19 outbreak was announced as a public health emergency of international concern on January 30, 2020. Initially, most cases were reported from China and among individuals with travel history to China but slowly it migrated to different parts of the world and within our country too.

Health workers are at risk of infection, as they are the front line of the COVID-19 outbreak response and are exposed to hazards. Hazards to frontline healthcare workers (HCWs) include long working hours, pathogen exposure, fatigue, psychological distress, stigma, occupational burnout, and physical and psychological violence.

The two main routes of transmission of the COVID-19 virus, described at present, are respiratory droplets and contact. Cough or sneeze of an infected person generates droplets that are infective, and any person who is in close contact (within 1 m) with someone who has positive symptoms (coughing and sneezing) is at risk of being exposed to potentially infective respiratory droplets. The virus remains viable on surface where the droplets of an infective person falls; thus, the immediate environment of an infected individual can serve as a potential source of transmission (contact transmission).<sup>1</sup>

SARS-CoV-2 belongs to the betaCoVs category. Electron microscopic appearance of coronaviruses is a crown-like appearance over a positive-stranded RNA virus. The name is derived from the latin term "*coronam*" meaning crown. They are of round, elliptic, or pleomorphic form with a diameter of approximately 60 to 14 nm, with spike-like glycoproteins on the envelope. They are sensitive to heat and UV rays and can be effectively inactivated by lipid solvents such as ether, ethanol (60–95%), and chlorine-containing disinfectants except chlorhexidine.<sup>2</sup>

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## INFECTION PREVENTION AND CONTROL STRATEGIES TO PREVENT OR LIMIT TRANSMISSION IN HEALTHCARE SETTINGS

Proper triaging, early recognition, and control of source of infection using screening and triaging at the entrance of the facility, posting signs in public areas, and encouraging HCWs for high level of suspicion forms the backbone of infection prevention and control strategies. Use of standard precautions for all patients irrespective of the disease status such as, ensuring all patients use protective masks, performing hand hygiene, implementation of additional precautions in suspected cases of COVID-19, which include use of adequately ventilated rooms, implementation of social distancing norms, use of personal protective gears, cleaning of equipments like thermometers, stethoscopes, or otoscopes that have to be shared among patients with with 70% ethyl alcohol, implementing administrative controls to maintain adequate patient staff ratio, use of surveillance process for staff, and providing adequate training helps in preventing and limiting transmission in healthcare settings.<sup>3</sup> Use of environmental and engineering controls by ensuring cleaning and disinfection of surfaces in stairs, door knobs,

lifts, etc. by hospital disinfectants such as sodium hypochlorite can be done as an added method to limit the spread of infection in HCWs.

Screening, triage, and early recognition of patients with the use of separate, well-ventilated waiting area for patients with respiratory symptoms, and emphasis on hand and respiratory hygiene should be followed in the outpatient setting.<sup>4</sup> Health care workers should use personal protective measures such as masks and gloves and maintain social distancing at all times. Any suspected or confirmed COVID-19 cases should be reported to relevant authorities as required by law or mandate.<sup>5</sup> Visitors with significant risk factors for COVID-19 such as close contact with a confirmed case and recent travel to an area with community transmission should be denied access to the healthcare facility.

All laboratory specimens collected should be regarded as potentially infectious and should adhere to standard bio-safety practices so as to minimize the possibility of exposure to pathogens. Healthcare workers, who collect the suspected sample, should use personal protective equipments (PPEs), and the HCWs who transport the sample should be trained in safe handling of the specimens and decontamination procedures. Labeled specimens are to be transported in leakproof container to the laboratory by hand whenever possible.

There is limited evidence that wearing a medical mask by healthy individuals in the households or among contacts of a sick patient<sup>6</sup> or among attendees of mass gatherings may be beneficial as a preventive measure.<sup>7</sup> However, the use of cotton mask in healthcare facilities by HCWs had an increased risk of infection compared to those who wore medical masks in a study conducted by MacIntyre et al.<sup>8</sup>

Symptomatic people visiting a healthcare setting should wear a medical mask while waiting in triage or other areas and during transportation within the healthcare facility. Healthcare workers should wear a medical mask when entering a room where patients with suspected or confirmed COVID-19 are admitted and use a particulate respirator, at least as protective as a US National Institute for Occupational Safety and Health-certified N95, European Union standard FFP2, or equivalent, when performing or working in settings where aerosol-generating procedures, such as tracheal intubation, manual ventilation before intubation, tracheostomy, noninvasive ventilation, bronchoscopy and cardiopulmonary resuscitation, are performed.<sup>9</sup>

**RECOMMENDATION FOR SURGEONS**

A significantly higher viral load is noted in the nasopharynx and oropharynx which may be the reason for the higher infection rates in head and neck surgeons, otolaryngologists, anesthetists, and ophthalmologists since the beginning of this pandemic.<sup>10</sup> Bag and mask ventilation, intubation, extubation, ryle's tube insertion, tracheostomy, noninvasive ventilation, bronchoscopy, endoscopies, and even routine ENT examination can make the HCWs prone to infection.

An article by Botti et al. gives information on performing a safe surgical tracheotomy in patients affected by COVID-19 (Table 1).<sup>11</sup>

**CONCLUSION**

Preventive and mitigation measures are key in breaking the chain. The most effective preventive measures in the community

**Table 1:** Information on performing a safe surgical tracheotomy in patients affected by COVID-19

<i>Recommendation</i>	<i>Continue standard ventilator weaning until extubation and thereby prolonging the procedure</i>
Indications	Prolonged tracheal intubation Weaning facilitation Tracheal tube frequently blocked with secretions
Staff	Two ENT surgeons (at least one expert surgeon) One expert anesthesiologist One scrub nurse One standby nursing staff member inside the operating room A nurse standing outside the intensive care unit
Before surgery	Wear protective clothing to avoid splash Keep all the necessary instruments ready inside the operating room (a tracheostomy set of instruments, at least two tracheal tubes bipolar cautery, a shadowless lamp)
During surgery	Paralyze the patient and establish adequate preoxygenation (100% for 3') and stop mechanical ventilation before tracheotomy Avoid electrocautery, limit the use of bipolar cautery Deflate the cuff of the tracheal tube Perform tracheotomy with cold knife Pull the endotracheal tube just above the tracheal incision, under direct vision Do not remove the tube from endotracheal tube from the larynx Insert the tracheal tube avoiding splash of secretions Control that the tracheal cannula is correctly inflated Give ventilation again only after the tracheostomy tube is correctly inflated Suture the tracheal cannula to the skin Remove the endotracheal tube
After the surgery	Careful removal of personal protective equipment under strict supervision

include performing hand hygiene frequently with soap and water or alcohol-based hand rub with at least 60% isopropyl alcohol or avoiding touching your face which can lead to transmission of virus to your respiratory tract; practising respiratory hygiene by covering your mouth and nose while coughing and sneezing; wearing a medical mask at all times if you have respiratory symptoms, while going out, and performing hand hygiene after disposing of the mask; and maintaining social distance (a minimum of 6 feet) from persons with respiratory symptoms or even general population while outside.

Additional precautions to be followed by HCWs to protect themselves and prevent transmission in the healthcare setting include the use of PPE appropriately which involves selecting proper PPE and being trained in how to put on, remove, and dispose it.<sup>12</sup>

The COVID-19 pandemic caused by novel human corona virus has made knowledge regarding respiratory hygiene, respiratory protective equipment, and personal hygiene the need of the hour.

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