GUIDE TO INFECTION CONTROL IN THE HOSPITAL


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**KEY ISSUE**

The 2019-nCoV emerged in Wuhan city, Hubei, China in December 2019. The name was changed to COVID-19 on 13 February 2020. A cluster of pneumonia cases related to a seafood market was investigated and found to be caused by a novel coronavirus not previously isolated in humans. The outbreak was reported officially to the World Health Organization (WHO) at the end of December 2019, following isolation of this virus from the affected patients. Soon, the genomic sequence of the virus was made available to scientists around the world. The virus causing COVID-19 was named SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) and was classified as belonging to lineage B of the genus _Betacoronavirus_ and was closely related to the known SARS-CoV. By 13 February 2020, the WHO reported a total of 46,997 confirmed cases from 25 countries -- China, Singapore, Japan, Republic of Korea, Australia, Malaysia, Viet Nam, Philippines, Cambodia, Thailand, India, Nepal, Sri Lanka, United States of America, Canada, Germany, France, Italy, United Kingdom, Russian Federation, Belgium, Finland, Spain, Sweden, United Arab Emirates, Egypt, International conveyance (Japan). Of those reported cases, there were a total of 813 deaths and 6,188 severe cases (17.7%). The virus was officially named COVID-19 at a high level WHO meeting.

**KNOWN FACTS**

- COVID-19 emerged in Wuhan city, Hubei Province, China in December 2019. Subsequently, there has been a drastic increase in the number of cases occurring in China and hundreds of cases in more than 20 countries outside of China. Severe cases were reported in about 17.7% of cases.
• The etiology of COVID-19 is SARS-CoV-2, a _Betacoronavirus_ closely related to the known SARS-CoV.
• The intermediate host has not been identified yet.
• The incubation period for the COVID-19 is thought to be 2-14 days.
• Recognition of the COVID-19 epidemic was important and the credit goes to Chinese scientists including the late ophthalmologist Li Wenliang, who was among eight physicians who alerted the world of an outbreak of pneumonia of unknown cause. In addition, the web-based international surveillance system for emerging pathogens -- ProMED-mail -- had reports of cases of undiagnosed pneumonia resembling SARS weeks before the World Health Organization (WHO) reported the epidemic.
• There is no clear data on the rate of infected healthcare workers, however, it was reported that more than 1,700 health workers were infected by SARS-CoV-2 and had COVID-19 in China and there were 6 deaths.

**Controversial Issues**
• The exact mode of transmission of the SARS-CoV-2 is not known; however, it is thought that the virus spreads primarily via large droplets and thus, close contact is a risk factor.
• However, it is possible that droplet nuclei transmission (airborne) may occur during aerosol generating procedures.
• It is not known if fecal transmission is possible for SARS-CoV-2, as it was reported with SARS.
• It is possible that environmental contamination plays a role in transmission.
• Currently, there is no approved therapy for the COVID-19.
• Routine cleaning and disinfection are suitable for cleaning in healthcare settings.
SUGGESTED PRACTICE

General Principles

It is important to realize and adhere to the routine practice of early identification, triaging suspected patients, and promptly isolating them. Personnel at country entry ports who are taking the temperature of arrivals may only need hand hygiene (alcohol-based handrub/ABHR) if more than 1 meter away behind a desk or partition. For those coming in contact with asymptomatic contacts, a surgical face mask is adequate. In healthcare facilities where there is no high-risk aerosol generating procedure involved, face mask, gloves, and aprons are recommended. N-95 respirators are recommended in situations where a high-risk aerosol generating procedure is undertaken such as in the ICU with suctioning, or intubation, and nebulization therapy. It is not clear whether taking a nasopharyngeal swab will require an N-95 respirator, but most said it should, due to the close proximity. It is important to keep in mind that the use of gloves does not substitute hand hygiene. Gowns and eye protection should be used as well as hair covers and shoe covers if available. It is preferable to place the patient in a room with negative air pressure, especially during aerosol generating procedures.

Table: Management of Suspected COVID-19 Patients

- Isolate the patient
- Place the patient in a private room with negative pressure, if possible.
- Wear gloves, a gown, a mask, and if performing an aerosol generating procedure, use an N-95 respirator.
- Just before leaving the room, remove the gown, mask, and gloves.
- Carry out hand hygiene ABHR or washing.
- Carefully remove the N-95 respirator outside the patient’s room, without contaminating hands.
• Perform hand hygiene after removing gloves, and as indicated, apply the WHO’s ‘My Five Moments for Hand Hygiene’.
• Limit the number of healthcare workers caring for the patient and track them.
• Limit the number of visitors.
• Perform diagnostic studies if possible, to rule out known causes of community-acquired pneumonia and to rule in COVID-19 disease (SARS-CoV-2 virus).
• Maintain a clean and dry environment with daily cleaning with soap and water and wiping over with 70% alcohol wipes of all surfaces in the healthcare zone.
• Use 70% alcohol on bedside counters and on medical equipment that can tolerate the disinfectant, such as IV poles, at least daily. Note that chlorine is corrosive and also an irritant for the respiratory tract, thus making clinical symptoms worse.
• Supplement oxygen for hypoxemia.
• Use antibacterial agents if secondary community-acquired pneumonia has been diagnosed.
• Use a neuraminidase inhibitor for the treatment of influenza.

Unprotected exposure of healthcare workers to non-isolated asymptomatic contacts or symptomatic patients puts the healthcare workers and other patients at risk. Thus, it is ideal if healthcare workers undergo self-quarantine for 10-14 days at home before returning to work. During this time daily temperature and clinical condition must be recorded. A nasopharyngeal swab should be taken to exclude carriage. This practice may be very important for limiting the transmission of COVID-19 causing virus, SARS-CoV-2, within the healthcare facility. In addition, family members should limit their contact at home with the suspected case during the 10-14 days of furlough. A member of the family should take responsibility to educate the others on hand hygiene and maintaining a 1 meter distance.
SUGGESTED PRACTICE IN UNDER-RESOUCECED SETTINGS

Table: Management of Suspected COVID-19 Patients

- Isolate the patient and ensure that at least minimum requirements for infection prevention and control are in place as soon as possible.
- Applying standard precautions for all patients.
- Place the patient in an adequately ventilated single room.
- Wear gloves, a gown, and regular surgical masks (N-95, especially when performing aerosol generating procedures).
- Just before leaving the room, remove the gown, mask, and gloves. Discard in an infectious waste container.
- Perform hand hygiene after removing gloves, and as indicated, apply the WHO’s ‘My Five Moments for Hand Hygiene’
- Limit the number of healthcare workers caring for the patient.
- Limit the number of visitors.
- Perform diagnostic studies if possible, to rule out known causes of community-acquired pneumonia and to rule in COVID-19 disease, SARS-CoV-2.
- Maintain a clean environment. Use 70% alcohol on bedside counters and on medical equipment that can tolerate the disinfectant, such as IV poles, at least daily. Note that chlorine is corrosive and also an irritant for the respiratory tract, thus making clinical symptoms worse.
- Supplement oxygen for hypoxemia.
- Use antibacterial agents if secondary community-acquired pneumonia has been diagnosed.
- Consider a neuraminidase inhibitor, if available, for treatment of influenza.
SUMMARY

The COVID-19 disease is a newly emerging infectious disease caused by a novel coronavirus, SARS-CoV-2. This virus is phylogenetically distinct from previously known human and animal coronaviruses but is closer to the SARS virus. The SARS-CoV-2 virus was first identified in Wuhan city, Hubei, China in December 2019 and caused a large global outbreak. It spreads from person to person by droplets and contact, direct or indirect (although close contact was necessary for transmission most of the time), and fomites. To contain this virus and other novel coronaviruses, there is no room for error or relaxation of the highest standards of all features of infection control.

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