

Infection prevention and control during health care when COVID-19 is suspected.

Interim guidance
19 March 2020



Background

This is the first edition of guidance on infection prevention and control (IPC) strategies for use when COVID-19 is suspected. It has been adapted from WHO's Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection,¹ based on current knowledge of the situation and experience with severe acute respiratory syndrome (SARS) and MERS.²

WHO will update these recommendations as new information becomes available.

This guidance is intended for health care workers (HCWs), health care managers, and IPC teams at the facility level but it is also relevant for national and district/provincial levels. Full guidelines are available from WHO.²

Principles of IPC strategies associated with health care for suspected COVID-19.

To achieve the highest level of effectiveness in the response to the COVID-19 outbreak using the strategies and practices recommended in this document, an IPC programme with a dedicated and trained team or at least an IPC focal point should be in place and supported by the national and facility senior management.³ In countries where IPC is limited or inexistent, it is critical to start by ensuring that at least minimum requirements for IPC are in place as soon as possible, both at the national and facility level, and to gradually progress to the full achievement of all requirements of the IPC core components according to local priorities.⁴

IPC strategies to prevent or limit transmission in health care settings include the following:

1. ensuring triage, early recognition, and source control (isolating patients with suspected COVID-19);
2. applying standard precautions for all patients;
3. implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of COVID-19;
4. implementing administrative controls;
5. using environmental and engineering controls.

1. Ensuring triage, early recognition, and source control.

Clinical triage includes a system for assessing all patients at admission, allowing for early recognition of possible COVID-19 and immediate isolation of patients with suspected disease in an area separate from other patients (source control). To facilitate the early identification of cases of suspected COVID-19, health care facilities should:

- encourage HCWs to have a high level of clinical suspicion;
- establish a well-equipped triage station at the entrance to the facility, supported by trained staff;
- institute the use of screening questionnaires according to the updated case definition. Please refer to the [Global Surveillance for human infection with coronavirus disease \(COVID-19\)](#) for case definitions, and
- post signs in public areas reminding symptomatic patients to alert HCWs.

Hand hygiene and respiratory hygiene are essential preventive measures.

2. Applying standard precautions for all patients

Standard precautions include hand and respiratory hygiene, the use of appropriate personal protective equipment (PPE) according to a risk assessment, injection safety practices, safe waste management, proper linens, environmental cleaning, and sterilization of patient-care equipment.

Ensure that the following respiratory hygiene measures are used:

- ensure that all patients cover their nose and mouth with a tissue or elbow when coughing or sneezing;
- offer a medical mask to patients with suspected COVID-19 while they are in waiting/public areas or in cohorting rooms;
- perform hand hygiene after contact with respiratory secretions.

HCWs should apply WHO's My 5 Moments for Hand Hygiene approach before touching a patient, before any clean or aseptic procedure is performed, after exposure to body fluid, after touching a patient, and after touching a patient's surroundings.⁵

- hand hygiene includes either cleansing hands with an alcohol-based hand rub or with soap and water;
- alcohol-based hand rubs are preferred if hands are not visibly soiled;

- wash hands with soap and water when they are visibly soiled.

The rational, correct, and consistent use of PPE also helps reduce the spread of pathogens. PPE effectiveness depends strongly on adequate and regular supplies, adequate staff training, appropriate hand hygiene, and appropriate human behaviour.^{2,5,6,7}

It is important to ensure that environmental cleaning and disinfection procedures are followed consistently and correctly. Thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital-level disinfectants (such as sodium hypochlorite) are effective and sufficient procedures.⁸ Medical devices and equipment, laundry, food service utensils, and medical waste should be managed in accordance with safe routine procedures.^{2,9}

3. Implementing empiric additional precautions

3.1 Contact and droplet precautions

- in addition to using standard precautions, all individuals, including family members, visitors and HCWs, should use contact and droplet precautions before entering the room of suspected or confirmed COVID-19 patients;
- patients should be placed in adequately ventilated single rooms. For general ward rooms with natural ventilation, adequate ventilation is considered to be 60 L/s per patient;¹⁰
- when single rooms are not available, patients suspected of having COVID-19 should be grouped together;
- all patients' beds should be placed at least 1 metre apart regardless of whether they are suspected to have COVID-19;
- where possible, a team of HCWs should be designated to care exclusively for suspected or confirmed cases to reduce the risk of transmission;
- HCWs should use a medical mask^a (for specifications, see reference 2);
- HCWs should wear eye protection (goggles) or facial protection (face shield) to avoid contamination of mucous membranes;
- HCWs should wear a clean, non-sterile, long-sleeved gown;
- HCWs should also use gloves;
- the use of boots, coverall, and apron is not required during routine care;
- after patient care, appropriate doffing and disposal of all PPE and hand hygiene should be carried out.^{5,6} A new set of PPE is needed when care is given to a different patient;
- equipment should be either single-use and disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect it between use for each individual patient (e.g. by using ethyl alcohol 70%);⁹

- HCWs should refrain from touching eyes, nose, or mouth with potentially contaminated gloved or bare hands;
- avoid moving and transporting patients out of their room or area unless medically necessary. Use designated portable X-ray equipment or other designated diagnostic equipment. If transport is required, use predetermined transport routes to minimize exposure for staff, other patients and visitors, and have the patient wear a medical mask;
- ensure that HCWs who are transporting patients perform hand hygiene and wear appropriate PPE as described in this section;
- notify the area receiving the patient of any necessary precautions as early as possible before the patient's arrival;
- routinely clean and disinfect surfaces with which the patient is in contact;
- limit the number of HCWs, family members, and visitors who are in contact with suspected or confirmed COVID-19 patients;
- maintain a record of all persons entering a patient's room, including all staff and visitors.

3.2 Airborne precautions for aerosol-generating procedures.

Some aerosol-generating procedures, such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy, have been associated with an increased risk of transmission of coronaviruses.^{12,13}

Ensure that HCWs performing aerosol-generating procedures:

- perform procedures in an adequately ventilated room – that is, natural ventilation with air flow of at least 160 L/s per patient or in negative-pressure rooms with at least 12 air changes per hour and controlled direction of air flow when using mechanical ventilation;¹⁰
- use a particulate respirator at least as protective as a US National Institute for Occupational Safety and Health (NIOSH)-certified N95, European Union (EU) standard FFP2, or equivalent.^{2,13} When HCWs put on a disposable particulate respirator, they must always perform the seal check.¹³ Note that facial hair (e.g. a beard) may prevent a proper respirator fit;¹³
- use eye protection (i.e. goggles or a face shield);
- wear a clean, non-sterile, long-sleeved gown and gloves. If gowns are not fluid-resistant, HCWs should use a waterproof apron for procedures expected to create high volumes of fluid that might penetrate the gown;²
- limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

^a Medical masks are surgical or procedure masks that are flat or pleated (some are like cups); they are affixed to the head with straps.²

4. Implementing administrative controls

Administrative controls² and policies for the prevention and control of transmission of COVID-19 within the health care setting include, but may not be limited to: establishing sustainable IPC infrastructures and activities; educating patients' caregivers; developing policies on the early recognition of acute respiratory infection potentially caused by COVID-19 virus; ensuring access to prompt laboratory testing for identification of the etiologic agent; preventing overcrowding, especially in emergency departments; providing dedicated waiting areas for symptomatic patients; appropriately isolating hospitalized patients; ensuring adequate supplies of PPE; and ensuring adherence to IPC policies and procedures for all aspects of health care.

4.1 Administrative measures related to health care workers.

- provision of adequate training for HCWs;
- ensuring an adequate patient-to-staff ratio;
- establishing a surveillance process for acute respiratory infections potentially caused by COVID-19 virus among HCWs;
- ensuring that HCWs and the public understand the importance of promptly seeking medical care;
- monitoring HCW compliance with standard precautions and providing mechanisms for improvement as needed.

5. Using environmental and engineering controls

These controls address the basic infrastructure of the health care facility¹⁴ and aim to ensure adequate ventilation¹⁰ in all areas in the health care facility, as well as adequate environmental cleaning.

Additionally, separation of at least 1 metre should be maintained between all patients. Both spatial separation and adequate ventilation can help reduce the spread of many pathogens in the health care setting.¹⁵

Ensure that cleaning and disinfection procedures are followed consistently and correctly.⁹ Cleaning environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is effective and sufficient.⁸ Manage laundry, food service utensils and medical waste in accordance with safe routine procedures.

Duration of contact and droplet precautions for patients with COVID-19.

Standard precautions should be applied at all times. Additional contact and droplet precautions should continue until the patient is asymptomatic. More comprehensive information about the mode of virus transmission is required to define the duration of additional precautions.

Collecting and handling laboratory specimens from patients with suspected COVID-19.

All specimens collected for laboratory investigations should be regarded as potentially infectious. HCWs who collect, handle, or transport clinical specimens should adhere rigorously to the following standard precaution measures and biosafety practices to minimize the possibility of exposure to pathogens.^{16,17,18}

- ensure that HCWs who collect specimens use appropriate PPE (i.e. eye protection, a medical mask, a long-sleeved gown, and gloves). If the specimen is collected during an aerosol-generating procedure, personnel should wear a particulate respirator at least as protective as a NIOSH-certified N95, an EU standard FFP2, or the equivalent;
- ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures;⁸
- place specimens for transport in leak-proof specimen bags (secondary containers) that have a separate sealable pocket for the specimen (a plastic biohazard specimen bag), with the patient's label on the specimen container (the primary container), and a clearly written laboratory request form;
- ensure that laboratories in health care facilities adhere to appropriate biosafety practices and transport requirements, according to the type of organism being handled;
- deliver all specimens by hand whenever possible. DO NOT use pneumatic-tube systems to transport specimens;
- document clearly each patient's full name, date of birth and "suspected COVID-19" on the laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported.

Recommendation for outpatient care

The basic principles of IPC and standard precautions should be applied in all health care facilities, including outpatient care and primary care. For COVID-19, the following measures should be adopted:

- triage and early recognition;
- emphasis on hand hygiene, respiratory hygiene, and medical masks to be used by patients with respiratory symptoms;
- appropriate use of contact and droplet precautions for all suspected cases;
- prioritization of care of symptomatic patients;
- when symptomatic patients are required to wait, ensure they have a separate waiting area;
- educate patients and families about the early recognition of symptoms, basic precautions to be used, and which health care facility they should go to.

References

- World Health Organization. [Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus \(MERS-CoV\) infection](#): interim guidance (accessed 17 January 2020).
- World Health Organization. [Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care](#). (accessed 17 January 2020).
- World Health Organization. [Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level](#). Geneva: World Health Organization; 2016 (accessed 20 January 2020).
- Minimum requirements for infection prevention and control. Geneva: World Health Organization; 2019 (<https://www.who.int/infection-prevention/publications/min-req-IPC-manual/en/>, accessed 20 January 2020).
- WHO guidelines on hand hygiene in health care: first global patient safety challenge – clean care is safer care. Geneva: World Health Organization; 2009 (<https://apps.who.int/iris/handle/10665/44102>, accessed 17 January 2020).
- How to put on and take off personal protective equipment (PPE). Geneva: World Health Organization; 2008 (<http://www.who.int/csr/resources/publications/putontakeoffPPE/en/>, accessed 17 January 2020).
- Rational use of PPE
- CDC and ICAN. Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. Atlanta, GA: US Department of Health and Human Services, CDC; Cape Town, South Africa: Infection Control Africa Network; 2019. (<https://www.cdc.gov/hai/prevent/resource-limited/environmental-cleaning.html> and <http://www.icanetwork.co.za/icanguideline2019/>, accessed 20 January 2020).
- Decontamination and Reprocessing of Medical Devices for Health-care Facilities. Geneva: World Health Organization; 2016 (<https://www.who.int/infection-prevention/publications/decontamination/en/>, accessed 20 January 2020).
- Atkinson J, Chartier Y, Pessoa-Silva CK, Jensen P, Li Y, Seto WH, editors. Natural ventilation for infection control in health-care settings. Geneva: World Health Organization; 2009 (<https://apps.who.int/iris/handle/10665/44167>, accessed 17 January 2020).
- Hui DS. Epidemic and emerging coronaviruses (severe acute respiratory syndrome and Middle East respiratory syndrome). *Clin Chest Med*. 2017;38:71–86. doi:10.1016/j.ccm.2016.11.007.
- Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. *PLoS One*. 2012;7:e35797. doi: 10.1371/journal.pone.0035797. Epub 2012 Apr 26.
- How to perform a particulate respirator seal check. Geneva: World Health Organization; 2008. (<http://www.who.int/csr/resources/publications/respiratorsealcheck/en/>, accessed 17 January 2020). For the latest information, please consult the WHO coronavirus webpage (http://www.who.int/csr/disease/coronavirus_infections/en/).
- Adams J, Bartram J, Chartier Y, editors. Essential environmental health standards in health care. Geneva: World Health Organization; 2008 (<https://apps.who.int/iris/handle/10665/43767>, accessed 17 January 2020).
- Jefferson T, Del Mar CB, Dooley L, Ferroni E, Al-Ansary LA, Bawazeer GA et al. Physical interventions to interrupt or reduce the spread of respiratory viruses. *Cochrane Database Syst. Rev*. 2011, 7:CD006207. (<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006207.pub4/abstract;jsessionid=074644E776469A4CFB54F28D01B82835.d03t02>. Accessed 17 January 2020).
- Laboratory testing for 2019 novel coronavirus (2019-nCoV) in suspected human cases: interim guidance January 2020. Geneva: World Health Organization. (<https://apps.who.int/iris/bitstream/handle/10665/33067/6/9789240000971-eng.pdf>).
- Laboratory testing for Middle East respiratory syndrome coronavirus: interim guidance (revised), January 2018. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/bitstream/handle/10665/25995/2/WHO-MERS-LAB-15.1-Rev1-2018-eng.pdf?sequence=1>, accessed 17 January 2020).
- Laboratory biosafety manual, third edition. Geneva: World Health Organization; 2004 (<https://apps.who.int/iris/handle/10665/42981>, accessed 17 January 2020).

Acknowledgements

The original version of the MERS-CoV IPC guidance¹ was developed in consultation with WHO's Global Infection Prevention and Control Network and Emerging Diseases Clinical Assessment and Response Network, and other international experts. WHO thanks those who were involved in developing and updating the IPC documents.

This document was developed in consultation with the WHO Global Infection Prevention and Control Network and other international experts. WHO thanks the following for their review (in alphabetical order):

- Abdullah M Assiri, Director General, Infection Control, Ministry of Health, Saudi Arabia.
- Michael Bell, Deputy Director of Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, USA.
- Gail Carson, ISARIC Global Support Centre, Director of Network Development, Consultant in Infectious Diseases and Honorary Consultant Public Health England, United Kingdom.

- John M Conly, Department of Medicine, Microbiology, Immunology and Infectious Diseases, Calvin, Phoebe and Joan Snyder Institute for Chronic Diseases, Faculty of Medicine, University of Calgary, Calgary, Canada.
- Barry Cookson, Division of Infection and Immunity, University College, London, United Kingdom.
- Babacar N Doye, Board Member, Infection Control Network, Dakar, Senegal.
- Kathleen Dunn, Manager, Healthcare Associated Infections and Infection Prevention and Control Section, Centre for Communicable Disease Prevention and Control, Public Health Agency of Canada.
- Dale Fisher, Global Outbreak Alert and Response Network steering committee.
- Fernanda Lessa, Epidemiologist, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, USA.
- Moi Lin Ling, Director, Infection Control Department, Singapore General Hospital, Singapore and President of Asia Pacific Society of Infection Control (APSIC).
- Fernando Otaiza O’Rayan, Head, National IPC Program, Ministry of Health, Santiago, Chile
- Diamantis Plachouras, Unit of Surveillance and Response Support, European Centre for Disease Prevention and Control.
- Wing Hong Seto, Department of Community Medicine, School of Public Health, University of Hong Kong, Hong Kong, People’s Republic of China.
- Nandini Shetty, Consultant Microbiologist, Reference Microbiology Services, Colindale, Health Protection Agency, United Kingdom.

From WHO we also thank:

Benedetta Allegranzi, April Baller, Ana Paula Coutinho, Janet Diaz, Christine Francis, Maria Clara Padoveze, Joao Paulo de Toledo, Maria Van Kerkhove.

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

© **World Health Organization 2020**. Some rights reserved. This work is available under the [CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/) licence.