

COVID-19 and infection prevention and control in health facilities

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Introduction

Infection prevention and control (IPC) is a scientific approach and practical solution designed to prevent harm caused by infection to patients and health workers. According to the World Health Organization (WHO), IPC is vital for patient safety and quality universal health coverage since it is relevant to health workers and patients at every single health-care encounter.^[1] Implementing a robust IPC plan in health facilities during the COVID-19 pandemic will go a long way in breaking the chain of infection and spread of the coronavirus. By protecting the health workers from getting sick from infected patients and to preventing the spread the virus from health workers to the public. Every health worker in the facility must be trained in IPC.

The guidance in this article was mainly drawn from an IPC manual developed by Jhpiego and outlines the practices to which all health facilities should aspire.^[2] Readers should consult full reference manuals and guidelines for deeper understanding of the subject.^[1,3]

In order to implement effective IPC standards, the health facility should identify a focal person tasked with the responsibility to implement IPC. Strategies that can be used to prevent or limit transmission in health facilities are:

- Ensuring triage, early recognition, and source control (isolating patients with suspected COVID-19)
- Applying standard precautions for all patients,
- Implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of COVID-19,
- Issuing new guidance, policies and protocols for IPC as appropriate,
- Using environmental and engineering controls (e.g., reorganizing health facilities to create isolation rooms, improving airflow in existing rooms).

IPC standard precaution

The standard precautions are a set of activities in the health facility designed to prevent the transmission of infectious disease that are acquired by contact with blood, body fluids, non-intact skin (including rashes) and mucous membranes.^[3] All health workers use these standards when providing care to all patients, regardless of the appearance of disease or are asymptomatic.

The standard precautions are:

- Hand hygiene,
- Use of personal protective equipment (PPE),
- Needlestick and sharps injury prevention,
- Cleaning and disinfection,
- Respiratory hygiene,
- Waste disposal,
- Safe injection practices.

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In applying standard precautions for all patients, include the following:

- Ensure that all patients cover their nose and mouth with a tissue or elbow when coughing or sneezing.
- Offer a medical mask if available to patients with suspected COVID-19 while they are in waiting/public areas.
- Perform hand hygiene after contact with respiratory secretions and surfaces (e.g. door handles) that may have been contaminated by infected persons.

Hand hygiene

Hand hygiene is the single most important measure to prevent transmission of infection. The goal of hand cleansing is to remove any infected matter by reducing both transient and resident flora. Hand washing can either be done by water and soap or using an alcohol-based hand rub (hand sanitizer) containing at least 60% alcohol. Handwashing should be for at least 20 seconds.

The WHO's "Your 5 Moments for Hand Hygiene", (Figure 1) include washing hands in the following settings:

- Before touching a patient.
- Before performing a clean/aseptic task, including touching invasive devices.
- After performing a task involving the risk of exposure to a body fluid, including touching invasive devices.
- After patient contact.
- After touching equipment in the patient's surrounding areas.

Hand hygiene with soap and water

Handwashing with soap and water is recommended in the following situations: if hands are visibly soiled or contaminated with blood or body fluids; after using the toilet; before eating; and to remove the build-up of emollients (e.g., glycerol) on hands after repeated use of a hand rub.

Hand hygiene with an alcohol-based hand rub

The hand rub should have at least 60 – 80% alcohol content and an emollient like glycerol. Hand rub does not remove soil or organic matter if hands are visibly soiled or contaminated with blood or body fluids so use soap and water instead.

Use of Personal Protection Equipment (PPE)

The purpose of PPE is to protect health workers from serious infectious (e.g. coronavirus) and non-infectious



Figure 1. Your 5 Moments for Hand Hygiene. Source: [WHO](#)

hazards in the healthcare environment. The most common PPE used in health facilities include gloves (examination, sterile, and utility), head cover (cap, hood), mask/respirators, protective eyewear (face shields, goggles or safety glasses), gowns, aprons, closed-toe shoes and shoe covers. Figure 2.

Gloves

Gloves should be the right sizes for the health worker and sterile or non-sterile gloves put on following standard steps. Wearing gloves is not a substitute for hand hygiene. Gloves MUST be changed after contact with contaminated items and between patients. Reprocessing and reusing of gloves, except for heavy-duty utility gloves, should not be done.

Do's and don'ts about glove use:

- Do wear the correct size gloves, particularly surgical gloves,
- Do change sterile surgical gloves every 90-150 minutes during long procedures,
- Do change gloves when a perforation or defect is noticed or when there is a suspected perforation,
- Do keep natural fingernails short to reduce the risk of tears,
- Do pull gloves up over the cuffs of the gown (if worn) to protect the wrists,
- Do not use oil-based or perfumed hand lotions or creams,
- Do not store gloves in areas where there are extreme changes in temperatures.

Gowns

Gowns should fully cover the torso, fit comfortably over the body, and have long sleeves that fit snugly at the wrists. Isolation gowns are designed to prevent contamination of the arms, exposed areas of the body, and clothing from blood and body fluids and other potentially infectious material. Surgical gowns are sterile and preferably fluid-resistant, with sleeves that either taper gently toward the wrists or end with elastic or ties around the wrists. When the surgical gowns are put on, the cuffs of sterile surgical gloves should completely cover the end of the sleeves of the gowns.

Masks

The primary purpose of using masks is to protect health care workers from exposure to infectious materials from patients. Masks are of two types: surgical masks (should be fluid resistant) and procedure/isolation masks (have no specification and are not regulated). Face shields are better for protection against splashes of blood and body fluids. N95 respirators are used to protect from droplets and airborne infectious particles.

Respirators

Respirators are specialized masks, used to prevent inhalation of small particles that may contain infectious agents transmitted via the airborne route. Respirators contain multiple layers of filter material and fit the face tightly. N95 designation means that when subjected to careful testing, the respirator blocks at least 95% of very small (0.3 micron) test particles. They are more difficult to breathe through and more expensive than surgical masks. Every health worker should perform a fit test and seal test when using respirators.

Protective eyewear

The types of protective eyewear are: goggles, safety glasses, masks with attached shield and face shield. Eye protection is required when the mucous membranes of the eyes are susceptible portals of entry for infectious agents. Infection can be transmitted via splashes of blood or other body fluids, especially respiratory secretions emitted during specimen collection, suctioning, or intubation.

Head covering/caps

Head covers are most commonly used as part of surgical attire in surgical and procedure areas. Head covers or caps should be large enough to cover the entire scalp and hair to keep the hair, beard, and scalp covered so that flakes of skin and hair are not shed into the sterile field. During outbreaks like COVID-19, head covers are part of the routine PPE for contact, droplet or airborne precautions.

Footwear

Proper footwear decreases the risk of exposure to blood or other potentially infectious materials, sharps injuries, and

slipping or falling. All footwear should have closed toes, low heels, and non-skid soles. Rubber boots or leather shoes provide the best protection. They must be kept clean. Open-toe slippers and flip flops are not appropriate footwear in health care settings. Clean, sturdy shoes are recommended for all clinical areas.

Respiratory hygiene

During the COVID-19 outbreak, measures to avoid spread of respiratory secretions should be promoted to help prevent transmission in the health facility. Elements of respiratory hygiene and cough etiquette include: ^[2, 3]

- Covering the nose/mouth with a tissue when coughing or sneezing or using the crook of the elbow,
- Using tissues to contain respiratory secretions and discarding them immediately,
- Performing hand hygiene immediately after contact with respiratory secretions and contaminated objects/materials,
- Asking patients with signs and symptoms of COVID-19 to wear a mask when they come into the health facility,
- Spacing seating in waiting areas at least 2 metres apart to minimize close contact among persons in those areas,
- Supplies such as tissues, wastebaskets, alcohol gel, and masks should be provided in waiting and other common areas,
- Place cough etiquette signs where the public can see them.

Environmental cleaning and disinfection

According to the most recent correspondence published on aerosol and surface stability of SARS CoV-2 as compared with SARS-CoV-1 ^[4], COVID-19 survives for:

- 3 hours in aerosols,
- 72 hours on plastic,
- 48 hours on stainless steel,
- 4 hours on copper surfaces,
- 24 hours on cardboard.

Cleaning and disinfection are essential for keeping all surfaces and equipment safe for patients, providers, and visitors. Cleaning regularly touched surfaces reduces the chance of infection from contaminated surface. Use appropriate cleaning agents for cleaning environmental surfaces. Considerations for choosing a cleaning product and recommended disinfectants depend on intended use, efficacy, acceptability, safety, cost and availability, and volume.

Waste management

The goal here is to identify the categories and sources of waste associated with COVID-19 at the health facility and apply best practices for minimizing, segregating, collecting, transporting, and storing the health facility wastes. Health workers should use the appropriate PPE for waste collection. No equipment used for holding and transporting waste should be used for any other purpose. Use equipment that is easy to load and unload, does not have sharp edges, is easy to clean and is clearly labelled. Waste should be transported to final treatment and disposal area regularly to avoid pile up of large quantities. Waste containers and trolleys should be cleaned and disinfected after use.

Conclusions

The COVID-19 pandemic calls for a robust implementation of IPC in health facilities to break the transmission of the coronavirus. All health facilities should ensure that at least the minimum requirements for IPC are in place as soon as possible. Health facilities should also apply the standard precautions for all patients by the use of hand hygiene, proper use of PPE and educating patients and families about early recognition of symptoms and basic precautions. Inadequate IPC measures may lead to transmission of COVID-19 to patients, staff and visitors, and within the community.

References

1. World Health Organization, [Infection prevention and control](#), WHO 2020
2. Curless MS, Ruparelia CS, Thompson E, Trexler PA. Infection Prevention and Control: Reference Manual for Health Care Facilities with Limited Resources, 2018, Jhpiego Corporation.
3. Centers for Disease Control and Prevention. [Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in Healthcare Settings](#), CDC, 2020
4. van Doremalen N et al, [Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1](#) – correspondence. NEJM, 2020, DOI: 10.1056/NEJMc2004973

Additional materials

- [Covid-19: PHE upgrades PPE advice for all patient contacts with risk of infection](#) BMJ 2020;369:m1391 doi: 10.1136/bmj.m1391 (Published 3 April 2020)
- [WHO Use of masks.](#)