**Principles for Infection Prevention and control-COVID 19 Patients**

- Ensure triage, early recognitions and source control
- Apply Standard precautions for all the patients
- Implement additional precautions
- Implement administrative control

**Use environment & engineering control**

**Ensure triage, early recognition, and source control**

- Triage: 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.
- Patients suspected of having 2019-nCoV infection should be shifted to the isolation facility from the triage area as soon as possible. The HCWs should do this after donning appropriate PPE. The patients should wear mask/respirator.

---

Figure 1-Triage- adopted from WHO -The COVID-19-Risk management Package for Healthcare facilities

---

1 Infection Prevention & Control Guidelines for 2019-nCoV (COVID-19),AIIMS

*As per Available information till-30/3/2020*
### Equipment required for triage

1. Screening Questionnaire and algorithm: We should ensure patients are screened using this questionnaire. (See box below)

<table>
<thead>
<tr>
<th><strong>Fever:</strong></th>
<th>Have you experienced a new onset of fever &gt;38 degree Celsius in the past 14 days.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cough:</strong></td>
<td>Have you had a new onset of cough or shortness of breath in the past 14 days?</td>
</tr>
<tr>
<td><strong>Travel and Contact:</strong></td>
<td>Have you had travel to a country/place of high transmission of COVID-19 or have you had contact with someone experiencing respiratory symptoms in the past 14 days.</td>
</tr>
</tbody>
</table>

Based on the patient’s response, HCWs can identify the suspected cases\(^2\) of COVID-19 (See box below)

**Suspect Case:** A patient with acute respiratory illness {fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath)}, AND a history of travel to or residence in a country/area or territory reporting local transmission (See NCDC website for updated list) of COVID-19 disease during the 14 days prior to symptom onset;

OR

A patient/Health care worker with any acute respiratory illness AND having been in contact with a confirmed COVID-19 case in the last 14 days prior to onset of symptoms;

OR

A patient with severe acute respiratory infection {fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness breath)} AND requiring hospitalization AND with no other ethology that fully explains the clinical presentation;

OR A case for whom testing for COVID-19 is inconclusive.

**Laboratory Confirmed case:** A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

---

\(^2\) Updated case definition by NCDC

*As per Available information till-30/3/2020*
For Patients:-

- Wash your hands
- Practice social distancing from others
- Wear a mask if symptomatic

For Health facilities:-

- Separate in a single room
- Until a single room is found, separate by minimum 1 meter distance and offer patient a mask.

2. Infrared thermometer
3. Documentation Paper
4. PPEs
5. Hand Hygiene equipment and Poster
6. Waste Bins & access to cleaning & disinfection
7. Post signage in public areas with symptomatic screening questions to instruct patients to alert HCWs.

Set-up of area during triage

- 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
- Ensure adequate space for triage (maintain at least 1 meter between staff screening & patient/staff entering) to limit close contact between triage staff and potentially infectious patient. Physical barriers (e.g., glass or plastic screens) at reception areas may also be considered.
- Provision of hand washing facility (if not, alcohol-based hand rub) and masks (Also medical gloves and gowns to be kept and used based on risk assessments.
- Waiting room chairs for patient should be kept 1 meter apart.
- Maintain one way flow of patients and the staff.
- Family members of patients should wait outside the triage area to avoid overcrowding.

As per Available information till-30/3/2020
Standard Precautions for HCWs

Health-care workers caring for PUI (Patient under investigation) should follow Standard precautions:-

- Hand Hygiene
- Rational use of appropriate personal protective equipment (PPE)
- Respiratory hygiene and Cough etiquette
- Injection safety practices
- Safe handling of patient care equipment
- Environment cleaning
- Safe handling and cleaning of soiled linen
- Waste management

Hand Hygiene

HCWs should wash hands frequently with soap and water for 40-60 Seconds.

An alcohol based hand rub with 60-95% alcohol may be used for 20-30 Seconds.

If hands are visibly soiled, do not use alcohol based hand rub, but wash hands with soap and water.

Ensure WHO’s My 5 Moment for Hand Hygiene-

i. Before touching a patient
ii. Before any clean or aseptic procedure
iii. After exposure to body fluid
iv. After touching a patient
v. After touching a patient’s surroundings.

As per Available information till-30/3/2020
# How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

**Duration of the entire procedure:** 40-60 seconds

1. Wet hands with water;
2. Apply enough soap to cover all hand surfaces;
3. Rub hands palm to palm;
4. Right palm over left dorsum with interlaced fingers and vice versa;
5. Palm to palm with fingers interlaced;
6. Backs of fingers to opposing palms with fingers interlocked;
7. Rotational rubbing of left thumb clasped in right palm and vice versa;
8. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
9. Dry hands thoroughly with a single use towel;
10. Use towel to turn off faucet;
11. Your hands are now safe.

---

**As per Available information till-30/3/2020**
How to hand rub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS ONLY WHEN VISIBLY SOILED!

Duration of the entire procedure: 20-30 sec.

1. Apply a palmful of the product in a cupped hand, covering all surfaces.
2. Rub hands palm to palm,
3. Right palm over left dorsal with interlaced fingers and vice versa,
4. Palm to palm with fingers interlaced,
5. Backs of fingers to opposing palms with fingers interlocked,
6. Rotational rubbing of left thumb clasped in right palm and vice versa,
7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.
8. Once dry, your hands are safe.

Figure 4-WHO-How to Hand rub

As per Available information till-30/3/2020
Personal Protective Equipment

Personal Protective Equipment (PPEs) are protective gears designed to safeguard the health of workers by minimizing the exposure to a biological agent. Components of PPE are goggles for eye protection, face mask, gloves, coverall/gowns (with or without aprons), head cover and shoe cover. Each component and rationale for its use is given in the guidelines on rational use of Personal Protective Equipment for COVID-19 by the Ministry of Health and Family Welfare. Some guiding principle for usage is mentioned below:

- PPE should be used based on the risk of exposure and the extent of contact anticipated with blood, body fluids, respiratory droplets, and or open skin
- Perform hand hygiene according to the WHO "5 Moments"
- Select PPE items to wear based on the assessment.

*If performing an aerosol generating procedure, such as intubation, use a Particulate respirator such as an N95 – do a seal check!*

**Remember:-**

- Ideally, every area should have dedicated HR to avoid cross movement from one area to other area. This will also help in reducing any cross-transmission within the hospital
- Personal protective equipment should be changed between shift change and moving from general ward/place to Covid suspect ward.
- If utilizing single-use personal protective equipment (e.g. single-use masks, gloves, and face shields) dispose in a waste bin with a lid and wash your hands thoroughly. Anything single-use cannot be reused or sterilized!
- Don’t touch your eyes, nose or mouth with gloves or bare hands until proper hand hygiene has been performed

---


*As per Available information till-30/3/2020*
SEQUENCE FOR PUTTING ON
PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN
   - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
   - Fasten in back of neck and waist

2. MASK OR RESPIRATOR
   - Secure ties or elastic bands at middle of head and neck
   - Fit flexible band to nose bridge
   - Fit snug to face and below chin
   - Fit-check respirator

3. GOGGLES OR FACE SHIELD
   - Place over face and eyes and adjust to fit

4. GLOVES
   - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF
AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

**Figure 5-Sequence for Putting on PPE-CDC**

As per Available information till-30/3/2020
HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)

EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES
   - Outside of gloves are contaminated!
   - If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
   - Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
   - Hold removed glove in gloved hand
   - Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
   - Discard gloves in a waste container

2. GOGGLES OR FACE SHIELD
   - Outside of goggles or face shield are contaminated!
   - If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
   - Remove goggles or face shield from the back by lifting head band or ear pieces
   - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

3. GOWN
   - Gown front and sleeves are contaminated!
   - If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
   - Unfasten gown ties, taking care that sleeves don’t contact your body when reaching for ties
   - Pull gown away from neck and shoulders, touching inside of gown only
   - Turn gown inside out
   - Fold or roll into a bundle and discard in a waste container

4. MASK OR RESPIRATOR
   - Front of mask/respirator is contaminated — DO NOT TOUCH!
   - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
   - Grasp bottom ties or elastic of the mask/respirator, then the ones at the top, and remove without touching the front
   - Discard in a waste container

5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

Figure 6- How to remove PPEs-CDC

As per Available information till-30/3/2020
Respiratory Hygiene and Cough Etiquette

- Ensure that a medical mask to patients/visitors with suspected infection
- Provide clear instructions to all patients, attendants and staff to wear medical mask/or cover their nose and mouth with a tissue or follow etiquettes for coughing or sneezing. (If a tissue is used, it should be discarded in yellow bin after single use).
- Patient with fever, cough/sneezing should be kept 1 Meter apart
- Post visual aids like posters to remind patients, attendants and staff about the respiratory hygiene and cough etiquettes.
- Consider having masks & tissues available for patients in all areas of the hospital.
- Perform hand hygiene after contact with respiratory secretion

Injection Safety Practices

Seven steps of safe injection practices in health facilities are:-

1. Clean workspace
2. Hand hygiene
3. Sterile safely-engineered syringes
4. Sterile vial of medication and diluent
5. Skin cleaning & antisepsis
6. Appropriate collection of sharps
7. Appropriate waste management

Remember:-

- Use a new injection device for each procedure
- Inspect the packaging of the injection device to ensure that the protective barrier has not been breached
- Whenever possible, use a single-dose vial for each patient
- Open only one vial of a particular medication at a time
- Before use, examine the vial turbidity, particulate matter or discolouration, and discard if present

Safe handling of Patient Care equipment

- Equipment should be either single-use/ disposable or dedicated equipment (e.g. stethoscope, blood pressure cuffs and thermometer).
- If equipment needs to be shared among patients, clean and disinfect it between uses for each individual patient by using ethyl alcohol 70%.  

Principle of Asepsis and Environmental Infection Control

- Ensure the environment cleaning and disinfection procedures are followed consistently and correctly.

---

5 Infection prevention and control during health care when COVID-19 is suspected: interim guidance-WHO
6 Infection Prevention & Control Guidelines for 2019-nCoV (COVID-19), AIIMS

As per Available information till 30/3/2020
Through cleaning of environment surface with water and detergent and apply commonly used hospital level disinfectant (such as 1% sodium hypochlorite) at least thrice a day.

Leave the solution for a contact time of at least 10 minutes.

High touch surfaces like door handles, railing, and tabletops should be disinfected every 3-4 hours.

Low touch surfaces like walls, mirrors should be cleaned at least once daily.

Alcohol (e.g. isopropyl 70% or ethyl alcohol 70%) can be used to wipe down surfaces where the use of bleach is not suitable, e.g. metals.

**Safe handling and cleaning of soiled linen**

All individuals dealing with soiled bedding, towels and clothes from patients with COVID-19 infection should wear appropriate PPE before touching it, including heavy duty gloves, a mask, eye protection (goggles or a face shield), a long-sleeved gown, an apron if the gown is not fluid resistant, and boots or closed shoes.

They should perform hand hygiene after exposure to blood or body fluids and after removing PPE.

Soiled linen should be placed in clearly labelled, leak-proof bags or containers, after carefully removing any solid excrement and putting it in a covered bucket to be disposed of in a toilet or latrine.

The Infected linen (Soiled/Non soiled) is disinfected in 0.5% Hypochlorite solution for 30 min, and then thoroughly rinse the linen with plain water to remove the disinfectant. The linen is then handed over for washing.

**Machine washing**; with warm water at 60–90°C for a minimum 25 minutes with laundry detergent is recommended. The laundry can then be dried according to routine procedures.

**If machine washing is not possible**, linens can be soaked with soap & hot water in a large drum. A stick should be used to stir the content of the drum to avoid splashing. Check the linen for cleanliness. Rewash if it is dirty or stained. Finally, the laundry should be rinsed with clean water and the linens allowed drying fully in sunlight.

Curtains should be washed using the hot water cycle. For hot-water laundry cycles, wash with detergent or disinfect in water at 70°C for at least 25 minutes.

**Waste Management**

Keep separate colour coded bins/bags/containers in wards and maintain proper segregation of waste as per Bio Medical Waste Management (BMWM) Rules, 2016 as amended and Central Pollution Control Board (CPCB) guidelines for implementation of BMWM Rules.

---

7 Guidelines for management of handling, treatment and disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients, CPCB

*As per Available information till-30/3/2020*
Double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation ward so as to ensure adequate strength and no-leaks.

Collect and store Bio Medical Waste (BMW) separately prior to handing over the same CBMWTF. Use a dedicated collection bin labelled as ‘COVID-19’ to store COVID-19 waste and keep separately in temporary storage room prior to handing over to authorised staff of CBMWTF. BMW collected in such isolation wards can also be lifted directly from ward into CBMWTF collection area.

In addition to mandatory labelling bags/containers used for collecting BMW from the COVID-19 wards, should be labelled as “COVID-19 Waste”.

General waste not having contamination should be disposed as solid waste as per Solid Waste Management Rules, 2016.

Maintain separate record of waste generated from COVID-19 isolation wards.

Use dedicated trolleys and collection bins in COVID-19 isolation wards. A label “COVID-19 waste” to be placed on these items also.

The (inner and outer) surface of containers/bins/trolleys used for storage of COVID-19 waste should be disinfected with 1% sodium hypochlorite solution.

Depute dedicated sanitation workers separately for BMW and general solid waste so that waste can be collected and transferred timely to temporary waste storage area.

Management of Excreta of COVID-19 Patients

For smaller health care facilities, if space and local conditions allow, pit latrines may be the preferred option. Standard precautions should be taken to prevent contamination of the environment by excreta. These precautions include ensuring that at least 1.5 m exist between the bottom of the pit and the groundwater table (more space should be allowed in coarse sands, gravels and fissured formations) and that the latrines are located at least 30 m horizontally from any groundwater source (including both shallow wells and boreholes).

If there is a high groundwater table or a lack of space to dig pits, excreta should be retained in impermeable storage containers and left for as long as feasibly possible to allow for a reduction in virus levels before moving it off-site for additional treatment or safe disposal, or both. A two-tank system with parallel tanks would help to facilitate inactivation by maximizing retention times, as one tank could be used until full, then allowed to sit while the next tank is being filled. Particular care should be taken to avoid splashing and the release of droplets while cleaning or emptying tanks.

If the patient is unable to use a latrine, excreta should be collected in either a diaper or a clean bedpan and immediately and carefully disposed of into a separate toilet or latrine used only by suspected or confirmed cases of COVID-19. In all health care settings, including those with suspected or confirmed.

---

8 Water, sanitation, hygiene and waste management for the COVID-19 virus

As per Available information till-30/3/2020
COVID-19 cases, faeces must be treated as a biohazard and handled as little as possible. Anyone handling faeces should follow WHO contact and droplet precautions and use PPE to prevent exposure, including long-sleeved gowns, gloves, boots, masks, and goggles or a face shield. If diapers are used, they should be disposed of as infectious waste as they would be in all situations.

If a bedpan is used, after disposing of excreta from it, the bedpan should be cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, and then rinsed with clean water; the rinse water should be disposed of in a drain or a toilet or latrine.

**Precaution after completing the clean-up and disinfection**

- Staff should wash their hands with soap and water immediately after removing the PPEs and when cleaning and disinfection work is completed.
- Discard all used PPE in a double bagged biohazard bas, which should be securely sealed and labelled.

**Transport of the Patient**

- In general, transport and movement of the patient outside of their isolation ward should be limited to medically essential purposes. Like HCFs may consider providing portable x-ray equipment in patient isolation areas to reduce the need for patient transport.
- If being transported outside of the room, such as to radiology, HCWs in the receiving area should be notified in advance of transporting the patient.
- Patients should wear a facemask to contain secretions during transport. If patients cannot tolerate a facemask or one is not available, they should use tissues to cover their mouth & nose, and be covered with a clean sheet.
- If transport personnel must prepare the patient for transport (e.g., transfer them to the wheelchair or gurney), transport personnel should wear all recommended PPE (gloves, a gown, respirator and eye protection [i.e., goggles or disposable face shield that covers the front and sides of the face]).
- Once the patient has been transferred to the wheelchair or gurney (and prior to exiting the room), transporters should remove their gown, gloves, and eye protection and perform hand hygiene

**Implement empiric additional 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;

---

9 COVID-19 Outbreak Guidelines for Setting up Isolation Facility/Ward, NCDC
10 Infection prevention and control during health care when COVID-19 is suspected: interim guidanceWHO

*As per Available information till-30/3/2020*
Patients should be placed in adequately ventilated single rooms. 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.

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 removing and disposal of all PPE and hand hygiene should be carried out.

A new set of PPE is needed when care is given to a different patient.

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.

**Administrative Measures**

- Ensure that all necessary preventive and protective measures are taken to minimize occupational safety and health risks.
- Provide HCWs job- or task-specific education and training on preventing transmission of infectious agents, including refresher training.

---

11 Infection prevention and control during health care when COVID-19 is suspected: interim guidance

*As per Available information till-30/3/2020*
Ensure that HCWs are educated, trained, and have practiced the appropriate use of PPE prior to caring for a patient, including attention to correct use of PPE and prevention of contamination of clothing, skin, and environment during the process of removing such equipment.

Ensure uninterrupted supply of PPEs and its rational use.

Ensure an adequate patient-to-staff ratio.

Establish a surveillance process for acute respiratory infections potentially cause by COVID-19 among HCWs.

Monitor compliance with standard precautions and provide mechanisms for improvement as needed.

**Prophylaxis**

ICMR in its recommendation dated 22\(^{nd}\) March 2020 advises following drug and schedule.

- Asymptomatic healthcare workers involved in the care of suspected or confirmed cases of COVID-19: Hydroxychloroquine 400 mg twice a day on Day1, followed by 400 mg once weekly for next seven weeks to be taken with meals.
- Asymptomatic household contacts of laboratory confirmed cases: Hydroxychloroquine 400 mg twice a day on Day1, followed by 400 mg once weekly for next three weeks to be taken with meals.

**Precautions** – Hydroxychloroquine is not recommended for prophylaxis in children under 15 years of age.

The drug is contraindicated in persons with known cases of Retinopathy, known hypersensitivity to Hydroxychloroquine and 4-aminoquinolone compounds.

---

12 https://www.mohfw.gov.in/pdf/AdvisoryontheuseofHydroxychloroquinasprophylaxisforSARSCoV2infection.pdf
References:

1. Guidelines for Handling, Treatment, and disposal of waste Generated during treatment/Diagnosis/Quarantine of COVID-19 patients, March 2020, Central Pollution Control Board.
2. Infection prevention and control during health care when COVID-19 is suspected: interim guidance, WHO
3. CDC Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings
5. Guidelines for Setting up Isolation Facility/Ward- NCDC
6. Water, sanitation, hygiene and waste management for the COVID-19 virus
7. Interim Guidance from WHO- Consideration for Quarantine of individuals in the context of containment for Coronavirus disease (COVID-19)
9. Guidelines for management of healthcare waste as per BMW Management Rules, 2016, MoHFW, CPCB
10. National Guidelines for Infection Prevention and Control in Healthcare facilities, MoHFW, GOI