



National Guideline for Health Care Provider On Infection Prevention and Control of COVID-19 pandemic in Healthcare Setting

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THIS IS A LIVE DOCUMENT. IT WILL BE UPDATED FREQUENTLY AS PER SITUATION

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Introduction

Coronaviruses (CoV), are RNA enveloped viruses have a large family, commonly found in human and in different animals. In human, Coronaviruses cause illness ranging from the common cold to more severe diseases. Animal coronaviruses rarely infect human like MERS-CoV, SARS-Cov and currently a novel coronavirus SARS CoV-2 has been infecting human, spreading with human-to-human transmission and causing disease as COVID-19¹. **WHO declared COVID-19 a global pandemic on 11 March 2020.**

Objective of the guideline:

1. To control and prevent infection among HCW
2. To limit transmission of COVID-19 in healthcare settings and among others
3. To guide Health care personnel for personal protection
4. To guide Health case personnel in case management in hospital
5. To guide safe practice in handling cases in isolation unit
6. To guide safe practice in laboratory procedures

User of the guideline:

- Healthcare facility managers
- Doctors
- Nurses
- Medical Technologists
- Ward boy and cleaners
- Others

Case Definitions: (as per WHO)²

Suspect case

- A. A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath), AND with no other etiology that fully explains the clinical presentation AND a history of travel to or residence in a country/area or territory reporting local transmission (See situation report) of COVID-19 disease during the 14 days prior to symptom onset. OR

¹<https://www.cdc.gov/coronavirus/2019-ncov/summary.html>

² https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200303-sitrep-43-covid-19.pdf?sfvrsn=2c21c09c_2

- B. A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID19 case (see definition of contact) in the last 14 days prior to onset of symptoms; OR
- C. 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 etiology that fully explains the clinical presentation.

Probable case

A suspect case for whom testing for COVID-19 is inconclusive

- Inconclusive being the result of the test reported by the laboratory

Confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

Health care personnel for COVID 19 patients are at high risk of getting the infection.

Way of transmission of COVID-19:

The virus get transmitted mainly from person-to-person:-

- Close contact with infected person
- Respiratory droplets produced during coughing or sneezing(within about 3-6 feet)
- Touching contaminated surfaces (e.g. table top, door handle, bed rail, saline stand, patient's bed linen, bedside wall etc.)

Prevention of COVID-19:

- By preventing exposure to the virus through
 - Personal protection: use PPE, wash/sanitize hands
 - Decontamination of surfaces/rooms/equipment/items
 - Decontamination, management and dispose of waste
- No vaccine or specific antiviral available

Personal protection: Steps

- Perform hand hygiene (hand wash and/or hand rub)
- Avoid touching of eyes, nose and mouth during work
- Ensure wearing PPE during patient care

- Avoid travel to COVID-19 outbreak area
- Limit mass gathering or avoid crowd

Protect others: Steps

- If sick/infected, report to authority, follow treatment-management
- Stay at home or isolation facilities
- Wear mask
- Wash hand before or after work
- Maintain 3 feet distance from other
- Decontaminate surface/equipment/material



Infection prevention and control (IPC) strategies in Health care settings

- 1. Ensuring triage**
- 2. Follow standard precautions**
- 3. Implementing additional transmission based precautions**
- 4. Implementing administrative and environmental controls**

1. Ensuring triage for early recognition, and source control

Clinical triage includes a system for assessing suspected COVID-19 cases having respiratory tract infection with travel history at outdoor or admission site to allow early recognition of possible COVID-19 patients and immediate separation or isolation of suspected COVID-19 patients from other patients (source control).

Objectives:

- To facilitate the early identification of suspected COVID-19 case
- Separation of suspected COVID-19 from general patients

Target population:

- Patient with COVID-19 like clinical features (fever, cough with or without respiratory distress)
- COVID-19 suspected case (fever, cough with or without respiratory distress + travel/exposure history)

Manpower for Triage:

- Nurse/SACMO/outdoor staff/ward boy for initial screening
- Physician for consultation and management
- Ticket counter staff
- Cleaners

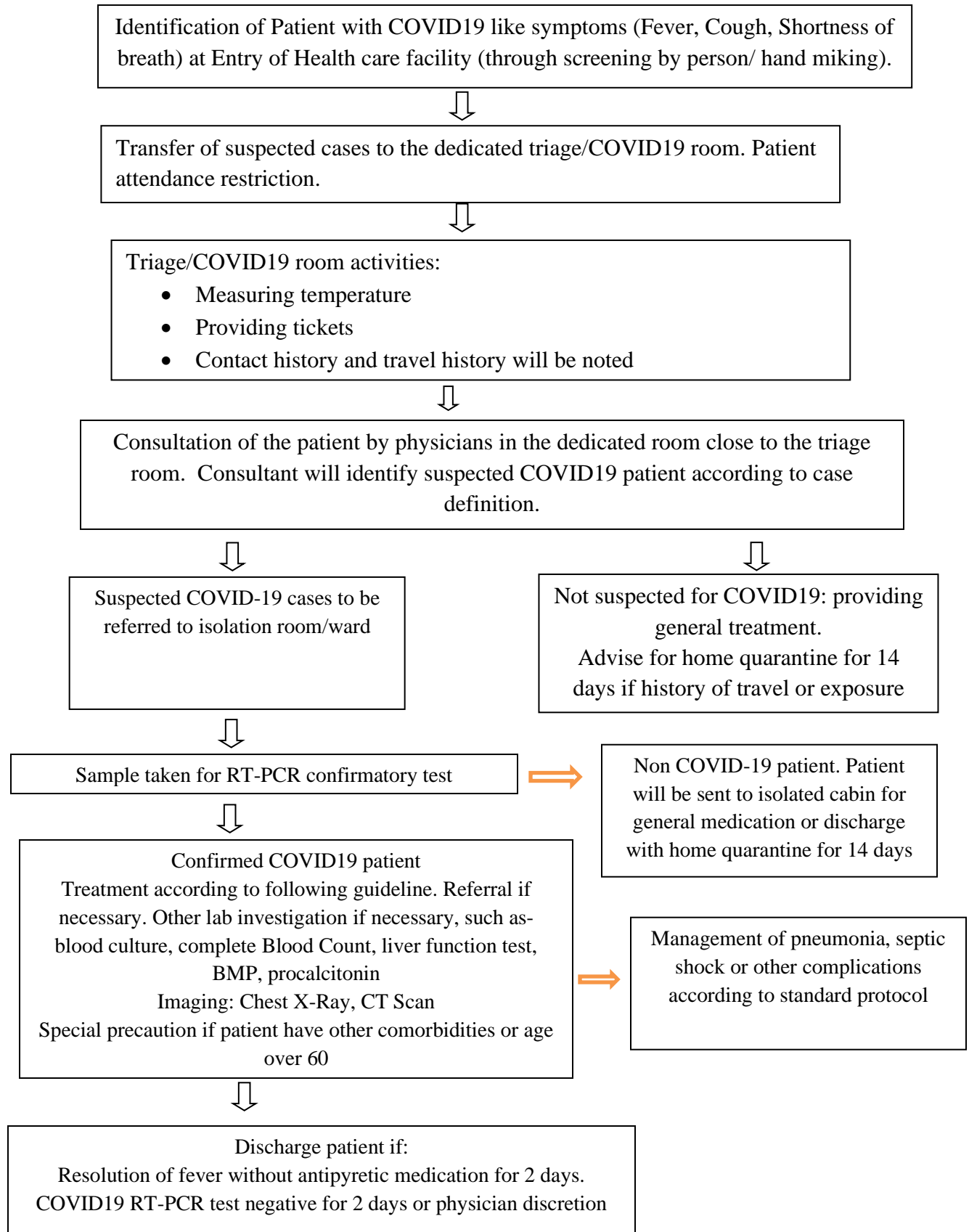
Logistics required:

- Thermometer
- Masks for suspected Covid19 cases
- Tissues
- Disposal bags with bin
- Personal protective equipment for health care staffs according (gloves, masks and/or respirators, gowns)
- Hand hygiene supplies (Soap-water or hand sanitizer).

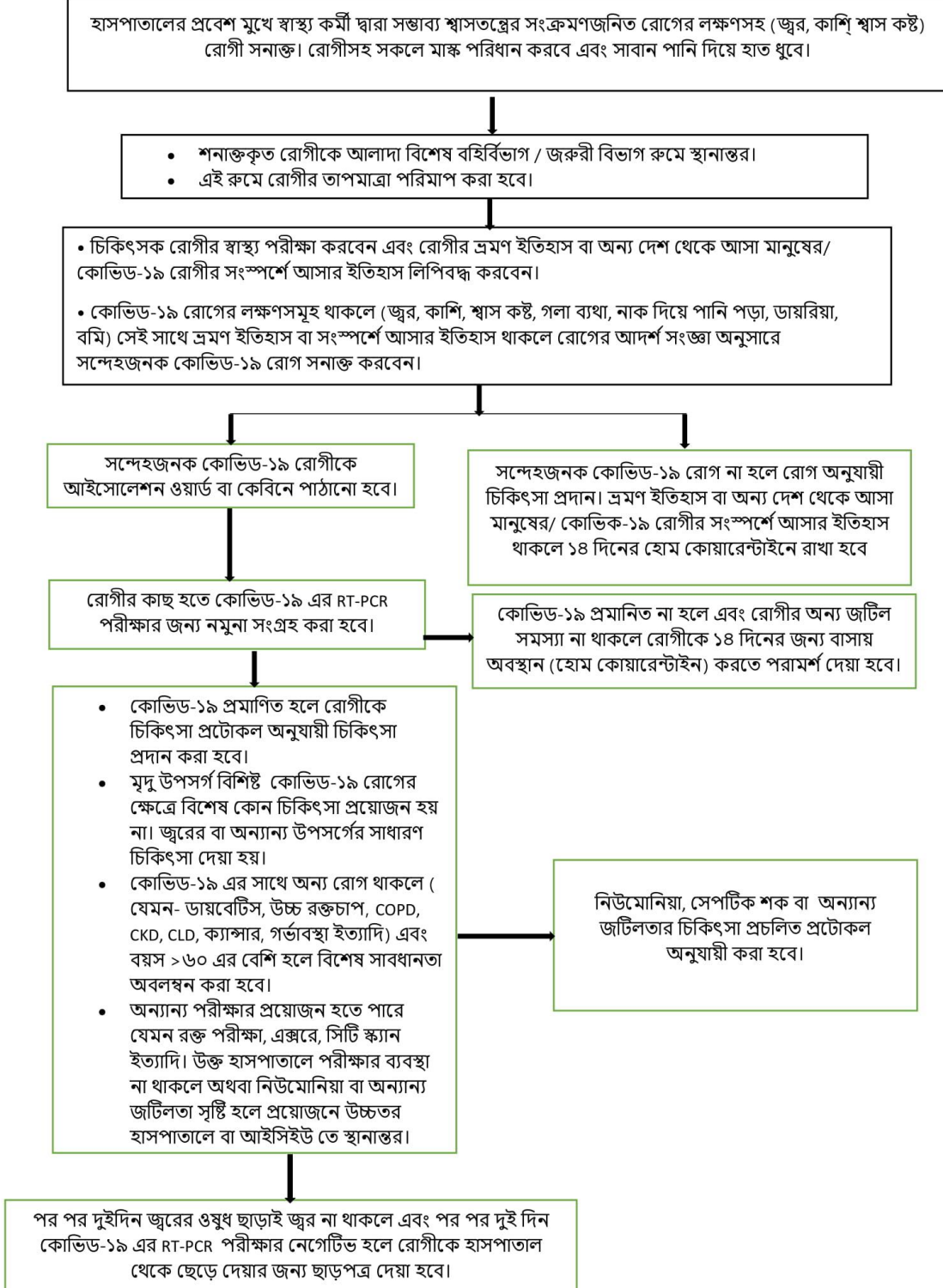
Infrastructure:

- A well ventilated separate **triage room**
 - Sitting arrangement (preferably at least 1 meter distance)
 - Dedicated wash room with hand wash facilities
- Dedicated entrance from outdoor to triage room and exits
- Ticket counter
- Citizen chartered

Flow Chart of COVID-19 Management in Hospital



হাসপাতালে কোভিড-১৯ রোগের ব্যবস্থাপনা



2. Application of Standard Precautions

Standard Precautions are the infection prevention practices that to applied for patient care and personal safety.

8 Elements for **Standard Precaution**

1. Hand hygiene (soap-water/ hand sanitizer/70% ethanol)
2. Respiratory hygiene and cough etiquette(cover cough-sneeze)
3. Personal protective equipment (PPE) use
4. Decontaminate PPE/equipment/work surface/table/room etc
5. Safe handling of sample, case and waste
6. Environmental decontamination and waste management

Health-care workers caring for patient under investigation for COVID-19 should implement standard infection control precautions. These include basic hand hygiene, use of personal protective equipment, respiratory hygiene and etiquettes, and environmental disinfection

2.1 Hand hygiene

Hand hygiene means cleaning your hands by using either soap-water or antiseptic hand rub (i.e. alcohol-based hand sanitizer including foam or gel)³

Based on WHO-defined **5 critical moments**, hand hygiene is required to reduce risk of pathogen transmission-

- 1) Immediately before touching a patient
- 2) Before cleaning/aseptic procedure (e.g. placing an indwelling device, opening venous access line, performing wound care)
- 3) After contact with body fluids or (secretions, excretions, and wounds) or contaminated surface
- 4) After touching a patient

³ Centre for Disease Control and Prevention (CDC)

- 5) After touching patient's surrounding (items or surfaces known or likely to be contaminated)

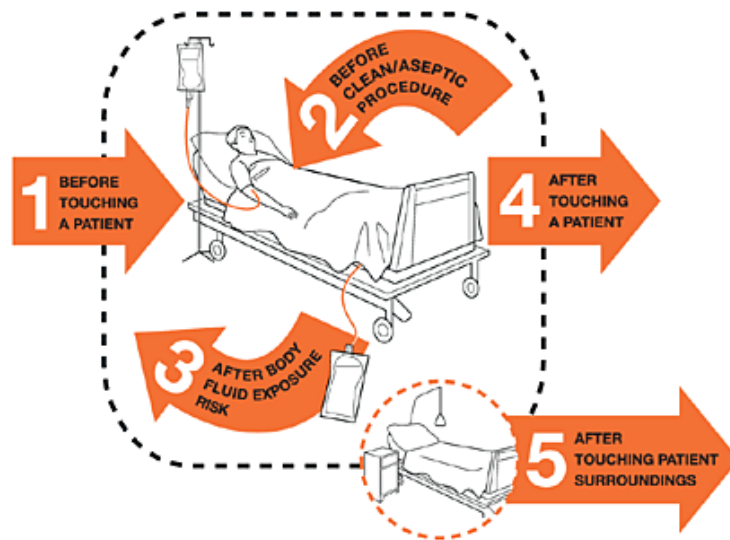


Figure: WHO recommended five-moments for hand hygiene

Ensure cleaning your hand with soap and water or with hand sanitizer

Table: When to perform hand hygiene at hospital settings

When to perform hand hygiene			
Immediately	Before	Between	After
Upon arriving at work	✓ Direct contact with patient	✓ Procedures on the same patient where soiling of hands is likely	✓ Contact with patient
	✓ Putting on gloves for clinical and invasive procedures (e.g. administering IV injections)		✓ Removing gloves
	✓ Medicine preparation		✓ Removing other PPE
	✓ Preparing, handling, serving, or eating food		✓ Contact with blood, body fluids, secretions, excretions, and wounds
	✓ Feeding a patient		✓ Contact with items or surfaces known or likely to be contaminated

Methods of hand hygiene⁴

Materials used for hand hygiene

- a) Soap and water
- b) Alcohol-based hand sanitizer

a. Hand washing with soap- water for **20-60** seconds. The steps of hand washing is given below-

⁴ For scrubbing and hand wash for operation theatre (OT), healthcare providers could follow “Manual of Basic surgical Skill” published by Sir Salimullah Medical College or basic surgical manual by Bangladesh College of Physicians & Surgeons(BCPS)



Figure: Hand-washing with soap and water

- **Wet** your hands with clean, running water, turn off the tap, and apply soap.
- **Lather** your hands by rubbing palm to palm and palm to dorsum with interlaced fingers for both hands
- Rotational rubbing of left thumb clasped in right palm and vice versa
- Rotational rubbing, backward and forward with clasped fingers of right hand in left palm and vice versa
- **Rinse** your hands well under clean, running water
- **Dry** your hands using a clean towel or air dry them



Figure: WHO recommended steps for washing hands with soap

b. Hand hygiene: Rub hand with alcohol-based formulation



Hand rubbing needs **20-30secs**. The steps of hand rubbing is given below---

- **Step 1:** Apply the alcohol-based hand sanitizer in a cupped hand (2 ml), covering all surfaces
- **Step 2:** Rub hand palm to palm
- **Step 3:** Right palm over left dorsum with interlaced fingers and vice versa
- **Step 4: Palm to palm with fingers interlaces**
- **Step: 5** Backs of fingers to opposing palms with Fingers Interlocked
- **Step 6:** Rotational rubbing of left thumb clasped in right palm and vice versa
- **Step 7:** Rotational rubbing, backward and forward with clasped fingers of right hand in left palm and vice versa
- **Step 8:** Dry your hand in air

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

🕒 Duration of the entire procedure: 20-30 seconds



Figure:WHO recommended steps for hand rubbing with alcohol based formulation

1. Perform hand wash with soap when your hands are **visibly dirty or soiled or contaminated with body fluids**
2. Alcohol-based hand sanitizer can be used, **if your hands are NOT visibly soiled or contaminated**
3. Keep finger nails short (less than $\frac{1}{4}$ inch long)
4. Finger ring is recommended to remove while handling patient

****In resource limited setting hand hygiene may not possible at all the recommended events. In local context, events for hand hygiene may need to be prioritized considering level of exposure (for example at handing suspected highly infectious patient).**

2.2. Respiratory hygiene and cough etiquette

These are infection prevention measures designed to limit the transmission of respiratory pathogens spread by droplet or airborne routes⁵

Person with respiratory signs and symptoms are recommended to apply measures given below-

- Cover nose and mouth when coughing/sneezing with tissue or mask
- Dispose of used tissues and masks
- And perform hand hygiene after contact with respiratory secretions
- In case of sudden episode, use upper arm during coughing and sneezing
- Turn your head away from people/patients or food while sneezing or coughing

In healthcare facilities following precautions to be maintained-

- Place acute febrile respiratory symptomatic patients at least 1 meter away from others in common waiting areas, if possible
- Post visual alerts at the entrance to health-care facilities instructing persons with respiratory symptoms to practice hygiene/cough etiquette
- Consider making hand hygiene resources, tissues and masks available in common areas and areas used for the evaluation of patients with respiratory illnesses
- Cleaning and disinfecting the environment and respiratory droplet



⁵ Centre for Disease Control and Prevention (CDC)

Remember:

In resource limited setting, during sudden episode of coughing and sneezing-

- using upper arm could be more convenient
- avoid using bare hand palm
- if use upper arm, do not touch your upper arm later

Video link: <https://www.youtube.com/watch?v=amhGusq3esM> (1m29s)

2.3. Personal Protective Equipment (PPE)

Personal protective equipment (PPE) refers to wearable equipment that is designed to protect healthcare personnel from exposure to or contact with infectious agents.⁶

Types of PPE used in healthcare settings

- Gloves-protect hands
- Gowns/aprons-protect skin and/or clothing
- Masks-protect mouth/nose
- Respirators-protect respiratory tract
- Goggles-protect eyes
- Face shield- protect face, mouth, nose and eyes (rarely used in our country)
- Shoe cover

Gloves

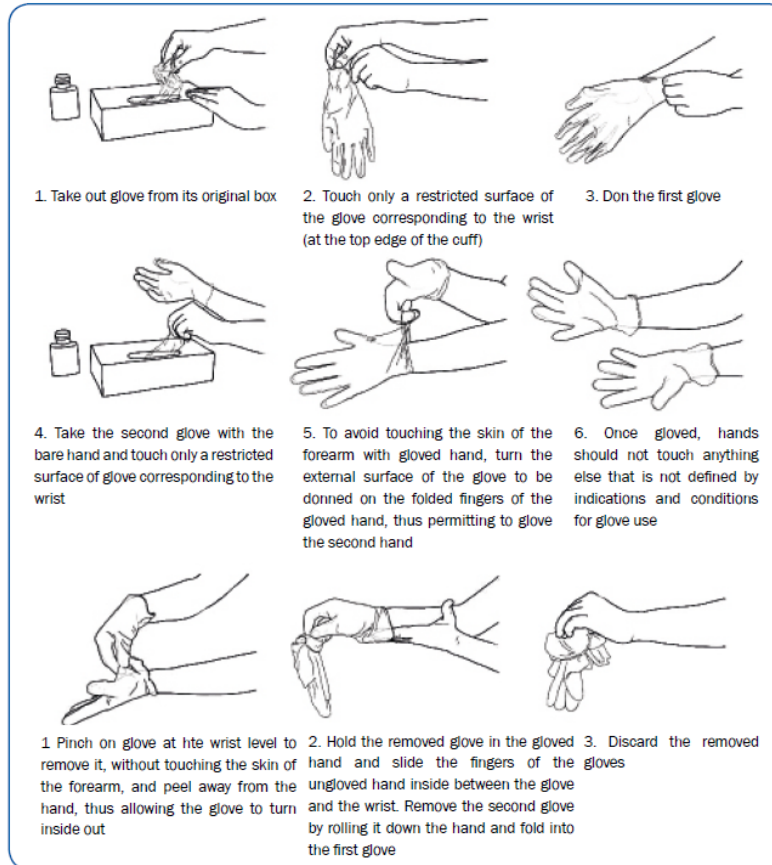
It impedes the contact of the skin of hand with contaminated surfaces

- Work from “clean to dirty”
- Protect yourself, patients and environment

When to change?

- Change gloves between patient care and procedure of another patient
- Change between procedure in the same patients if infectious materials in different areas
- Change gloves whenever break
- Remove after use, before touching non-contaminated items and surfaces, and before going to another patient
- Dispose in the designated place

⁶ Centre for Disease Control and Prevention (CDC)



Source: World Health Organization, *WHO Guidelines on Hand Hygiene in Health Care. Summary* Geneva: WHO, 2009. Figure 11.4, pages 22–23.

Figure: Donning and doffing of non-sterile gloves

Remember: Always perform hand hygiene immediately after removal of gloves

Gown

- It protects skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions
- Wear clean long-sleeve gown
- Remove soiled gown as soon as possible
- Wear sterile gown in case of invasive procedure
- If fluid penetration is likely, wear fluid resistant gown
- During use of double gloves, wear the big size first then small one (for example, 7" first then 6.5")

- **Avoid wearing apron/lab coat outside of the ward/lab**
- **Apron needs to be washed/decontaminated everyday**

Mask

- Protect the mucosa of nose and mouth from droplets, spills etc
- Wear mask tightly to the face
- Secure ties at middle of head and neck
- Should fully cover nose and mouth and prevent fluid penetration
- If wet with secretions, change promptly
- Discard immediately after use or wash/decontaminate in case of re-useable mask
- Dispose in the designated place and then perform hand hygiene

Masks are effective only when used in combination with frequent hand-cleaning and not touch

Who to use mask (according to WHO):

- People who have respiratory symptoms such as coughing, sneezing or difficulty breathing, including when they are seeking medical attention—to protect others around them.
- People (including family members) who are providing care to individuals with respiratory symptoms.
- Healthcare workers, when entering a room with patients or treating an individual with respiratory symptoms, and according to the type of care that will be provided.

Suspected patient needs to wear mask

Face protection

- Face shield is used to avoid splashes
- Wear mask and goggles during direct patient care
- Protect face from potential contact with infectious material

Goggles, where appropriate

- Provides barrier protection to eyes

- Should fit snugly over and around eyes
- Personal glass not a substitute
- Anti-fog feature improves clarity

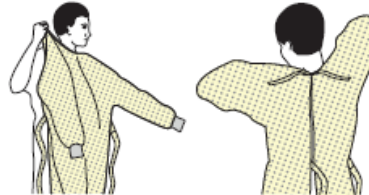
Donning and doffing of PPE⁷

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



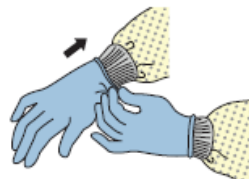
3. GOGGLES OR FACE SHIELD

- 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: How to don/wear and remove non sterile gloves

Video on doing and doffing of PPE⁸: <https://www.youtube.com/watch?v=Xkix8uweNsc> (1m51s)

⁷ in special situation such as in OT room, methods of PPE donning/doffing might not be followed

2.4. Safe injection practices, sharps management and injury prevention

Needle stick and other sharps injuries are a serious hazard in any healthcare setting.

When needle stick injury potentially can occur?

- Sudden patient movement during the injection
- Recapping needles
- Transferring body fluids between containers
- Failing to dispose of used needles in puncture resistant sharp container
- Disposing of used needles and other sharp instruments

If you get a needle stick injury

Following steps to be performed immediately-

- Wash the wound with soap water immediately
- Inform your supervisor and follow the instruction for further management

Protect yourself

- Make sure the red (waste disposal) container within your reach while using syringe
- Use of needle with caution
- Safe handling and disposal of needles in red container placed in the clinical ward

Recommendations on safe injection practice

- Prepare injections using aseptic techniques
- Do not use needles/syringe for more than one patient
- Disinfect the rubber septum on a medication vial with alcohol before piercing
- Do not use fluid infusion sets (e.g., IV bags, tubings) for more than one patient

2.5. Dealing of spillage

Any spills must be attended using PPE (mask, gloves, protective coat/cloths/PPE) and decontaminating material. Spill kit should be kept ready at all hospital wards or labs.

Spill Kit :

- i. Bucket and plastic scoop or dustpan

⁸ Gowning and gloving for operation theatre (OT), enthusiastic trainee could follow “Manual of Basic Surgical Skill” published by SSMC or basic surgical skill manual by BCPS

- ii. 1% Sodium Hypochlorite/sprit /ethanol
- iii. Biohazard Bag/waste bag

Steps:

- Wear appropriate protective clothing (mask, gloves and apron).
- Ventilate the area, if possible.
- Put 1% Sodium Hypochlorite or Sprits or Bleaching solution or Soap water on spills, and cover with paper towel/ any paper and wait for 15-30 mints
- Use a plastic scoop or dustpan to dispose of it in the sharps box/waste bin.
- Swab/mop up with decontaminant solutions.
- The spillage kit to be restocked.

2.6. Decontminate Environmental surfaces, linen and waste management

a. Environmental surface decontamination

Environmental cleaning or decontamination is to reduce the number of infectious agents that may be present on (frequently touched) surfaces and minimize the risk of transfer of micro-organisms from one person/object to another, thereby reducing the risk of cross-infection.

Infectious agents can survive in the environment and on surfaces for many hours or even days. Decontamination removes pathogens from contaminated surfaces and items.

Two key principles of environmental hygiene are-

i. **Step 1 – Cleaning:**

- Clean BEFORE disinfection
- Clean with moping /washing with water-detergent

ii. **Step 2 – Disinfection**

Disinfect items and surfaces that are:

- In contact with a patient's secretion, touch or mucosa
- Frequently touched by healthcare workers

Appropriate disinfectants for more details

Type of disinfectant/decontaminants are:

- Soap, detergent,
- 0.5-1% sodium hypochlorite solution, (Chlotech, chlorox)
- Bleaching solution(Mixture of 1 lit water + two table spoon full bleaching powder)

- 70% ethanol
- Lyzol
- Phenolic compound (e.g. Finis)
- 2% Gluteraldehyde (Cidex),
- Formaldehyde fumigation etc

Note: Use 1% Sodium Hypochlorite or Soap water or 70% Ethanol or UV as appropriate for decontamination of equipment, surface, table, beds, floors, toilets

- Prepare disinfectants in recommended dilutions
- Decontaminate all horizontal surfaces in patient care areas twice a day
- Decontaminate surfaces, tables, equipment in after discharge and before admission/arrive
- Decontaminate surface of examination table/other equipment in direct contact with patients between patients
- ***Dampen cleaning cloths before use—never use dry dusting or sweeping***

b. Linen

Use clean or sterile cloths (as appropriate).

- Change linen everyday
- Place soiled or used linen or cloths into a bag
- Decontaminate all cloths/dresses used by patients and health care workers by autoclave or washing with soap-water

c. Waste Management

- Keep waste in biohazard bag/waste bag in wastes bins
- Close/secure waste bag when two third to be filled up
- Decontaminate waste by autoclave or chemical(1% sodium hypochlorite) ;
- Incineration (ideal), if not available, do burning
- Burning waste in Pits (>8 feet deep) in premises, behind the hospital building

Table: Waste management in hospital

Type of waste	Example	Color of waste bin/container
General waste	Leftover meals, administrative rubbish, and paper, sweeping	Black
Clinical/lab waste without sharp objects	Materials used in lab /patient care	Yellow
Clinical waste with sharp objects	Needles or scalpel blades, knives broken glass material etc.	Red
Recyclable waste	Saline kits	Green
Liquid waste	Vomiting, blood	Blue



3. Additional Transmission Based Precaution

3.1. Basic Information

Contact transmission: Infection occurs through direct contact with source of infection or indirectly through contaminated objects.

Droplet Transmission: Viruses are transmitted through respiratory droplets (large droplets $> 5\mu\text{m}$), generated by coughing, sneezing or talking. Transmission via droplets occurs within 1 metre.

Airborne Transmission: Airborne transmission occurs through airborne droplet nuclei (small particle less than $5\mu\text{m}$) or evaporated droplets containing microorganisms that remain suspended in the air for long periods of time or with dust or by aerosol. Airborne precautions are required in following aerosol-generating procedures-

- Endotracheal intubation

- Open respiratory and airway suction
- Tracheostomy care
- Cardiopulmonary resuscitation
- Nasopharyngeal/throat/nasal swab collection process
- Bronchoscopy
- Pulmonary function testing
- Manual ventilation before intubation

Contact and Droplet precautions: Follow standard precautions such as hand sanitization, wear PPE by patient and HCW, placement of patient beds at more than 1 meter distance, and other IPC activities mentioned in the following sections.

Additional precautions to prevent airborne transmission following 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 uni-directional air flow when using mechanical ventilation
- Use a particulate respirator: N95 (disposable particulate respirator)
- Limit the number of persons present in the room to the absolute minimum required for the patient’s care and support.

3.2. Precautions in different settings

3.2.1 Community setting (Applicable to all staff)

Category of Individuals	IPC practices to be followed
Individuals without respiratory symptoms should	<ul style="list-style-type: none"> i. Avoid crowd or gathering ii. Maintain 1-2 meter distance from any patients/cases iii. Follow hand hygiene(hand wash with soap-water or alcohol-based hand rub) iv. Refrain from touching mouth and nose; v. Use medical mask vi. Wash hand returning home
Individuals with respiratory symptoms should (fever, cough and difficulty breathing etc) or suspected/probable COVID-19:	<ul style="list-style-type: none"> i. Frequent hand wash ii. Wear medical mask iii. Stay at home iv. Maintain 1-2 meter distance to other v. Call to Hotlines of IEDCR/DGHS(333,16263 etc) vi. Seek medical care: consultation, sample collection-lab test, treatment vii. Wash cloths with soap and water viii. Decontaminate floor, table, door locks with 1% sodium hypochlorite ix. If, respiratory distress, take admission with isolation center after discussion with doctors.

3.2.2. 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 2019-nCoV infection, the following measures should be adopted:

- Triage and early recognition
- emphasis on hand hygiene, respiratory hygiene; supplied masks to be used by patients with respiratory symptoms
- appropriate use of contact and droplet precautions for 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 refer to.

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

Specimens collected for laboratory investigations should be considered as potentially infectious. HCWs who collect, handle or transport any specimens should adhere rigorously to the following standard precaution measures and biosafety practices:

- Sample should be collected following standard precautions mentioned above and WHO guideline
- All personnel who transport specimens should be trained in safe handling practices and spill decontamination procedures
- Specimen to be kept in leak-proof container (primary) and appropriate specimen bags (i.e., secondary containers), and to be transported in cool box with 4 ice pack.
- Labeling of the specimen container (i.e., the primary container), and a clearly written laboratory request form containing patient's ID, age, date of birth and suspected COVID-19 of potential concern.
- Notify the laboratory as soon as possible that the specimen is being transported.

3.2.4. Transfer of Patients (to designated facility, if required)

- Avoid moving and transporting patients out of their room or area unless medically necessary.
- Use designated portable X-ray equipment and/or diagnostic equipment.
If transport is required, use predetermined transport routes to minimize exposure for staff, other patients and visitors, and have the patient using a medical mask
- PPE should be put on before handle patient.
- HCWs are to perform hand hygiene and to wear PPE
- Notify and keep ready the area/ward before the patient's arrival
- Decontaminate surfaces/equipment of patient's contact

- Limit the number of HCWs, family members and visitors for suspected and confirmed COVID-19 patient
- Maintain a record of all HCW/persons entering the patient’s room.

3.2.5. Case management in Isolation

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

- **Single isolation room** is recommended for patients for contact precautions.
 - Patient notes or bedside chart should be kept outside the room.
 - Donning and doffing should be done before entry and after exit from the room.
 - Door should be kept closed.
- **Cohorting**
 - When single rooms are not available, suspected COVID-19 patients should be grouped together in one ward or in one corner of a ward.
 - All patients’ beds should be placed at least 1 m apart
 - “A team” of HCWs should be designated to care exclusively for “COVID-19 cases” to reduce the risk of transmission
- **Spatial separation**
 - If it is not possible to separate infected and non-infected patients, then a spatial separation of minimum 3 feet distance between beds to reduce the risk of cross-infection.

3.2.6. Guidance for use of PPE in different settings

Setting	Target HCP or patients	Activity	Type of PPE or procedure
Triage (Clinical triage includes a system for assessing all patients at admission allowing early recognition of possible 2019-nCoV infection and immediate isolation of patients with suspected nCoV infection in an area separate from other patients(source control).	Healthcare personnel (HCP)	Preliminary screening not involving direct contact (observation and questioning)	<ul style="list-style-type: none"> • Maintain spatial distance of at least 1m • Use Medical mask
	Patients with respiratory symptoms	Any	<ul style="list-style-type: none"> • Use Medical mask
	Patients without respiratory symptoms	Any	<ul style="list-style-type: none"> • No PPE required
Laboratory	Laboratory technologist, Phlebotomist	Manipulation of respiratory and other samples	<ul style="list-style-type: none"> • Medical mask • Gown • Gloves • Goggle

			<ul style="list-style-type: none"> • N95/ face shield with medical mask (in case of aerosol generating procedures)
Outpatient facility			
Consultation room	Healthcare personnel	Physical examination of patient with respiratory symptoms.	<ul style="list-style-type: none"> • Medical mask • Gown • Gloves • Eye protection
	Healthcare personnel	Physical examination of patients without respiratory symptoms.	<ul style="list-style-type: none"> • PPE according to standard precautions and risk assessment.
	Patients with Respiratory symptoms	Any	<ul style="list-style-type: none"> • Provide medical mask.
	Patients without respiratory symptoms.	Any	<ul style="list-style-type: none"> • No PPE required
	Cleaners	Cleaning and disinfection	<ul style="list-style-type: none"> • Medical mask • Gown • Heavy duty gloves • Eye protection (if risk of splash from organic material or chemicals). • Boots or closed work shoes
	Ward boy	Attending Patients with respiratory symptoms	<ul style="list-style-type: none"> • Medical mask • Gloves
Traige/Waiting room	Patients with respiratory symptoms.	Any	<ul style="list-style-type: none"> • medical mask. • ensure spatial distance of at least 1 m from other patients.
	Patients without respiratory symptoms.	Any	<ul style="list-style-type: none"> • No PPE required

	Healthcare personnel (HCP)	Involved with ticket dispensing or other support	<ul style="list-style-type: none"> • Maintain spatial distance of at least 1m • Use Medical mask
Administrative areas Administrative staff	All staff, including healthcare workers.	Administrative tasks	<ul style="list-style-type: none"> • No PPE required
Inpatient facilities			
Patient room	Healthcare personnel	Providing direct care to suspected COVID-19 patients.	<ul style="list-style-type: none"> • Medical mask • Gown • Gloves • Eye protection (goggles or face shield).
		Providing direct care to confirmed COVID-19 patients.	<ul style="list-style-type: none"> • Medical mask • Gown • Gloves • Eye protection (goggles or face shield).
		Aerosol-generating procedures performed on suspected or confirmed COVID-19 patients	<ul style="list-style-type: none"> • N95 respirator/ face shield with mask • Gown • Gloves • Eye protection
	Cleaners	Entering the room of COVID-19 patients.	<ul style="list-style-type: none"> • Medical mask • Gown • Heavy duty gloves • Eye protection (if risk of splash from organic material or chemicals). • Boots or closed work shoes
	Visitors	Entering the room of a COVID-19 patient	<ul style="list-style-type: none"> • Medical mask • Gown • Gloves
Other areas of patient transit (e.g., wards, corridors).	All staff, including healthcare workers.	Any activity that does not involve contact with COVID-19 patients.	<ul style="list-style-type: none"> • No PPE required

Transfer			
Ambulance or transfer vehicle	HCP	Transporting suspected COVID 19 patients to the healthcare facility	<ul style="list-style-type: none"> • Medical mask • Gowns • Gloves • Eye protection
	Driver	Involved only in driving the patient with suspected COVID-19 and driver's compartment is separated from the COVID-19 patient	<ul style="list-style-type: none"> • Maintain spatial distance of at least 1m • No PPE required
		Assisting with loading and unloading patient with suspected COVID-19 patients	<ul style="list-style-type: none"> • Medical mask • Gowns • Gloves • Eye protection
		No direct contact with patient with suspected COVID-19, but no separation between drivers' and patients' compartments	<ul style="list-style-type: none"> • Medical mask
	Patient with suspected COVID-19 disease	Transport to the referral healthcare facility	<ul style="list-style-type: none"> • Medical mask
	Cleaners	Cleaning after and between transport of patients with suspected COVID-19 disease to the referral healthcare facility	<ul style="list-style-type: none"> • Medical mask • Gown • Heavy duty gloves • Eye protection (if risk of splash from organic material • Boots or closed working shoes

References- <https://www.cdc.gov/coronavirus/2019-ncov/index.html>

<https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19>

4. Sterilization and Disinfection

4.1. Sterilization

4.1.1. Definitions:

Sterilization: elimination of all micro-organisms (viruses, microscopic fungi, bacteria, both vegetative and spore forms). Operationally defined as a decrease in microbial load by 10^{-6} . Sterilization can be achieved by autoclave.

Disinfection: elimination of most micro-organisms present on a surface or object.

Decontamination: Decontamination is a process by which pathogenic organisms are killed.

Antiseptic: *is a non –toxic disinfection that can be used on skin and living tissues.*

4.2. Practices for Environmental Cleaning in Healthcare Facilities

4.2.1.1. Cleaning agents and disinfectants

i. 1% Sodium Hypochlorite

The solution should be prepared and used daily.

Contact time: 20-25 minutes is recommended.

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

4.1.2.2 Frequency of cleaning:

1. **High touch surfaces:** Decontaminate high touch surfaces like (doorknobs, telephone, call bells, bedrails, stair rails, light switches, lift-buttons, arm rests tables, air/ light controls, keyboards, switches, basin, wall areas around the toilet) to be done every 3-4 hours.

2. **Low-touch surfaces:** For Low-touch surfaces (walls, mirrors, etc.) mopping to be done at least once daily.

3. **In between patient care:** 70% alcohol containing hand sanitizer.

4. **Triage area:** Disinfection of high touch surfaces by 1% sodium hypochlorite solution to be done in every 3-4 hours. Hand sanitization to be performed.
5. **Mop floor** with routinely available disinfectant (1% sodium hypochlorite solution, phenol etc).
6. Remove used curtains/ fabrics/ quilts for washing in washing machine (preferable using hot water cycle).

Note: 1% sodium hypochlorite solution should be applied to surfaces using a damp cloth. They should not be applied to surfaces using a spray pack, as coverage is uncertain and spraying may promote the production of aerosols.

LIQUID SPILL MANAGEMENT:



1. Decontaminate spills of blood and potentially infectious materials.
2. Wear PPE and protective gloves.
3. Using a pair of forceps and gloves, carefully retrieve broken glass and sharps if any, and use a large amount of folded absorbent paper to collect small glass splinters. Place the broken items into the puncture proof sharps container.
4. Cover spills of infected or potentially infected material on the floor with paper towel/ blotting paper/newspaper.
5. Pour freshly prepared 1% Sodium hypochlorite solution and leaves for 20-30 minutes for contact.

6. Place all soiled absorbent material and contaminated swabs into a designated waste container.
7. Then clean the area with gauze or mop with water and detergent with gloved hands.

NB: Any material treated with hypo-chlorite solution should never be sent for incineration

Preparation of 1% Sodium hypochlorite Solution

1) From concentrated solution

- **5% Solution** is to be diluted 200 ml in 1L of water
- **10% Solution** is to be diluted 100 ml in 1L of water

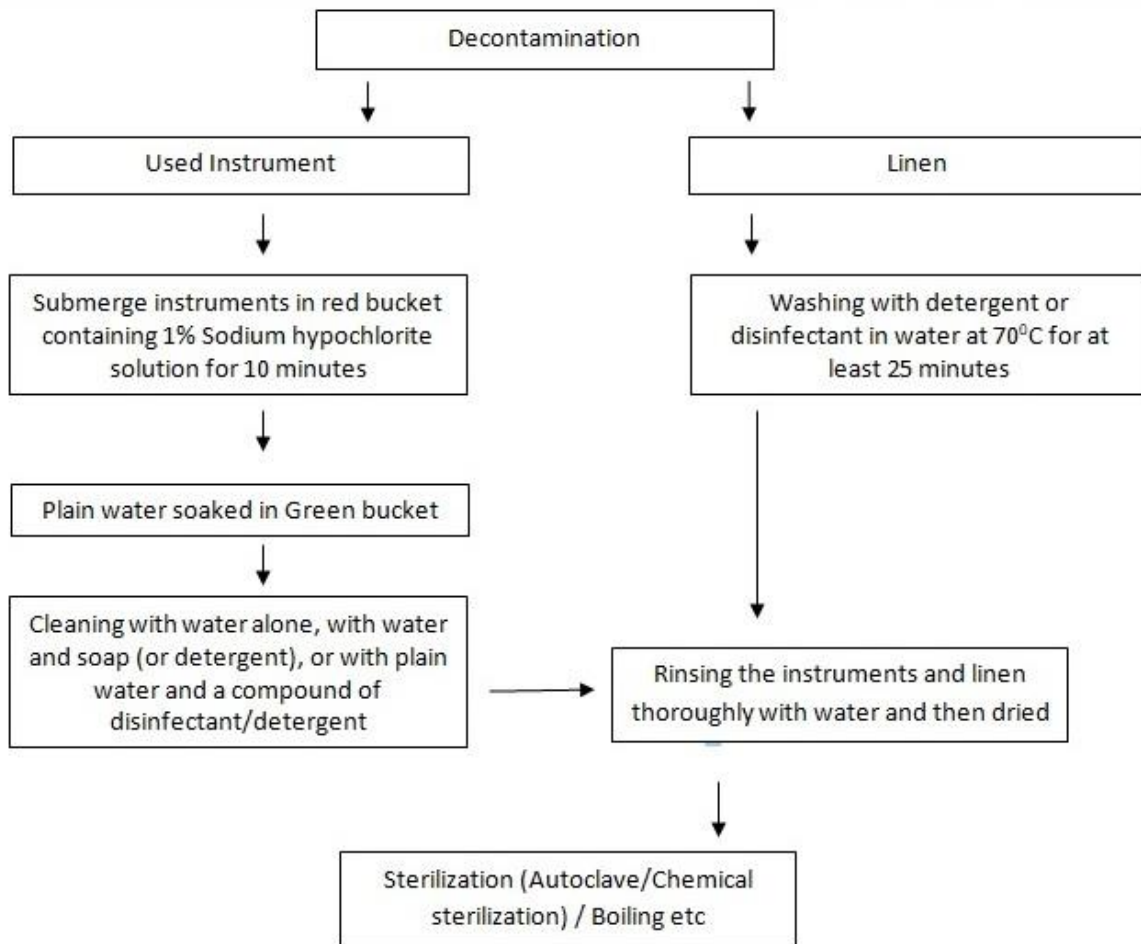
2) From powder form

- For 1% solution 10 L water + 400gm Bleach



Nb: Preparation should be done in red colored covered bucket and mix it by wooden stirrer. Water should be poured prior to given sodium hypochloride solution of powder

Equipment sterilization/decontamination procedure



Precautions to take after completing the clean-up and decontamination

1. Wash hands with soap and water immediately after removing PPE, cleaning/ disinfection work.
2. Discard all used PPE in a double-bagged biohazard bag, securely sealed and labeled. After sealing the bio-hazard bag, wear another pair of gloves and spray hypochlorite solution around the bio-hazard bag. Remove and discard the gloves in the yellow color/or designated bin.
3. The staff should be aware of symptoms, and should report to their occupational health service if they develop symptoms.

The **CORRECT** way to tie the bag



Always wear gloves



Bag shouldn't be more than 1/3 full



Twist the top



Tie a knot



5. Implementing Administrative Controls

Hospital administration is responsible for ensuring IPC practices mentioned in this guideline to contain COVID-19 infection in hospital setting. As per guidance of 'National Preparedness and Response Plan for COVID-19', relevant committees will supervise the IPC activities. Hospital administration will designate a healthcare personnel to be the focal of IPC activities of the healthcare setting. The responsibility of hospital administration further includes:

- establishing sustainable IPC infrastructures and activities
- educating patients' caregivers
- preventing overcrowding, especially in the emergency department
- providing dedicated waiting areas for symptomatic patients
- appropriately isolating hospitalized patients
- ensuring adequate supplies of PPE, disinfectant, soap, hand sanitizer
- Ensuring the adherence of IPC policies and procedures for all health care facilities.
- Ensure water, electricity and security

Public health administration (Institutional head, UHFPO, civil surgeon, divisional directors, DGHS) will take appropriate administrative measures related to the safety of the healthcare workers. These includes:

- provision of adequate training for HCWs
- ensuring an adequate patient-to-staff ratio
- Facilitating adequate supplies of PPE
- establishing a surveillance process for acute respiratory infections potentially caused by COVID-19 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.

Annex

Table: Recommendations for application of Standard Precautions for the care of all patients in all healthcare settings (include in the annexure)

Scenarios/events	Recommendations
After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts.	Hand hygiene
For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and non-intact skin	Gloves
During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated.	Gown
During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation. During aerosol-generating procedures on patients with suspected or proven infections transmitted by respiratory aerosols wear a fit-tested N95 or higher respirator in addition to gloves, gown and face/eye protection.	Mask, eye protection (goggles), face shield
Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene.	Soiled patient-care equipment
Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in patient-care areas.	Environmental hygiene
Handle in a manner that prevents transfer of microorganisms to others and to the environment	Linen and laundry
Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container	Needles and other sharps

Scenarios/events	Recommendations
Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.	Respiratory hygiene/cough etiquette