NATIONAL GUIDELINE ON INFECTION PREVENTION AND CONTROL IN HEALTHCARE SETTINGS

WITH ADDITIONAL MEASURES FOR COVID-19

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Directorate General of Health Services (DGHS)

Ministry of Health and Family Welfare (MOHFW)

Bangladesh

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Preface

Infection prevention and control (IPC) is an important part of any hospital management system. This is a vital component of a comprehensive approach to patients and healthcare workers safety, quality improvement, and improved health outcomes. The evolving landscape of emerging infectious diseases including the ongoing COVID19 pandemic necessitate increased awareness and attention to IPC. Bangladesh have started the preparation to control and contain this COVID19 pandemic in the country since January 2020 based on National Preparation and Response Plan. As a part of the preparation process, a guideline on Infection Prevention and Control in Healthcare Setting was developed by Directorate General of Health Services (DGHS) late March, 2020. To further update the document with the latest evidence and the WHO guidelines, we have worked with specialists from microbiology, virology, infectious disease specialist and public health specialists. With our combined effort, this guideline is finally updated to version 3. We hope that this guideline will cater the need of the health care workers and health managers working in the hospitals providing treatment to COVID or non COVID or both types of patients.

This is a living document. We will update the guidelines from time to time to incorporate latest evidences and recommendations of WHO. We welcome every suggestions and feedbacks on this document.

Prof. Dr. Shahnila Ferdousi,
Director, Disease Control &
Line Director, Communicable Disease Control,
DGHS

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Introduction

Infection Prevention and Control measures are very important for the safety of patients and healthcare workers. The ongoing COVID-19 pandemic has heightened the importance of effective IPC system in every health care facilities. To protect the healthcare workers from different infections and reduce the transmission of infections among general population, a strong IPC system is essential. This guideline will provide a detailed guidance on setting up and implementing this system in most hospitals of Bangladesh. This guideline also includes the additional measures need to be taken to prevent or control COVID-19 in hospital settings. The guideline has been developed by experts following the latest evidences and guidance from renowned public health organizations including World Health Organization and US-CDC.

Objective of the guideline

1. To control and prevent infection among HCW
2. To limit transmission of communicable diseases in healthcare settings with a major focus on COVID-19
3. To guide Health care personnel for personal protection
4. To guide Health care 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
- Other staffs related to healthcare service delivery

Sections of the Guideline

There are five sections in this guideline following the five IPC strategies required to prevent or limit transmission of communicable diseases in health care facilities:

1. Screening and triage for early recognition, and rapid implementation of source control measures
2. Applying standard precautions for all patients
3. Implementing additional precautions specific for COVID19
4. Implementing environmental and engineering controls
5. Implementing administrative controls

COVID-19 Case Definitions

(Followed by Public health surveillance for COVID-19 Interim guidance, 7 August 2020)

The case definitions for suspected and probable cases below have been revised to account for updated evidence on the most common or predictive symptoms and clinical and radiographic signs present in COVID-19 as well as known transmission dynamics.

Suspected COVID-19 case (two suspected case definitions A or B):

A. A person who meets the clinical AND epidemiological criteria:

Clinical criteria:

1. Acute onset of fever & cough OR

2. Acute onset of ANY THREE OR MORE of the following signs or symptoms: fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnea, anorexia/nausea/vomiting, diarrhoea, altered mental status.

Epidemiological criteria:

1. Residing or working in an area with high risk of transmission of the virus: for example, closed residential settings

and humanitarian settings, such as camp and camp-like settings for displaced persons, any time within the 14 days

prior to symptom onset;

OR

2. Bangladeshi residence or traveling to a area/country reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset. OR
3. Health care worker, working in health setting, including within health facilities anytime within the 14 days prior to symptom onset.

B. A patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last 10 days; and who requires hospitalization).

Probable COVID-19 case:

A. A patient who meets clinical criteria above AND is a contact of a probable or confirmed case, or epidemiologically linked to a cluster of cases which has had at least one confirmed case identified within that cluster.

B. A suspected case (described above) with chest imaging showing findings suggestive of COVID-19 disease

* Typical chest imaging findings suggestive of COVID-19 include the following (Manna 2020):

- chest radiography: hazy opacities, often rounded in morphology, with peripheral and lower lung distribution
- chest CT: multiple bilateral ground glass opacities, often rounded in morphology, with peripheral and lower lung distribution
- lung ultrasound: thickened pleural lines, B lines (multifocal, discrete, or confluent), consolidative patterns with or without air bronchograms.

C. A person with recent onset of anosmia (loss of smell) or ageusia (loss of taste) in the absence of any other identified cause.

D. Death, not otherwise explained, in an adult with respiratory distress preceding death AND who was a contact of a probable or confirmed case or epidemiologically linked to a cluster which has had at least one confirmed case identified within that cluster.

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.

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 environmental and engineering controls**
5. **Implementing administrative controls**

1. Ensuring triage for early recognition, and source control (focusing on COVID19)

Clinical triage includes a system for assessing suspected COVID-19 cases having respiratory tract infection with exposure 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 (case definition mentioned above)

Manpower for Triage:

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

Logistics required:

- Thermometer
- Masks for all cases
- Disposable towels
- Biohazar 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 2 meter distance)
    - Dedicated wash basin with hand wash facilities
- Dedicated entrance from outdoor/emergency to triage room and exits
- Ticket counter

For flow Chart of COVID patient management please see National COVID-19 Clinical Management Guideline

2. Application of Standard Precautions

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

7 Elements for **Standard Precaution**
1. Hand hygiene (soap-water/ alcohol based (70% alcohol) handrub) 2. Respiratory hygiene and cough etiquette (cover cough-sneeze) 3. Personal protective equipment (PPE) use (gloves, mask, gown, eye protection as needed) 4. Safe injection practices, sharps management and injury prevention 5. Safe handling, cleaning and disinfection of patient care equipment (including sample, patient care area) 6. Decontaminate environmental surfaces (patient care area, work surfaces, table, room etc.) and safe handling and cleaning of soiled linen 7. Waste management

Health-care workers caring for patients under investigation **for COVID-19 should implement** standard infection control precautions. These include basic hand hygiene, use of personal protective equipment and decontaminate these properly, 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)[1]

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

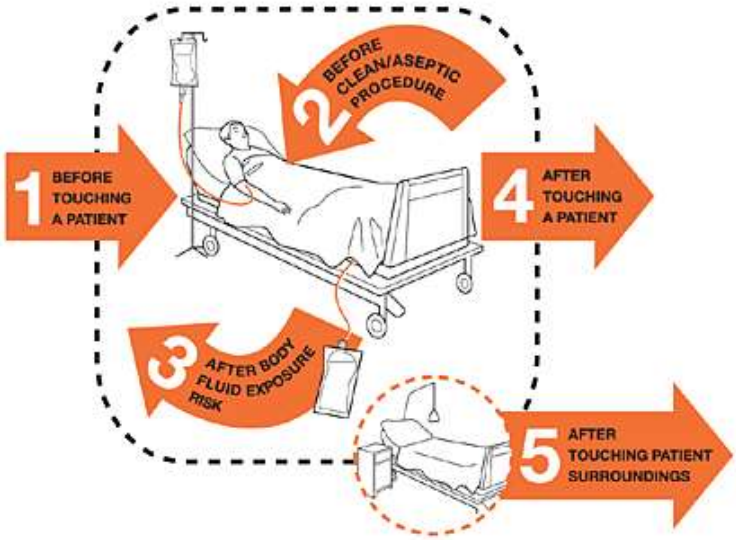


Figure: WHO recommended five-moments for hand hygiene

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

[1] Centre for Disease Control and Prevention (CDC)

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 hygiene[2]

Materials used for hand hygiene

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

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

[2] 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

Seven steps hand washing technique by WHO

1. Wet your hands with clean — preferably running — water.
2. Apply enough soap to cover all surfaces of your hands and wrists.
3. Lather and rub your hands together briskly and thoroughly. Make sure to scrub all surfaces of your hands, fingertips, fingernails, and wrists.
4. Scrub your hands and wrists for at least 20 seconds.
5. Rinse your hands and wrists under clean — preferably running — water.
6. Dry your hands and wrists with a clean towel, or let them air-dry.
7. Use a towel to turn off the faucet.

Soapy water can be prepared locally in low cost which is also effective to use for COVID-19

Figure: Preparation of soapy water

Figure: Steps of Hand Washing

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

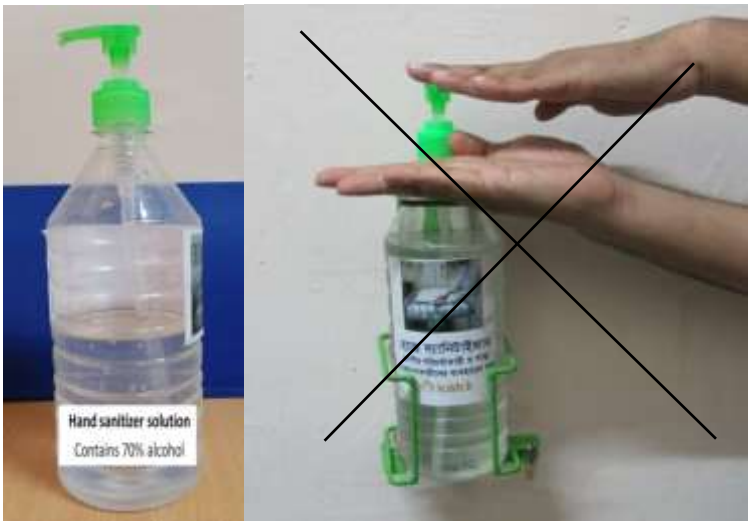


Figure: Hand sanitizer in local reusable bottle, can be mounted on the wall

Hand rubbing needs **20-30 seconds**. The steps of hand rubbing are 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

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 fingernails short (less than ¼ inch long)
4. Finger ring is recommended to remove while handling patient

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

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 routes[3]

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

- Wear surgical mask in public place specially when coughing/sneezing
- Dispose used tissues and masks in yellow waste bin
- 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 1-2 meter away from others in common waiting areas
- Post visual alerts at the entrance to health-care facilities instructing persons with respiratory symptoms to practice hygiene/cough etiquette
- Make hand hygiene materials, disposable towels and masks available in common areas and areas used for the evaluation of patients with respiratory illnesses

Figure: Avoid touching T-zone (eye, nose, mouth)[4]

[3] Centre for Disease Control and Prevention (CDC)

[4]Henry the Hand Foundation

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.[5]

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

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?

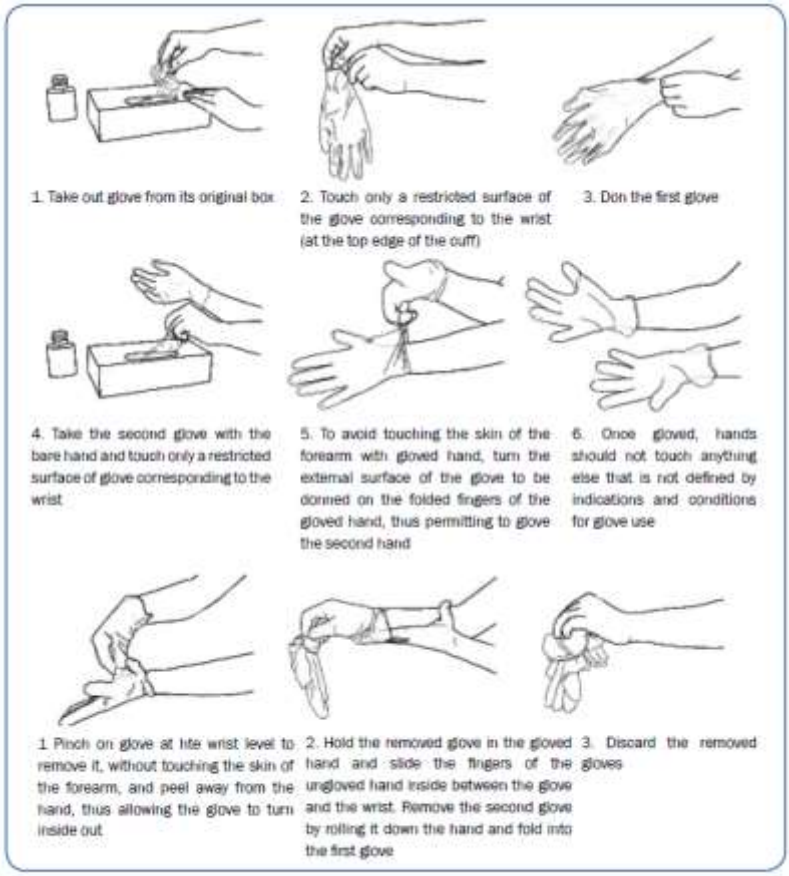
- Change gloves between patient care and procedure of another patient
- Change between procedure in the same patients if infectious materials in different areas
- Change gloves whenever break
- Remove after use, before touching non-contaminated items and surfaces, and before going to another patient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

No certain evidence available to support the use of double gloves vs. single gloves.[6]

[5] Centre for Disease Control and Prevention (CDC)

[6] Recommended in the guideline developed by an expert committee, members of three prominent international professional societies- Society for Healthcare Epidemiology of America (SHEA), Infectious Diseases Society of America and the Pediatric Infectious Diseases

However, only in case there is a chance of split or tear, may use double glove. In such case, wear the big size first then small one (for example, 7" first then 6).



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

Society. The SHEA Board of Trustees endorsed the guideline's Infection Prevention section (https://www.shea-online.org/index.php/journal-news/press-room/press-release-archives/778-new-guidelines-outline-covid-19-infection-prevention-and-control-evidence

- Remove soiled gown as soon as possible
- Wear sterile gown in case of invasive procedure
- If fluid penetration is likely, wear fluid resistant gown

- **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 reusable mask
- Dispose in the designated place and then perform hand hygiene

Healthcare personnel caring for patients with suspected or known COVID-19 use either a surgical mask or N95 respirator as part of appropriate PPE.

Masks in shortage scenarios: In contingency or crisis settings with a shortage of respirators, healthcare personnel caring for patients with suspected or known COVID-19 use a surgical mask or re-processed respirator instead of no mask as part of appropriate PPE.[8]

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.

According to the order issued by Bangladesh Government, wearing mask outside home is mandatory for all

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 is not a substitute
- Anti-fog feature improves clarity

Use of appropriate PPE during COVID-19 situation

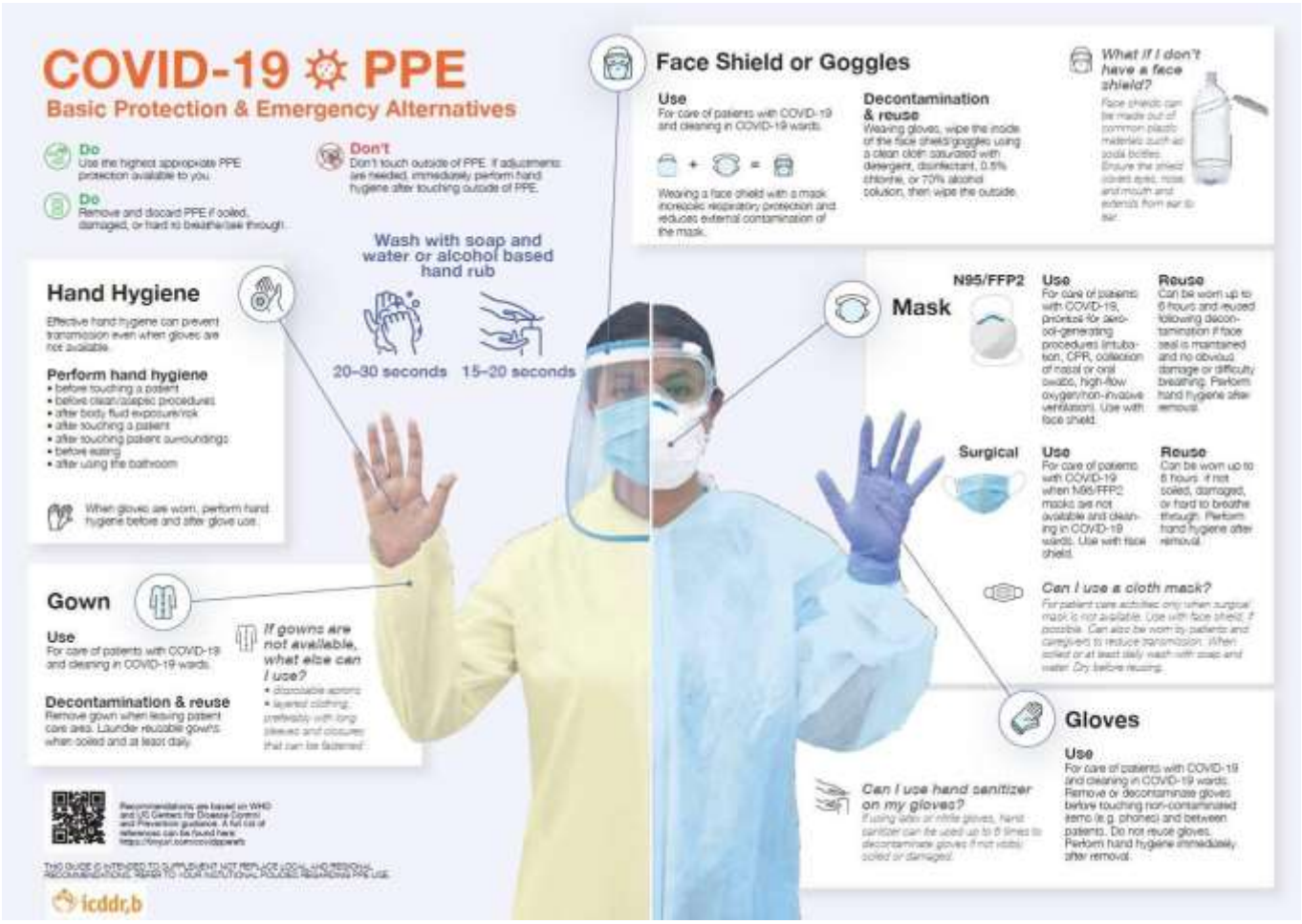


Figure: Using different types of PPE during COVID-19 situation

Donning and doffing of PPE[7]

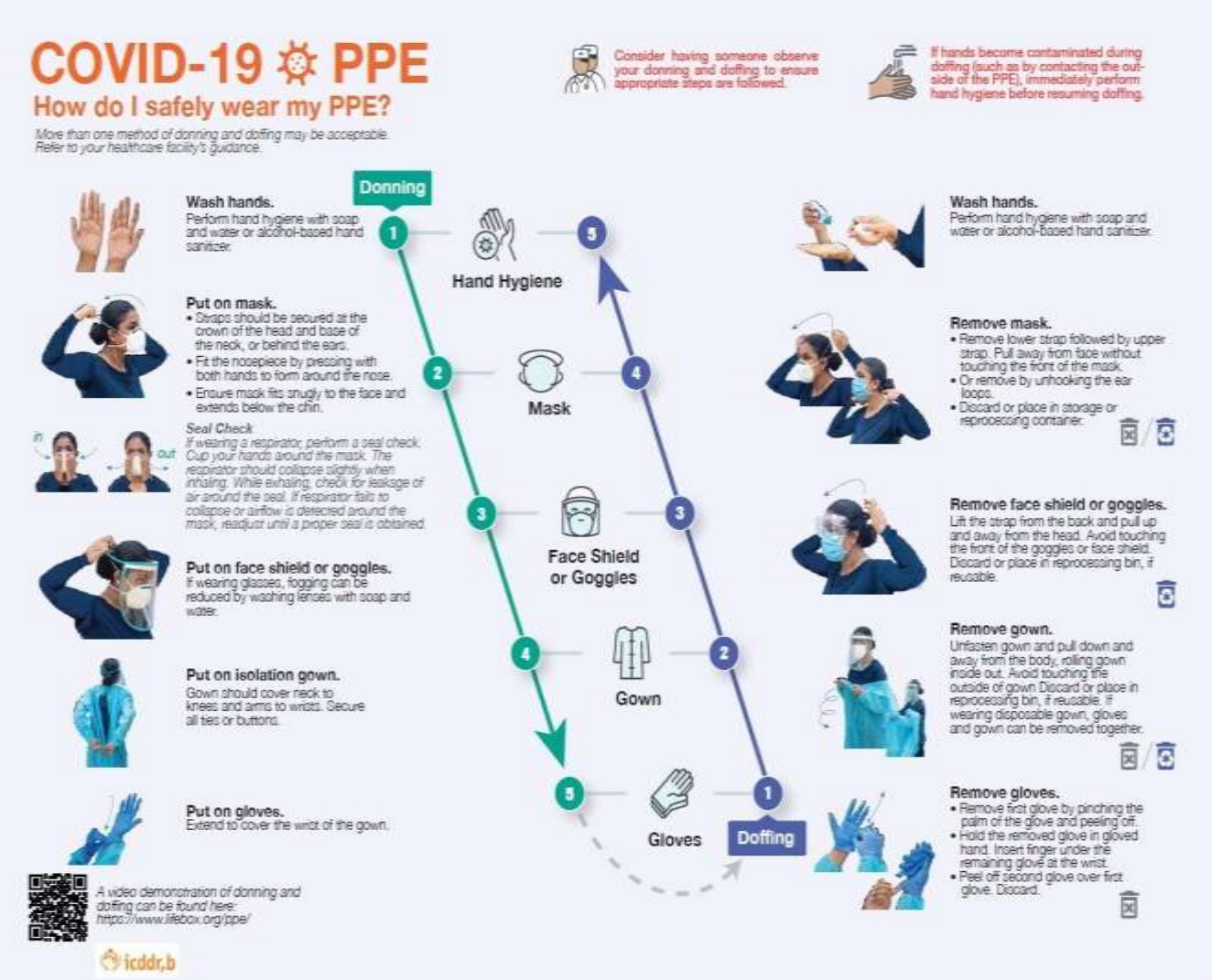


Figure: How to don (wear) and doff (remove)different PPE

[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

Needlestick 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 of a 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) and decontaminating material. Spill kits should be kept ready at all hospital wards or labs.

Spill Kit:

- Bucket and plastic scoop or dustpan
- 0.5% Sodium Hypochlorite
- Biohazard Bag/waste bag

Steps:

- Wear appropriate protective clothing (mask, gloves and apron).
- Ventilate the area, if possible.

- Apply paper towel/cotton/gauze over the spill
- Wearing heavy duty gloves soak the spill and dispose into yellow bin.
- Apply 0.5% Sodium Hypochlorite over the spill
- Keep it for 15 minutes
- Finally mop the area with detergent

2.6. Decontaminate Environmental surfaces (working area surfaces, floor, bed, table, room etc.) and safe handling of linen

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 microorganisms 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. S**tep 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 disinfectants/decontaminants are:

- Soap, detergent,
- 0.5% sodium hypochlorite solution, (Chlotech, chlorox)
- Bleaching solution
- 70% ethanol
- Lysol
- Phenolic compound (e.g. Finish)
- 2% Glutaraldehyde (Cidex)

Note: Use 0.5% 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 when patient is discharged and before new patient's admission/arrives
- 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***

Reference: For more details, see chapter 4 (Sterilization and Disinfection)

b. Safe handling of linen

Use clean or sterile cloths (as appropriate)

- Change linen everyday
- Place soiled or used linen into a bag and take to laundry
- Decontaminate used linen by immersing them in soap water (or detergent powder) for 15 minutes
- Then wash the linens as per the laundry protocol

2.7 Waste Management

Waste management should be conducted in coordination with the infection control team. There should be a person or persons responsible for the organization and management of waste collection, handling, storage and disposal. Waste management practices recommended as a general guide are:

- Keep waste in biohazard bag/waste bag in wastes bins
- Close/secure waste bag when two third to be filled up
- Record of generated wastes in designated temporary storage areas before disposal
- Treat the wastes by chemical decontamination (0.5% sodium hypochlorite) or autoclave;
- Wash used linen (apron, hospital gown, sheets and cotton blankets) in hot water (70°C to 80°C) with detergent and after that can soak in 0.1%NaOCL for 30 min then wash with water
- Manage wastes by incineration (ideal), if not available, do burning
  - Burning waste in burial pits (>8 feet deep) in premises, behind the hospital building

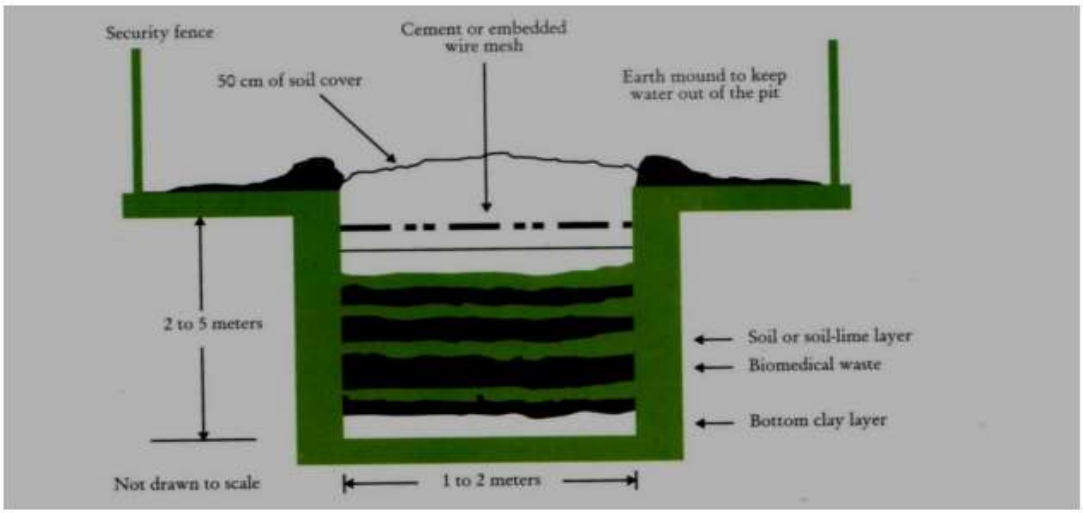


Figure: Layout Specifications for Burial Pit

- Set up a regular monitoring, reporting and appropriate capacity enhancement training plan on infection control as well as management of waste disposal.

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 for COVID-19

3.1. Basic Information

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

Droplet Transmission: Viruses are transmitted through respiratory droplets (large droplets > 5μm), generated by coughing, sneezing or talking. Transmission via droplets occurs within 1 metre as droplets do not remain suspended in the air and generally only travel a short distance (less than 1 metre).

Airborne Transmission: Airborne transmission occurs through airborne droplet nuclei (small particles less than 5μm) or evaporated droplets containing microorganisms that remain suspended in the air for long periods of time and can be transmitted to others over distances greater than 1 metre. Airborne transmission of the COVID-19 virus may occur under circumstances and settings where aerosol generating procedures (AGPs) are performed, in indoor crowded poorly ventilated settings.

Followings are example of aerosol generating procedures (AGPs):

- Endotracheal intubation
- Open respiratory and airway suction
- Tracheostomy
- Cardiopulmonary resuscitation
- Nasopharyngeal/throat/nasal swab collection process
- Bronchoscopy
- Pulmonary function testing
- Manual ventilation before intubation
- some dental procedures (such as high-speed drilling),
- non-invasive ventilation (NIV) such as bi-level positive airway pressure (BiPAP)
- continuous positive airway pressure ventilation (CPAP),
- high-frequency oscillating ventilation (HFOV),
- high flow nasal oxygen (HFNO), also called high flow nasal cannula,
- induction of sputum
- Nebulization (ultrasonic, jet)
- Collection of Oropharyngeal & Nasopharyngeal swabs

Contact and Droplet precautions: Contact and droplets precautions should be implemented by health workers caring for patients with COVID-19 at all times. It includes

- Continued implementation of standard precautions such as hand hygiene,
- Keep the patient in an isolated room. If that is not possible, cohort them, which means keep all of them similar cases in the same room
- Wear gloves, gown (for contact precaution) and surgical mask (for droplet precaution)
- After discharge of the patient, decontaminate the room and perform ‘deep cleaning’

- Use dedicated, stethoscope and thermometer for the patient
- Other IPC activities mentioned in the following sections.

Airborne precautions should be applied for 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 unidirectional air flow when using mechanical ventilation.
- For negative ventilation, duct system with exhaust fan and HEPA filter can be used.
- Use N95 mask or its equivalent
- Limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

CONSIDERATIONS DURING SHORTAGES OF N95 RESPIRATOR or EQUIVALENT

To combat the short supply of N95 respirator, the following recommended by CDC and WHO

1.Extended use of N95 or equivalent respirator Refers to wearing the same N95 respirator for repeated close contact encounters with several patients, without removing the respirator between patient encounters; as long as they are functional well (up to 8hr).

- Discard N95 respirator when contaminated with blood, respiratory or nasal secretions etc.
- Reduce surface contamination of respirators by placing a cleanable face shield or surgical mask over the respirator.
- surgical mask that is used over the N95 respirators should be discarded following use during aerosol generating procedures and replaced by new surgical mask over the N95 respirators.
- Perform hand hygiene before and after touching or adjusting the N95 respirator

2. **Limited Reuse of N95 respirator or equivalent** Refers to the practice of using the same N95 respirator for multiple encounters with patients but removing it ('doffing') after each encounter.

6-days reuse Strategy of N95 respirator or equivalent

1. It has recommended to issue six respirators to each HCW working in COVID area.
2. All HCWs should write their names on the masks, and put them in breathable paper bag. Mark the bag as day 1 to day 6.
3. The HCW will wear one respirator each day (shift) and store it in a breathable paper bag at the end of each shift.
4. The order of N95 respirator use should be repeated after minimum of six days' gap before reusing the same N95 respirator (i.e. on 7th day, the first day N95 mask can be repeated).
5. This will result in each HCW requiring a minimum of six N95 respirator or equivalent for 2 months.
6. These masks can be use for 5 such cycles and then discard them.

• MASK USED BY ONE HCW SHOULD NOT BE USED BY SOME OTHER HCW

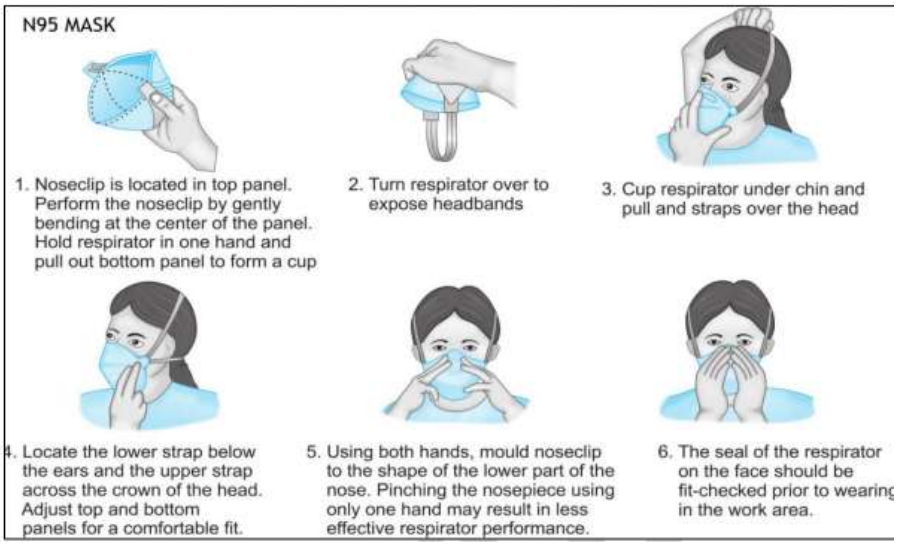
3. Reprocessing of N95 respirator followed by Reuse Due to severe shortage of N95 mask.

- Plasma sterilization by Vaporized Hydrogen Peroxide (VHP) is recommended method by WHO.

Seal check for N95 respirators or equivalent–

HCWs must perform seal checking every time they put on a N95 respirator or equivalent to ensure if it is properly fitted and functional.

1. Placement: The respirator is placed on the face and tied over the head and at base of the neck.
2. Sealing: N95 respirator is compressed to ensure a seal across the face, cheeks and bridge of the nose.
3. The positive pressure seal of N95 respirator is checked by gently exhaling. If air escapes, the N95 respirator needs to be adjusted.
4. The negative pressure seal of the N95 respirator is checked by gently inhaling. If the N95 respirator is not drawn in towards the face, or air leaks around the face seal; the N95 respirator is readjusted and the process is repeated.
5. If still not proper, then the respirator should be checked for any defect or damage.



NEED TO REMEMBER DURING USE OF MASK/ RESPIRATOR

Dos	Don'ts
Use mask only when clinically indicated · Surgical mask- when handling respiratory patients · N95 respirator or equivalent- when doing aerosol generating procedures	Do not use mask when clinically not indicated Wearing masks when not indicated creates a false sense of security that can lead to neglect the other essential measures such as hand hygiene practices
Always hold by its strings. Perform hand hygiene before and after using mask.	Don't touch/hold front/back part of mask
Fitting: Compress the mask to ensure a seal across nose bridge, face and cheeks	Do not allow tangling of mask around neck
Discard surgical mask after 4-6 hour and change N95 respirator or equivalent after 8 hour, in case of shortage of supply follow the reuse Strategy.	Do not keep using mask for longer time/days Do not wash mask and reuse
Discard in designated bag or closed bin	Do not throw masks here and there after use

KEEP IN MIND DURING USE OF MASK/ RESPIRATOR

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	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 eyes, mouth and nose; v. Use surgical mask vi. Wash hand returning home
Individuals with respiratory symptoms should (fever, cough and difficulty breathing etc.) or suspected/probable COVID-19**:**	i. Frequent hand wash ii. Wear surgical mask iii. Stay at home iv. Maintain 1-2meter 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 .5% sodium hypochlorite ix. If respiratory distress, take admission with an 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 COVID19 infection, the following measures should be adopted:

- Consider alternatives to face-to-face outpatient visits using telemedicine (e.g. telephone consultations or cell phone video conference) to provide clinical support without direct contact with the patient

- Screening, early recognition and isolation of patient with suspected COVID19
- Emphasis on hand hygiene, respiratory hygiene; supplied masks to be used by patients with respiratory symptoms
- Appropriate use of contact and droplet precautions when performing clinical examination on patients with suspected COVID19.
- Prioritization of care of symptomatic patients
- When symptomatic patients are required to wait, ensure they have a separate waiting area where

they can sit at least 1-meter apart and provide them with a mask.
- Educate patients and families about the early recognition of symptoms, basic precautions to be used and which health care facility they should refer to if any family member shows signs of COVID19.

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:

- Ensure that health workers who collect specimens, including nasopharyngeal and oropharyngeal swabs, use appropriate PPE.
- Nasopharyngeal/nasal and throat swab should be collected following standard precautions and airborne precautions
- All personnel who transport specimens should be trained in safe handling practices and spill decontamination procedures
- Specimen to be kept in specimen container (primary) and leak-proof specimen bags (i.e. secondary containers) and to be transported in a cool box with 4 ice packs.
- Deliver all specimens by hand whenever possible.
- Labeling of the specimen container (i.e., the primary container) and a clearly written laboratory request form containing patient's ID, patient's full name, date of birth and clinical diagnosis of the suspected case of COVID-19.
- 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 handling a 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. Placement of patients (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.

- For health-care facilities without adequate natural or mechanical ventilation, the following approaches can be considered:
    1. Installation of exhaust fans **2.** Installation of whirlybirds (e.g. whirligigs, wind turbines) **3.** Use of duct system with exhaust fan and HEPA filter

        - **Single isolation room** is recommended for patients **Patient notes or beds**ide charts 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 1-2 metre apart
    - "A team" of HCWs should be **dedicated** to care exclusively for "COVID-19 cases" to reduce the risk of transmission
    - Restrict HCWs from entering the Corona ward if they are not involved in direct care.
    - Restrict HCWs evaluating suspected cases of COVID-19 disease, one HCW can evaluate/screen, others can maintain distance and interact; thus minimizing the need for these individuals to go to healthcare facilities for evaluation.

- **Spatial separation**
    - If it is not possible to separate infected and non-infected patients, then a spatial separation of minimum 1-2 metre distance between beds to reduce the risk of cross-infection'

3.2.6. Patient care item

Stethoscope, Glucometer, thermometer has to be disinfected after each use and in between patient use with alcohol wipe.

3.2.7. Disinfection of the rooms:

- **Room of patient** must be frequently cleaned and adequately disinfected (e.g. at least twice daily or prior to use by another patient) focusing on patient care items , bedside equipment, frequently touched surface area and environmental surface (See details in environmental cleaning section).
- **Clean and disinfect bathroom**
    - **Private patient room toilet:** at least twice daily
    - **Shared toilets:** at least three times daily

APPROPRIATE USE OF PERSONAL PROTECTIVE EQUIPMENT

PPE should be used based on the risk of exposure; will vary according to the setting and type of personnel and activity. The overuse/misuse of PPE will have a further impact on supply shortages.

Activity by HCW	Type of PPE required
● ***Direct Contact without Aerosol-generating procedures of corona patients (suspected/confirmed)**	● should use the following PPE: Gowns, Gloves, Surgical mask and Eye protection (goggles or face shield)
● **Aerosol-generating procedures of corona patients (suspected/confirmed)**	● Gowns, Gloves, Eye protection (goggles or face shield), N95 Respirators or equivalent

(*Direct contact or close contact refers to coming closer to patients by less than one meter)

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 COVID19 infection and immediate isolation of patients with suspected COVID19 infection in an area separate from other patients(source control).	**Healthcare personnel (HCP)**	Preliminary screening not involving direct contact (observation and questioning)	● Maintain physical distance of at least 1 metre. ● Ideally, build glass/plastic screens to create a barrier between health care workers and patients ● Surgical mask ● When physical distance is not feasible and yet no patient contact, use mask and eye protection(goggles or face shield).
	Patients with symptoms Suggestive of COVID19	Any	● Maintain physical distance of at least 1 metre. ● Provide Surgical mask if tolerated by the patient. ● Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1 metre from other patients. ● Perform hand hygiene and have the patient perform hand hygiene.
	Patients without symptoms Suggestive of COVID19	Any	● Surgical mask ● Perform hand hygiene and have the patient perform hand hygiene
Laboratory	Laboratory technologists, Phlebotomists	Manipulation of respiratory samples Specimen handling for molecular testing would require BSL-2 or equivalent facilities. Handling and processing of specimens from cases with suspected or confirmed COVID-19 infection that are intended for additional laboratory tests, such as	● Maintain physical distance of at least 1 metre ● Surgical mask ● Eye protection (goggles or face shield) ● Gown ● Gloves ● Perform hand hygiene

		hematology or blood gas analysis, should apply standard precautions	● N95 or equivalent (**in case of aerosol generating procedures**)
Outpatient facility			
Consultation room	Healthcare personnel	Physical examination of patients **with** symptoms **Suggestive of COVID19**.	● surgical mask ● Gown ● Gloves ● Eye protection (goggles or face shield) ● Perform hand hygiene
	Healthcare personnel	Physical examination of patients **without** symptoms **Suggestive of COVID19**.	● PPE according to standard precautions and risk assessment. ● Perform hand hygiene
	Patients with **with** symptoms **Suggestive of COVID19**	Any	● Provide Surgical masks . ● Hand hygiene and respiratory etiquette.
	Patients without symptoms **Suggestive of COVID19**.	Any	● surgical mask ● Have the patient perform hand hygiene
	Cleaners	After and between consultations with patients with respiratory symptoms.	● Surgical mask ● Gown ● Heavy-duty gloves ● Eye protection (goggles or face shield). ● Closed work shoes ● Perform hand hygiene
	Ward boy	Attending Patients with symptoms **Suggestive of COVID19**	● Surgical mask ● Gloves
Triage/Waiting room	Patients with symptoms Suggestive of COVID19	Any	● Provide Surgical mask if tolerated. ● Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1 metre from other patients. ● Have the patient perform hand hygiene

	Patients without symptoms **Suggestive of Covid19**	Any	● Surgical mask ● Perform hand hygiene
	Healthcare personnel (HCP)	Involved with ticket dispensing or other support	● Maintain physical distance of at least 1 metre. ● Ideally, build glass/plastic screens to create a barrier between health care workers and patients ● Surgical mask ● When physical distance is not feasible and yet no patient contact, use mask and eye protection ● Perform hand hygiene
Administrative areas Administrative staff	All staff, including healthcare workers.	Administrative tasks	● Maintain physical distance of at least 1 metre between staff ● Surgical mask ● Perform hand hygiene
Inpatient facilities			
Patient room	Healthcare personnel	Providing direct care to suspected COVID-19 patients in the absence of aerosol-generating procedures .	● Surgical mask ● Gown ● Gloves ● Eye protection (goggles or face shield). ● Perform hand hygiene
		Providing direct care to confirmed COVID-19 patients in the absence of aerosol-generating procedures.	● Surgical mask ● Gown ● Gloves ● Eye protection (goggles or face shield). ● Perform hand hygiene
		Aerosol-generating procedures performed on suspected or confirmed COVID-19 patients	● N95 respirator or equivalent ● Gown ● Gloves ● Eye protection (goggles or face shield). ● Perform hand hygiene

	Cleaners	Entering the room of COVID-19 patients.	● Surgical mask ● Gown ● Heavy duty gloves ● Eye protection (goggles or face shield) ● Closed work shoes ● Perform hand hygiene
	Visitors	Entering the room of a COVID-19 patient	● Maintain physical distance of at least 1 meter ● Surgical mask ● Gown ● Gloves ● Perform hand hygiene
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.	● Maintain physical distance of at least 1 meter ● Surgical mask ● Perform hand hygiene
Transfer			
Ambulance or transfer vehicle	HCP	Transporting suspected COVID 19 patients to the healthcare facility	● Surgical mask ● Gowns ● Gloves ● Eye protection (goggles or face shield) ● Perform hand hygiene
	Driver	Involved only in driving the patient with suspected COVID-19 and driver's compartment is separated from the COVID-19 patient	● Maintain spatial distance of at least 1m ● Surgical mask ● Perform hand hygiene
		Assisting with loading and unloading patient with suspected COVID-19 patients	● Surgical mask ● Gowns ● Gloves ● Eye protection (goggles or face shield) ● Perform hand hygiene
		No direct contact with patient with suspected COVID-19, but no separation between drivers' and patients' compartments	● Surgical mask ● Perform hand hygiene

	Patient with suspected COVID-19 disease	Transport to the referral healthcare facility	● Surgical mask if tolerated ● Have the patient perform hand hygiene
	Cleaners	Cleaning after and between transport of patients with suspected COVID-19 disease to the referral healthcare facility	● Surgical mask ● Gown ● Heavy duty gloves ● Eye protection (if risk of splash from organic material or chemicals). ● Closed work shoes ● Perform hand hygiene

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

- Standard precautions should be applied at all times.
- Contact and droplet precautions should only be discontinued in consultation with clinicians and should take into consideration resolution of clinical signs and symptoms, or the number of days since a positive test was carried out with an upper respiratory specimen by molecular assay.
- For symptomatic patients, these additional precautions can be discontinued 10 days after symptoms onset and at least three consecutive days with neither fever nor respiratory symptoms.
- For asymptomatic patients, isolation can end 10 days after the initial positive RT-PCR test result. Although some patients have been tested positive for COVID-19 based on molecular assays several days after resolution of symptoms, it is still unknown whether these patients continue to shed the virus, since only RNA viral fragments have been detected.

4. Implementing environmental and engineering controls

4.1. Sterilization

4.1.1. Definitions:

Sterilization: Elimination of all microorganisms (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 microorganisms present on a surface or object.

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

***Antiseptic**: is a non –toxic disinfectant 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

Cleaning helps to remove pathogens or significantly reduce their load on contaminated surfaces and is an essential first step in any disinfection process. Cleaning with water, soap/detergent and some form of mechanical action (brushing or scrubbing) removes and reduces dirt, debris and other organic matter such as blood, secretions and excretions.

After cleaning, the following disinfectants and defined concentrations can be used on environmental surfaces to achieve a >3 log10 reduction of SARS-COV-2:

i. 0.5% (5000ppm) Sodium Hypochlorite solution:

   -- The solution should be prepared and used daily (within 24 hours).

ii. Alcohol 70-90% (e.g. isopropyl 70-90% or ethyl alcohol 70-90%):
   Can be used to wipe down surfaces where use of bleach is not suitable, e.g. metals.

iii. Hydrogen peroxide >0.5%.

*Contact time: minimum 1 minute is recommended for all disinfectants.

[In non-health care settings, sodium hypochlorite (bleach) may be used at a recommended concentration of 0.1% (1000 ppm). Alternatively, alcohol with 70%-90% concentration may be used for surface disinfection.]

4.2.1.2 Frequency of cleaning:

Table 4.1: Health-care setting: Recommended frequency of cleaning of environmental surfaces, according to the patient areas with suspected or confirmed COVID-19 patients.

Patient area	Frequency	Additional guidance
Screening / triage area	At least thrice daily	Focus on high-touch surfaces, then floors (last)
Inpatient rooms / cohort – occupied	Preferably three times daily, in particular for high-touch surfaces	Focus on high-touch surfaces, starting with shared/common surfaces, then move to each patient bed; use new cloth for each bed if possible; then floors (last)
Inpatient rooms – unoccupied (terminal cleaning)	Upon discharge/transfer	Low-touch surfaces, high-touch surfaces, floors (in that order); waste and linens removed, bed thoroughly cleaned and disinfected
Outpatient / ambulatory care rooms	After each patient visit (in particular for high-touch surfaces) and at least twice daily terminal clean	High-touch surfaces to be disinfected after each patient visit • Twice daily low-touch surfaces, thrice high-touch surfaces, floors (in that order); waste and linens removed, examination bed thoroughly cleaned and disinfected

Hallways / corridors	At least twice daily	High-touch surfaces including railings and equipment in hallways, then floors (last)
Patient bathrooms/ toilets	Private patient room toilet: at least twice daily Shared toilets: at least three times daily	High-touch surfaces, including door handles, light switches, counters, faucets, then sink bowls, then toilets and finally floor (in that order) • Avoid sharing toilets between staff and patients

1. **High touch surfaces:** Decontaminate high touch surfaces like (doorknobs, telephone, call bells, bed rails, stair rails, light switches, lift-buttons, sink bowls, arm rests tables, air/ light controls, keyboards, switches, basin, wall areas around the toilet) to be done every 8 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 0.5% sodium hypochlorite solution to be done in every 8 hours. Hand sanitization to be performed frequently.

5. **Mop floor** 8 hourly with routinely available disinfectant (by 0.5% sodium hypochlorite solution after cleaning properly).
6. Remove used curtains/ fabrics/ quilts for washing 2-3 times in a week (preferable using hot water with detergent or 0.1% bleach solution for 30 minutes then wash with running water).

[Note: 0.5% 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.]

4.3 Personal safety when preparing and using disinfectants:

Cleaners should wear adequate personal protective equipment (PPE) and be trained to use it safely. When working in places where suspected or confirmed COVID-19 patients are present, or where screening, triage and clinical consultations are carried out, cleaners should wear the following PPE:

- Gown
- Heavy duty gloves
- Medical mask
- Eye protection
- Face shield and
- Boots or closed work shoes.






Caution:

- ✔ Disinfectant solutions should always be prepared with proper dress in well-ventilated areas.
- ✔ Avoid combining disinfectants, both during preparation and usage, as such mixtures cause respiratory irritation and can release potentially fatal gases, in particular when combined with hypochlorite solutions.

Best practices for PPE for cleaning staff:

- Always perform hand hygiene directly before wearing gloves (donning) and directly after removal (doffing).

- Train cleaning staff on appropriate use, application and removal of required PPE for all environmental cleaning procedures and tasks for which they are responsible.
- Remove wristwatches and hand jewelry before starting cleaning tasks—these items can tear gloves and can also harbor microorganisms.
- Keep fingernails short and free of nail varnish to prevent tearing of gloves and picking up dirt and bacteria.
- Put on all required PPE before entering a patient care area and remove it (for disposal or reprocessing, if reusable) after leaving that area.
- Include required PPE for specific tasks in standard operating procedures and other visual job aids (e.g., signage for isolation areas, preparation of solutions).
- Use SDS to determine required PPE for preparing environmental cleaning products and solutions (e.g., manual dilutions).
- All PPE (reusable and disposable) should be in good supply, well maintained (good quality, appropriately stored stocks), cleaned before use, and in good repair.
- Reprocess (i.e., clean and disinfect) all reusable PPE at least once a day.
- Conduct regular fit-testing for cleaning staff who are required to wear respirators.
- Use chemical-resistant gloves (e.g., nitrile, latex) for preparation of cleaning chemicals.
- Use reusable rubber gloves for cleaning. Submerge the gloves in detergent water for 30 minutes then wash and dry it for reuse.

4.4 Preparation of Hypochlorite Solution

Nb: Preparation should be done in a red colored covered bucket and mix it by wooden stirrer. Bleach should be poured in the previously filled bucket.

4.4.1 Calculation of sodium hypochlorite concentrations:

$$\frac{\%\ chlorine\ in\ liquid\ sodium\ hypochlorite}{\%\ chlorine\ desired} - 1$$

$$= Total\ parts\ of\ water\ for\ each\ part\ sodium\ hypochlorite$$

Example 1:

$$\frac{5\%\ chlorine\ in\ liquid\ sodium\ hypochlorite}{0.5\%\ chlorine\ desired} - 1$$

$$= 9\ parts\ of\ water\ for\ each\ part\ sodium\ hypochlorite$$

To prepare 1:10 (0.5%) bleach solution add one volume of household bleach to nine volumes of clean water.

- 100ml 5% Bleach + 900 ml water = 1 Liter 0.5% Bleach Solution
- 1 Liters 5% Bleach + 9 Liters water = 10 Liters 0.5% Bleach Solution
- 2 Liters 5% Bleach + 18 Liters water = 20 Liters 0.5% Bleach Solution

To prepare 1:50 (0.1%) bleach solution add one volume of household bleach to 49 volumes of clean water.

- 20ml 5% Bleach + 980 ml water = 1 Liter 0.1% Bleach Solution
- 400ml 5% Bleach + 19.6 Liter water = 20 Liters 0.1% Bleach Solution

Example 2:

$$\frac{10\%\ chlorine\ in\ liquid\ sodium\ hypochlorite}{0.5\%\ chlorine\ desired} - 1$$

$$= 19\ parts\ of\ water\ for\ each\ part\ sodium\ hypochlorite$$

To prepare 0.5% bleach solution from 10% sodium hypochlorite add one volume of 10% bleach to 19 volumes of clean water.

- 50ml 10% Bleach + 950 ml water = 1 Liter 0.5% Bleach Solution
- 500ml 10% Bleach + 9.5L water = 10 Liter 0.5% Bleach Solution
- 1L 10% Bleach + 19 L water = 20 Liter 0.5% Bleach Solution

4.4.2 Calculation of Chlorine solutions from Calcium hypochlorite:

$$\frac{\%\ chlorine\ desired}{\%\ chlorine\ in\ hypochlorite\ powder\ or\ granules} \times 1000$$

$$= Grams\ of\ Calcium\ hypochlorite\ powder\ for\ each\ liter\ of\ water$$

Example:

$$\frac{0.5\%\ chlorine\ desired}{35\%\ chlorine\ in\ hypochlorite\ powder\ or\ granules} \times 1000$$

$$= 0.0143 \times 1000$$

$$= 14.3\ Grams\ (1\ Tablespoon)$$

Therefore, we must dissolve 14.3 grams of calcium hypochlorite powder in each liter of water used to make a 0.5% chlorine solution.

0.1% chlorine solution can also be prepared by dissolving 2.86 grams of calcium hypochlorite powder in each liter of water.

[NOTE: *Please look at the original concentration of chlorine on the outer surface of the bottle or packet before making a working solution.

* Bleach solution is better, safer and easier than powder form for making a working solution. Best try to use a 5% or 10% solution form.

* Hypochlorite powder must contain at least 35% chlorine to prepare 0.5% hypochlorite solution from powder form.]

4.5 Triple bucket method:

1.

1st bucket with detergent water/ cleaning solution for rinsing:	Mop rinsed again in this water.
2nd bucket with fresh water:	Dirty mop is sponged or rinsed. The rinse water bucket allows the mop to be rinsed and wrung out before it is re-dipped into the prepared solution. This extends the life of the solution which saves both time and material costs.
3rd bucket fresh disinfectant solution:	Mop is immersed in this solution and the floor mopped literally.
Another one bucket is needed more for rinsing the mop (in a heavily soiled floor one bucket with Detergent and warm water before disinfectant mopping).	

2. Use a separate mop for different areas (patient area, nurses room-store room, varanda-pantry, bathroom-to dry the floor).

3. Cleaning should progress from the least soiled (cleanest) to the most soiled (dirtiest) areas, and from the higher to lower levels so that debris may fall on the floor and is cleaned lasting a systematic manner to avoid missing any areas.

4. At high risk of COVID-19 virus contamination, use a new cloth to clean each patient bed.

3. Wash the mop under running water before doing wet mopping.

4. Do not double dip mop as dipping it multiple times may be re-contaminated.

5. Soiled clothes should be reprocessed properly after each use.

6. Change solution after cleaning area of 240 square feet.

7. Use a checklist for every cleaning and take the signature of the cleaner.

8. **Mopping method:**

a. Place a 'wet floor' caution sign outside of the room or area being mopped.

b. Divide the area into sections (e.g.corridors may be divided into two halves, lengthwise so that one side is available for movement of traffic while the other is being cleaned).

c. Immerse mop in cleaning solution and wring out.

d. First paying particular attention to removing soil from corners.

e. In open areas use a **figure eight stroke** in open and wide spaces, overlapping each stroke and turn the mop head over every five or six strokes.

f. While in small spaces starting in the farthest corner of the room, drag the mop toward you then push it away, working in straight, slightly overlapping lines and keeping the mop head in full contact with the floor.

g. Repeat until the entire floor is done.

After Cleaning:

1. Clean mop head after use with detergent and hot water dry in sunlight-mop head up and handle down.
2. In high risk areas keep a separate set of mops for each shift.
3. Clean the buckets with detergent and water and store it dry.

4.5 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 0.5% 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.

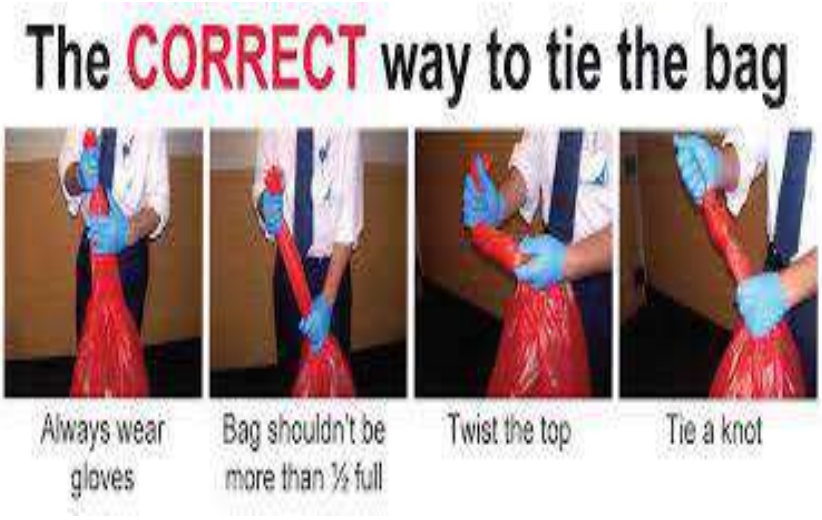
[NB: Any material treated with hypo-chlorite solution should never be sent for incineration.]

4.6. Disinfection in waste disposal system:

1. After cleaning separate the waste and should be placed in different colored bins according to instructions.

2. Spray hypochlorite solution within the biohazard bag and knot it when wastes fill-up the half portion of the bag.

3. After giving knot again spray hypochlorite solution outside the biohazard bag.



4.7 Precautions to take after completing the clean-up and decontamination

1. Wash hands with soap and water immediately after removing PPE, cleaning/ disinfection work. Take a bath with soap and water if possible.

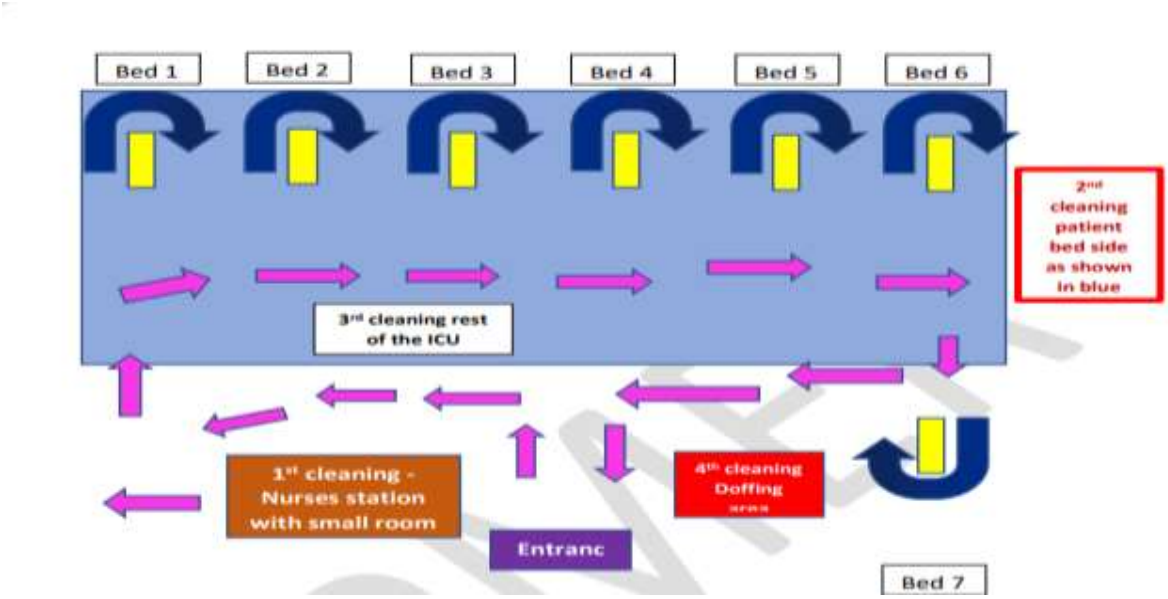
2. Discard all used PPE in a double-bagged biohazard bag, securely sealed and labeled. After sealing the bio-hazard bag, wear another pair of gloves and spray hypochlorite solution around the bio-hazard bag. Remove and discard the gloves in the yellow color/or designated bin.

3. The staff should be aware of symptoms and should report to their occupational health service if they develop symptoms.

4.8 Cleaning Protocol in COVID ICU

- Always start from clean to dirty area and from top to bottom.
- Always the surface disinfection has to be done 1 st followed by floor cleaning and last washroom cleaning.
- Different mops and buckets with labels has to be used for different designated areas. e.g. one for nurse's station, one for doffing area, one for patient beds and one for rest of the ICU.
- No washing and brooming have to be done inside ICU.
- Only soap and water and disinfectant has to be used for cleaning every 4th hourly.

Sequence of cleaning inside ICU:



I - Always to be started with nurse's station 1 st

- Tissue paper Dispenser
- Computer
- Keyboard & mouse
- Intercom
- Chair arms
- Nursing counter table
- Crash cart
- Medicine trolley
- Injection trolley Followed by these, floor cleaning near to nursing station has to be done.

II - Patient area has to be cleaned 2nd:

Patient beds have to be placed 1-2 meter away from each other and 1-2 meter away from the wall.

- Switch board (alcohol wipes to be used)- DO NOT SPRAY
- Bed side table with case sheet
- Ventilator screen to be cleaned 1st then to the other parts of the ventilator
- CCM and SPO2 monitor
- Infusion pump
- IV stand

Cleaning of the cot:

- 1st - Head end rails
- Side rails
- Foot end rails

- Cot wheels

Floor cleaning near the patient beds: Patients bed side floor has to be cleaned, starting from the foot end and proceeding towards the head end. (all the beds have to be cleaned in this manner).

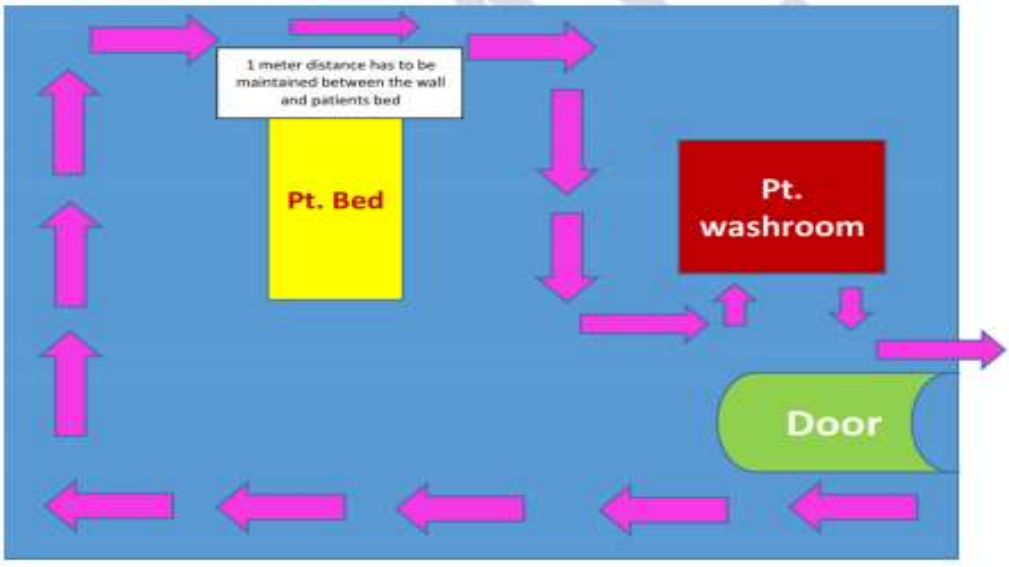
III - 3 rd the rest of the ICU has to be cleaned starting from the entrance and proceeding in a clockwise manner (as shown in picture 1 with pink coloured arrows).

IV - 4 th the doffing area has to be cleaned, as it is the dirtiest area of the entire ICU.

Doffing area:

- Full size mirror should be present on the wall to check for the proper doffing procedure.
- Designated closed bin and bag for discarding PPE has to be placed.
- Hand rub stand with hand rub has to be fixed.
- Stand to be fixed on the wall for glove box
- Doffing poster has to be present to check for the correct doffing sequence.
- Hand hygiene poster to be placed on wall

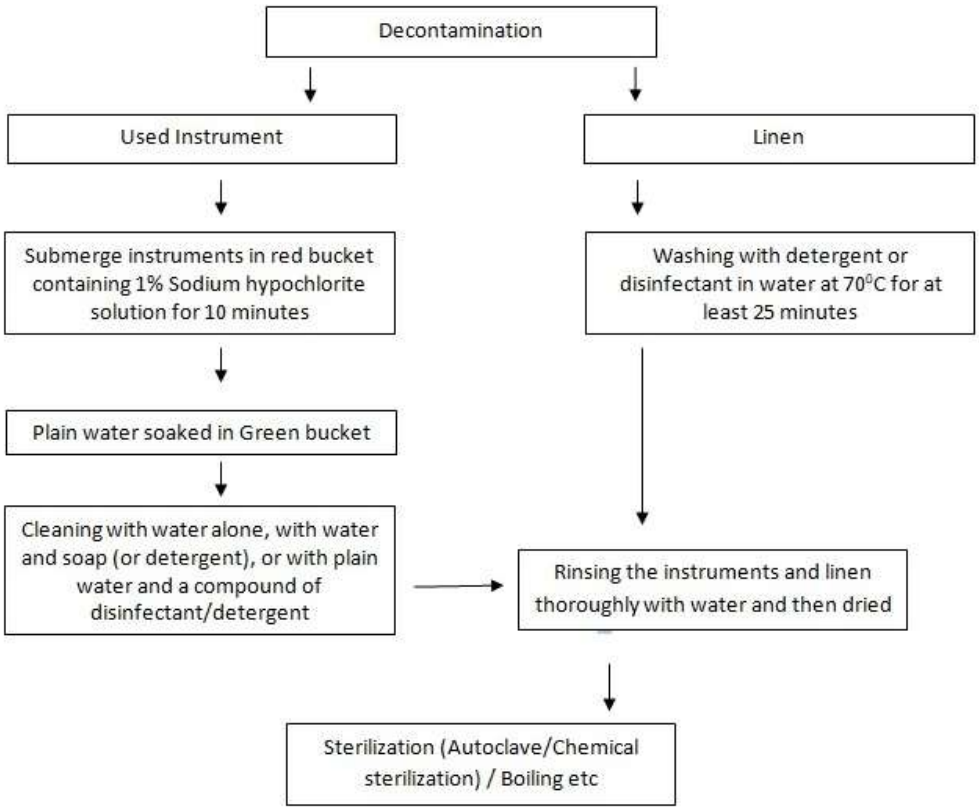
Cleaning protocol in patient isolation room with single bed:



Patient room has to be cleaned in the above mentioned pink coloured arrows, starting from the door and following a clockwise manner. The washroom has to be cleaned last.

High Frequency cleaning area

4.9 Equipment sterilization/decontamination procedure



4.10 Implementing engineering controls

Environmental and engineering controls are an integral part of IPC and include standards for adequate ventilation according to specific areas in health-care facilities, adapted structural design, spatial separation, as well as adequate environmental cleaning. Environmental and engineering controls play a key role in aiming to reduce the concentration of infectious respiratory aerosols (i.e. droplet nuclei) in the air and the contamination of surfaces and inanimate objects. Such controls are particularly important in the context of SARS-CoV-2, a novel virus with a high public health impact, which spreads primarily via respiratory droplets that may aerosolized under certain conditions such as AGPs.

Ventilation rates within defined spaces in health-care facilities are generally addressed by national regulations. In health-care facilities, large quantities of fresh and clean outdoor air are required both for the benefit of their occupants and the control of contaminants and odors by dilution and removal. There are three basic criteria for the ventilation:

1. ventilation rate: the amount and quality of outdoor air provided into the space;
2. airflow direction: the overall airflow direction in a building and between spaces should be from clean to less clean zones; and
3. air distribution or airflow pattern: the supply of air that should be delivered to each part of the space to improve dilution and removal of airborne pollutants generated in the space.

There are three methods that may be used to ventilate spaces within health-care facilities: natural, mechanical and hybrid (mixed-mode) ventilation.

Each ventilation system has its advantages and disadvantages, as described in WHO's manual on severe acute respiratory treatment centres. For details see that document.

5.Implementing administrative controls

Hospital administration is responsible for ensuring IPC practices mentioned in this guideline to contain COVID-19 infection in hospital settings. 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 healthcare 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.

5.1. Administrative measures related to health workers (Included from WHO guideline)

These measures include:

- provision of adequate training for health workers;
- ensuring an adequate patient-to-staff ratio;
- establishing an active syndromic surveillance of health workers at the facility entrance when they arrive at work
- ensuring that health workers and the public understand the importance of seeking medical care
- promptly
- monitoring health workers' compliance with standard precautions and providing mechanisms for
- improvement as needed**.**

5.2. Administrative measures to manage visitors (Included from WHO guideline)

- Ideally all health-care facilities in areas with COVID-19 community transmission should implement policies to restrict visitor access. This measure aims not only to protect visitors from getting infected, but also to reduce visitors' potential to introduce the COVID-19 virus into the health-care facilities. Health-care facilities should:
- identify alternatives for direct interaction between patients, family members, other visitors and clinical
- staff, including making remote communications available (e.g. telephone, internet connection);
- restrict entry to visitors who are essential such as the parents of pediatric patients and caregivers;
- encourage family members to assign a single caregiver to the patient. These caregivers should not
- be people who are at high risk for severe COVID-19, such as older people or people with underlying
- medical conditions;
- designate an entrance that visitors who are caregivers can use to access the health-care facility;
- maintain a record of all visitors allowed in the
- Facility
- educate caregiver visitors on hand hygiene, respiratory etiquette, physical distancing and other
- standard precautions, and how to recognize the signs and symptoms of COVID-19;
- train and supervise caregiver visitors of patients with suspected or confirmed COVID-19 patients on
- the use of required PPE (i.e. droplet and contact precaution)
- caregiver visitors in areas with community transmission, including those caring for patients
- without suspected or confirmed COVID-19, should wear a medical mask in clinical areas to prevent
- transmission
- restrict movement of the visitor within the healthcare facility
- conduct active screening of all caregiver visitors before entering the facility in areas with widespread
- community transmission;
- prohibit visitors' presence during AGPs;
- reduce traffic to the health-care facility: consider relocating outpatient pharmacy or other services to a
- location outside of the main health-care facility.

5.3. The Hospital Infection Prevention Committee

The hospital IPC committee provides a forum for multidisciplinary input, cooperation, and information sharing. This committee should include wide representation from relevant departments. This will work under the Hospital quality improvement committee (QIC).

Modifications can be made based on local needs and type of hospital.

National IPC Committee

A national IPC committee should be formed with relevant departments of DGHS (Disease control section, Hospital section, CBHC), IEDCR, NIPSOM, IPH, Development partners and specialists from different organizations like microbiologists, virologists, infectious diseases specialists.

The National IPC committee has the following responsibilities

- Develop and approve the national guideline and tools on IPC, and review them as and when necessary
- Review and recommend IPC policies to the government for adaptation
- Support the facility level IPC committees and facilitate allocation of resources (fund, supplies etc.) to address the problems at the health facilities
- Develop capacity of the health facility staff for IPC
- Review the surveillance data, identify the problems, and areas of interventions
- Coordinate and monitor the IPC situation of the health facilities across the country
- Communicate and cooperate with other departments with common interests, such as QIS, Hospital and Clinics section, Waste management, etc.
- Provide necessary technical support to outbreak investigations

IPC Committee for different level of Hospital/ Facility

The IPC committee should be formed in every health care setting. Following format should be used.

Medical College Hospital

Chairperson: Director, Medical College Hospital

Co-Chairperson: Principal, Medical College

Member Secretary: Microbiology/ Virology (Department Head/ Associate Professor/Assistant Professor)/ Deputy Director/ Assistant Director/ Resident Physician/ Resident Surgeon

Members: One representative from each department (Professor), Nursing Superintendent/ Ward Master

Focal Person/ Co-ordinator: Microbiologist/ Virologist/ Assistant Professor

Specialized Hospital

Chairperson: Director, Specialized Hospital

Co-Chairperson: Deputy Director

Member Secretary: Microbiology/ Virology (Department Head/ Associate Professor/Assistant Professor)/ Assistant Director/ Resident Physician/ Resident Surgeon

Members: One representative from each department (Professor), Nursing Superintendent and Ward Master

Focal Person/ Co-ordinator: Microbiologist/ Virologist/ Assistant Professor

District Hospital

Chairperson: Hospital Superintendent

Member Secretary: Resident Medical Officer (RMO)

Members: One representative from each department (Consultant), Nursing Superintendent/Matron and Ward Master

Upazila Health Complex

Chairperson: Upazila and Family Planning Officer (HFPO)

Member Secretary: Resident Medical Officer (RMO)

Members: One representative from each department (Consultant), Nursing Superintendent/Matron and Ward Master

Private Hospital/ Clinics

Chairperson: Director

Co-Chairperson: Deputy Director

Member Secretary: Microbiology/ Virology (Department Head/ Associate Professor/Assistant Professor)/ Assistant Director/ Resident Physician/ Resident Surgeon

Members: One representative from each department (Professor), Nursing Superintendent and Ward Master

Focal Person/ Co-ordinator: Resident Medical Officer (RMO)

The IPC Committee for different level of Hospital has the following responsibilities

- Developing an IPC work plan and implementing it within the hospital.
- Introduce infection register and establish infection surveillance, regularly review data, and take necessary measures

- Coordinating and conducting training activities, including staff training
- Providing/advocating for sufficient resources to support the IPC program
- Monitoring infection prevention practices and applying measures to close gaps between set standards and actual practices (e.g., Hand hygiene, appropriate use of PPE, isolation, sterilization of equipment, waste management, etc.)
- Collecting data to measure indicators reflecting extent of infections acquired in the Health facility (e.g. COVID infection rate among the hospital staff, postoperative infection rate)
- Developing and disseminating infection control policies for the hospital.
- The committee will meet together once every month to review the IPC situation of the hospital and take necessary actions.
- The Member secretary will arrange the monthly IPC committee meeting.

IPC Team

There will be one or more IPC teams in a hospital or in a health complex. The team will work dedicatedly for the hospital and the team will form with:

1. Medical Officer (Facilitator from the existing Work Improvement Team)
2. Senior Staff Nurse (Member from existing Work Improvement Team)

Responsibility of the IPC Team:

- The IPC team at different sections of the hospital will implement the action plan as developed by the IPC committee
- The teams will coordinate with the IPC committee for necessary logistic and technical supports as and when required
- The team will introduce the infection register in the section, and record all the information
- The team will monitor and report the progress of implementation of the action plan and the IPC situation of the section to the IPC committee periodically (weekly)
- The team will meet every week/fortnightly to discuss the IPC situation of the section and take necessary measures to improve the situation

5.4 IPC Monitoring Team:

There will be a monitoring team in every district to monitor the IPC status of the hospitals and provide necessary advice. The team formation can vary from district to district.

The IPC monitoring teams of the districts where there are government medical colleges will be formed as follows:

1. Professor / Associate Professor / Assistant Professor (Microbiology / Virology) - President

2. 1 Associate Professor / Assistant Professor / Consultant (Medicine) - Member

3. 1 Associate Professor / Assistant Professor / Consultant (Anesthesiology) - Member

4. Deputy Civil Surgeon / Medical Officer Civil Surgeon or Civil Surgeon Designated Officer - Member Secretary

In districts where there is no government medical college, the IPC monitoring team will be formed as follows:

1. Medicine Consultant - President

2. 1 Anesthesiologist - Member

3. Deputy Civil Surgeon / Medical Officer Civil Surgeon or Civil Surgeon Designated Officer - Member Secretary

Responsibilities of IPC monitoring team:

- The Monitoring Team (Monitoring Team) is responsible for inspecting all government and private hospitals, health institutions and clinics in the district for prevention and control activities. During the outbreak of COVID19, they will conduct monitoring activities in the hospital where the patients are treated.
- They will visit the COVID dedicated hospital at least once a month and conduct monitoring activities in accordance with national IPC guidelines and monitoring checklists sent by the Department of Health and provide advice on improving hospital infection prevention and control activities.
- The Monitoring Team (Monitoring Team) will be able to meet with the Hospital Infection Prevention and Control Committee and provide necessary guidance.
- The Monitoring Team will send their report through the Civil Surgeon to the Disease Control Branch of the Department of Health on a regular basis (within 3 working days of monitoring).

Annex:

Directorate General of Health Services

Communicable Disease Control Section

IPC Assessment Checklist

Date of assessment: _____

Name of the Hospital: _____

Name , Designation and Mobile # of Hospital Manager :

Name and Designation of the Assessor:

1. **_____**
2. **_____**
3. **_____**

1. Basic information about the hospital:

1. Type of the hospital:	1. Public 2. Private	3. Others
2. Is it a COVID-19 designated hospital?	1. Yes	2. No
3. If no, does it admit COVID patients?	1. Yes	2. No
4. No. of hospital beds	_____	
5. Number of beds designated for COVID 19 patients	_____	
6. Is ICU present?	1. Yes	2. No
7. No. of beds in ICU	_____	

8. HR Training Status

Category	**Total Number**	**# Trained on IPC by DGHS**
Doctor (Consultants, Manager, MO)		
Nurse/Midwives		
Cleaner		
Driver		

2. Facility assessment (information may be collected through observation, interviewing the key staff, or through record review)

Sl	Situation	Status	Means of verification
1	**IPC structure:**		
1.1	Is the IPC committee formed as per guideline?	Yes / No	KII/ Record review
1.2	Is there IPC teams at different wards/ units as per guideline?	Yes / No	KII/ Record review
1.3	Is there any action plan developed by the IPC committee to improve/maintain IPC at the hospital?	Yes / No	Record review
1.4	Does the committee regularly monitor the IPC situation using a checklist according to guideline?	Monthly/Weekly/ No	Record review
1.5	Is there a dedicated IPC office and dedicated IPC nurses	Yes/No	Observation and record review
1.6	Is there a healthcare associated infection register at the relevant sections/ wards (medicine, surgery, OG, pediatric wards and SCANU, etc.)?	Yes/No	Observation (availability of register)
1.7	Is the infection register maintained properly?	Yes / No	Observation
1.8	Is there a national IPC guideline at the hospital? (available at the QIS website: www.qis.gov.bd)	Yes / No	Observation (availability of guideline)
1.9	Is there COVID IPC guideline at the hospital? (available at the DGHS website)	Yes / No	Observation (availability of guideline)
2	**Treatment facilities:**		
2.1	Is there any triage/fever corner in the hospital outdoor/emergency	Yes / No	Observation

2.2	Does the hospital have separate emergency services for COVID and non-COVID patients?	Yes / No	Observation
2.2	If yes, is the COVID emergency marked red?	Yes / No	Observation
2.3	Is there a separate ward for COVID patients and marked red?	Yes / No	Observation
2.4	Is there an isolation facility at the hospital and marked ?	Yes / No	Observation
2.5	Does the hospital maintain safe distance from patients' beds (beds are set at least 2 meters apart)?	Yes / No	Observation
2.6	Is there a separate ICU for COVID patients and marked red?	Yes / No	Observation
2.7	Is there separate OT for COVID patients and marked red?	Yes / No	Observation
2.8	Is the OT disinfected after the operation of each COVID patient?	Yes / No	KII
2.9	Is there a separate post-operative ward for COVID patients and marked red?	Yes / No	Observation
2.10	Are the dialysis machines separated for COVID and non-COVID patients (if there is a dialysis facility at the hospital)?	Yes / No	Observation / KII
3	**Compliance to National IPC Protocol**		
3.1	Does the hospital practice triage at emergency?	Yes / No	KII and observation
3.2	Does the hospital practice triage at OPD?	Yes / No	Observation & KII
3.3	Are there hand hygiene (running water, basin, soap, etc.) facilities at all points of care?	Yes / No	Observation
3.4	Is there hand hygiene poster at the hand washing sites?	Yes / No	Observation

3.5	Is there space for donning and doffing at the relevant areas?	Yes / No	Observation
3.6	Is there flow chart of donning and doffing in the donning and doffing areas?	Yes / No	Observation
3.8	Does the hospital provide masks to the patients?	Yes / No	KII
3.9	Is there a visitor control policy at the hospital during the pandemic situation?	Yes / No	Record review / KII
3.10	Are there hand hygiene facilities for the visitors?	Yes / No	Observation
3.12	How frequently do you orient the staff on IPC?	Yes / No	KII
3.14	How frequently is the floor cleaned?	8 hourly /12 hourly/ daily/	KII / record review (cleaning schedule)
3.15	Are there adequate covered waste collection bins at the COVID and other relevant areas?	Yes / No	Observation
3.16	Does the hospital dispose of hospital waste as per national guideline?	Yes / No	KII
3.18	Does the hospital sterilize equipment either through autoclave or high-level disinfection (boiling)?	Yes / No	Observation/ KII
4	**Logistics:**		
4.1	Does the hospital have sufficient PPE?	Yes / No	KII and observation (staff wearing PPE)
4.2	Does the hospital have sufficient masks for the patients?	Yes / No	KII
4.4	Does the hospital have sufficient logistics for hand hygiene (soap, running water, hand sanitizer etc.)	Yes / No	KII

4.5	Does the hospital have sufficient cleaning materials, such as detergent, mops, and buckets, etc.?	Yes / No	KII
4.6	Does the hospital have sufficient waste bins? (at least 3 colors)	Yes / No	KII/ Observation
4.7	Does the hospital have adequate no. of functioning autoclaves?	Yes / No	KII/ Observation
4.8	Does the hospital have adequate no. of functioning electric sterilizer?	Yes / No	KII/ Observation
5	**Patient discharge and disposal of dead bodies:**		
5.2	Does the hospital counsel patients for home isolation (after discharge of COVID patients)?	Yes / No	KII / Exit interview of patient (if possible)
5.3	Does the hospital follow the guideline to dispose of the dead bodies?	Yes / No	KII

3. Overall impression:

Facility/Process	Inadequate	Basic	Adequate	Advanced	Further comment
Isolation area					
Triage Areas					
Hospital cleaning process					
Donning					
Doffing					
Type of PPE					
Waste management					
Laundry management					
Cleaning of utensils					

Annex2. Recommendations:

Table: **Recommendations for application of Standard Precautions for the care of all patients in all healthcare settings**

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
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

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