



Guidelines and protocols for Prevention and Control of Novel Corona Virus (COVID-19)



Department of Health & Family Welfare
Government of Haryana

Purpose and scope of document

This document is intended for healthcare service providers including clinicians, staff nurses and laboratory technicians involved in management of patients with severe acute respiratory infection (SARI) when a COVID-19 infection is suspected. It is not meant to replace clinical judgment or specialist consultation but rather to strengthen clinical management of these patients and provide to up-to-date guidance. Implementation of best practices in severe acute respiratory infection including infection prevention and control activities and optimized supportive care for severely ill patients is essential.

This document aims to provide healthcare service providers with updated interim guidance and protocols on timely, effective, and safe supportive management of patients with nCoV and SARI, particularly those with critical illness. The recommendations in this document are derived from GoI guidance and WHO publications.

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i. Introduction

Coronaviruses belong to a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats, bats etc. Rarely, animal corona viruses may evolve and infect people and then spread between people as witnessed during the outbreak of Severe Acute Respiratory Syndrome (SARS, 2003) and Middle East Respiratory Syndrome (MERS, 2014).

The etiologic agent responsible for current outbreak of SARS-CoV-2 is a novel coronavirus and is closely related to SARS-Coronavirus. In humans, the transmission of SARS-CoV-2 can occur via respiratory secretions (directly through droplets from coughing or sneezing, or indirectly through contaminated objects or surfaces as well as close contacts). Nosocomial transmission has been described as an important driver in the epidemiology of SARS and MERS and has also been documented in COVID-19.

Current estimates of the incubation period of COVID range from 2-14 days, and these estimates will be refined as more data become available. Most common symptoms include fever, fatigue, dry cough and breathing difficulty. Upper respiratory tract symptoms like sore throat, rhinorrhea, and gastrointestinal symptoms like diarrhea and nausea/vomiting are seen in about 20% of cases.

Due to paucity of scientific literature based on community based studies, the available data on host factors is skewed towards cases requiring hospitalization. As per analysis of the biggest cohort reported by Chinese CDC, about 81% of the cases are mild, 14% require hospitalization and 5% require ventilator and critical care management. The deaths reported are mainly among elderly population particularly those with co-morbidities. At the time of writing this document, many of the crucial epidemiological information particularly source of infection, mode of transmission, period of infectivity are still under investigation.



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Chapter 01: Protocol for hospitals with suspected/confirmed case

1. Principles of infection prevention and control strategies associated with health care with suspected nCoV, to prevent or limit infection transmission in health-care settings include the following:
 - a. Early recognition and source control
 - b. Application of Standard Precautions for all patients
 - c. Implementation of empiric additional precautions (droplet and contact and whenever applicable airborne precautions) for suspected cases
 - d. Administrative controls
 - e. Environmental and engineering controls
2. Early recognition and source control
 - a. Clinical triage including early recognition and immediate placement of patients in separate area from other patients (source control) is an essential measure for rapid identification and appropriate isolation and care of patients with suspected nCoV infection
 - b. To facilitate early identification of suspect cases, healthcare facilities should:
 - i. Encourage staff to have a high level of clinical suspicion
 - ii. Institute screening questionnaire and
 - iii. Post signage in public areas reminding symptomatic patients to alert staff
 - c. Promotion of respiratory hygiene is an important preventative measure
 - d. Suspected nCoV patients should be placed in an area separate from other patients, and additional IPC (droplet and contact) precautions promptly implemented
3. Application of Standard Precautions for all patients
 - a. Standard Precautions include hand and respiratory hygiene; use of Personal protective equipment (PPE) depending on risk; prevention of needle-stick or sharps injury; safe waste management; environmental cleaning and sterilization of patient-care equipment and linen
 - b. Ensure the following respiratory hygiene measures:

- i. Offer a medical mask for suspected nCoV infection for those who can tolerate it
 - ii. Cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others
 - iii. Perform hand hygiene after contact with respiratory secretions
 - c. Personal protective equipment (PPE)-
 - i. Rational, correct, and consistent use of available PPE and appropriate hand hygiene also helps to reduce the spread of the pathogens
 - ii. PPE effectiveness depends on adequate and regular supplies, adequate staff training, proper hand hygiene and specifically appropriate human behavior
 - d. Ensure that environmental cleaning and disinfection procedures are followed consistently and correctly
 - e. Thorough cleaning of environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure
 - f. Manage laundry, food service utensils and medical waste in accordance with safe routine procedures
- 4. Implementation of additional precautions for suspected nCoV infections
 - a. Contact and Droplet precautions for suspected nCoV infection:
 - i. In addition to Standard Precautions, all individuals, including family members, visitors and HCWs should apply Contact and Droplet precautions
 - ii. Place patients in adequately ventilated single rooms. For naturally ventilated general ward rooms this is considered to be 160 L/second/patient
 - iii. When single rooms are not available, place cohort patients suspected of nCoV infection together
 - iv. Place patient beds at least 1m apart
 - v. Where possible, staff to exclusively care for cases to reduce the risk of spreading transmission due to inadvertent infection control breaches
 - vi. Use a medical mask
 - vii. Use eye/facial protection (i.e. goggles or a face shield)
 - viii. Use a clean, non-sterile, long-sleeved fluid resistant gown
 - ix. Use gloves
 - x. Use either single use disposable equipment or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use (e.g. ethyl alcohol 70%)
 - xi. Refrain from touching eyes, nose or mouth with potentially

contaminated hands

- xii. Avoid the movement and transport of patients out of the room or area unless medically necessary. Use designated portable X-ray equipment and/or other important diagnostic equipment. If transport is required, use pre-determined transport routes to minimize exposures to staff, other patients and visitors and apply medical mask to patient
 - xiii. Ensure that HCWs who are transporting patients wear appropriate PPE as described in this section and perform hand hygiene
 - xiv. Notify the receiving area of necessary precautions as soon as possible before the patient's arrival
 - xv. Routinely clean and disinfect patient-contact surfaces
 - xvi. Limit the number of HCWs, family members and visitors in contact with a patient with suspected nCoV infection
 - xvii. Maintain a record of all persons entering the patient's room including all staff and visitors
- b. Airborne precautions for aerosol-generating procedures for suspected nCoV infection:
- i. Some aerosol generating procedures have been associated with increased risk of transmission of such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation and bronchoscopy
 - ii. Ensure that HCWs performing aerosol-generating procedures:
 - a) Use a particulate respirator at least as protective as a NIOSH-certified N95, EU FFP2 or equivalent
 - b) While putting on a disposable particulate respirator, always perform the seal-check
 - c) Note that if the wearer has facial hair (beard) this can prevent a proper respirator fit
 - d) Eye protection (i.e. goggles or a face shield)
 - e) Clean, non-sterile, long-sleeved gown and gloves
 - f) If gowns are not fluid resistant, use a waterproof apron for procedures with expected high fluid volumes that might penetrate the gown
 - g) Perform procedures in an adequately ventilated room; i.e. at least natural ventilation with at least 160 l/s/patient air flow or negative pressure rooms with at least 12 air changes per hour and controlled direction of air flow when using mechanical ventilation
 - h) Limit the number of persons present in the room to the absolute minimum required for the patient's care and support
- c. Administrative controls

- i. Administrative controls and policies that apply to prevention and control of transmission of nCoV infections include establishment of sustainable infection prevention and control infrastructure and activities
 - ii. Staff training
 - iii. Education of patients' care givers
 - iv. Policies on early recognition of acute respiratory infection potentially due to nCoV, access to prompt laboratory testing for identification of the etiologic agent; prevention of overcrowding especially in the emergency department
 - v. Provision of dedicated waiting areas for symptomatic patients and appropriate placement of hospitalized patients promoting an adequate patient-to-staff ratio; provision and use of regular supplies
 - vi. IPC policies and procedures for all facets of healthcare provisions
 - vii. Emphasis on surveillance of acute respiratory infection potentially due to nCoV among staff and the importance of seeking medical care; and monitoring of staff compliance, along with mechanisms for improvement as needed
 - d. Environmental and engineering controls
 - i. These controls address ensuring adequate environmental ventilation in all areas within a health-care facility, as well as adequate environmental cleaning
 - ii. Spatial separation of at least 1-meter distance should be maintained between each suspect patient and others
 - iii. Both controls can help reduce the spread of many pathogens during health care
- 5. Duration of contact and droplet precautions for nCoV infection
 - a. Standard precautions should always be applied at all times. Additional contact and droplet precautions should continue until the patient is asymptomatic
 - b. More comprehensive information on the nCoV infection mode of transmission is required to define duration of additional precautions
- 6. Collection and handling of laboratory specimens from patients with suspected nCoV
 - a. All specimens collected for laboratory investigations should be regarded as potentially infectious, and staff who collect, or transport clinical specimens should adhere rigorously to standard precautions to minimize the possibility of exposure
 - i. Ensure that HCWs who collect specimens use appropriate PPE (eye protection, medical masks, long-sleeved gown, and gloves)
 - ii. If the specimen is collected under aerosol generating procedure, personnel should wear a particulate respirator at least as protective as a NIOSH-certified

N95, EU FFP2 or equivalent

- iii. Ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures
- iv. Place specimens for transport in leak-proof specimen bags (secondary container) that have a separate sealable pocket for the specimen (i.e. a plastic biohazard specimen bag), with the patient's label on the specimen container (primary container), and a clearly written laboratory request form
- v. Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled
- vi. Deliver all specimens by hand whenever possible. DO NOT use pneumatic-tube systems to transport specimens.

Document patient's full name, date of birth of suspected nCoV of potential concern clearly on the accompanying laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported

7. Sample collection, storage and transportation

- a. Collection and handling of laboratory specimens from patients with suspected 2019 nCoV- Acute Respiratory Disease
- b. All specimens collected for laboratory investigations should be regarded as potentially infectious, and persons who collect, or transport clinical specimens should adhere rigorously to Standard Precautions to minimize the possibility of exposure to pathogens
- c. Ensure that staff who collect specimens use appropriate PPE (eye protection, medical mask, long-sleeved gown, gloves)
- d. If the specimen is collected under aerosol generating procedure, personnel should wear a particulate respirator at least as protective as a NIOSH-certified N95, EU FFP2 or equivalent
- e. Ensure that all personnel who transport specimens are trained in safe handling practices and spill management procedures

8. Samples to be collected

- a. Nasopharyngeal swab / Nasal Swabs – 2
- b. Throat swab
- c. Before collecting the samples, it requires to be ensured that neck is in extended position
- d. Nasopharyngeal swab will be collected with the per nasal swab provided in the kit, after taking out the swab it is passed along the floor of nasal cavity and left there for about five second and transferred into Viral Transport Medium, VTM and transported to the designated lab at 4 degree Celsius as soon as possible (same day)
- e. For collection of samples from throat area the other sterilized swab is swabbed over the tonsillar area and posterior pharyngeal wall and finally transferred into

VTM and stored and transported to the designated lab at 4 degree Celsius as soon as possible (same day)

- f. Other respiratory material like endotracheal aspirated/broncho-alveolar lavage in patients with more severe respiratory disease can also be collected and transported in the same way
- g. Place specimens for transport in leak-proof specimen bags /Zip lock pouch (secondary container) with the patient's label on the specimen container (primary container), and a clearly written laboratory request form
- h. Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled. Deliver all specimens by hand whenever possible
- i. Document patient's full name, age / date of birth of suspected 2019-nCoV case of potential concern clearly on the accompanying laboratory request form
- j. Notify the laboratory as soon as possible that the specimen is being transported

9. Bio Medical Waste Management from suspected case of nCoV

- a. Refer to protocol on BMW management
- b. All articles like swab, PPEs are to be discarded in yellow bag
- c. All sharps like needles should be discarded in white puncture proof containers

10. Laundry

- a. All soiled clothing bedding and linen should be gathered without creating much motion/fluffing
- b. Do not shake sheets when removing them from the bed
- c. Always perform hand hygiene after handling soiled laundry items
- d. Soiled linen should be disinfected in freshly prepared 1% bleach for a minimum of 20 minutes and then transported to laundry in tightly sealed and labeled plastic bag

11. Monitor health of staff providing care to cases

- a. HCWs and housekeeping staff providing care to cases of 2019-nCoV acute respiratory diseases cases shall be monitored daily for development of any symptoms as per the suspect case definition including charting of their temperature twice daily for 14 days after last exposure
- b. If they develop any symptoms then standard protocol laid down for management of suspect case of 2019-nCoV acute respiratory disease shall be followed

12. Hospital Disinfection (Environmental)

- a. Environmental surfaces or objects contaminated with blood, other body fluids, secretions or excretions should be cleaned and disinfected using standard hospital detergents/disinfectants e.g. freshly prepared 1% Sodium Hypochlorite or 5% Lysol. Spray the surface with 0.5% to 1% solution of Sodium Hypochlorite solutions

- b. The contact period of the chemical with the surface should be min. of 20 minutes
- c. Disinfect all external surfaces of specimen containers thoroughly (using an effective disinfectant) prior to transport. E.g. Sodium hypochlorite at 1%, 500 ppm available chlorine (i.e. 1:100 dilution of household bleach at initial concentration of 5%) or 5% Lysol
- d. Environmental surfaces or objects contaminated with blood, other body fluids, secretions or excretions should be cleaned and disinfected using standard hospital detergents/disinfectants e.g. freshly prepared 1% Sodium Hypochlorite or 5% Lysol
- e. Do not spray (i.e. fog) occupied or unoccupied clinical areas with disinfectant. This is a potentially dangerous practice that has no proven disease control benefit
- f. Wear gloves, gown, mask and closed shoes (e.g. boots) when cleaning the environment and handling infectious waste. Cleaning heavily soiled surfaces (e.g. soiled with vomit or blood) increases the risk of splashes
- g. On these occasions, facial protection should be worn in addition to gloves, gown and closed, resistant shoes. Wear gloves, gown, closed shoes and goggles/facial protection, when handling liquid infectious waste (e.g. any secretion or excretion with visible blood even if it originated from a normally sterile body cavity). Avoid splashing when disposing of liquid infectious waste
- h. Clean and disinfect mattress impermeable covers
- i. Non-critical instruments /equipment (that are those in contact with intact skin and no contact with mucous membrane) require only intermediate or low level disinfection before and after use

13. Liquid Spill Management

- a. Promptly clean and decontaminate spills of blood and other potentially infectious materials
- b. Wear protective gloves
- c. 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
- d. Cover spills of infected or potentially infected material on the floor with paper towel/ blotting paper/newspaper. Pour 0.5% freshly prepared sodium hypochlorite
- e. Leave for 20 minutes for contact
- f. Place all soiled absorbent material and contaminated swabs in a yellow linen & container
- g. Then clean the area with gauze or mop with water and detergent with gloved



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Chapter 02: Protocol on Use of Personal Protective Equipment (PPE)

1. Personal protective equipment (PPE) is specialized clothing or equipment, worn by an employee for protection against infectious materials
2. All of the PPE listed here prevent contact with the infectious agent, or body fluid that may contain the infectious agent, by creating a barrier between the worker and the infectious material
3. Components of PPEs – glove, gown/apron, mask, respirators, goggles, face shields and shoes
4. Gloves protect the hands, gowns or aprons protect the skin and/or clothing, masks and respirators protect the mouth and nose, goggles protect the eyes, and face shields protect the entire face and shoes to protect feet. The respirator has been designed to protect the respiratory tract from airborne transmission of infectious agents
5. Gloves protect you against contact with infectious materials. However, once contaminated, gloves can become a means for spreading infectious materials to yourself, other patients or environmental surfaces. Therefore, the way gloves are used can influence the risk of disease transmission
6. **Do's and Don'ts of Glove Use**
 - a. Work from “clean to dirty”: It refers to touching clean body sites or surfaces before you touch dirty or heavily contaminated areas
 - b. Limit opportunities for “touch contamination” - protect yourself, others, and the environment
 - i. Don't touch your face or adjust PPE with contaminated gloves
 - ii. Don't touch environmental surfaces except as necessary during patient care
 - c. Change gloves
 - i. During use if torn and when heavily soiled (even during use on the same patient)

- ii. After use on each patient
- d. Discard in appropriate receptacle
 - i. Never wash or reuse disposable glove

7. Sequence for Donning PPE

(Gown → mask/respirator → goggles → gloves)

1. The gown should be donned first
2. The mask or respirator should be put on next and properly adjusted to fit; remember to fit check the respirator
3. The goggles or face shield should be donned next
4. The gloves are donned last

7.1 How to don a Gown

- a. Select appropriate type and size
- b. Opening is in the back
- c. Secure at neck and waist
- d. If gown is too small, use two gowns
- e. Gown #1 ties in front
- f. Gown #2 ties in back



7.2 How to don a Mask

- a. Place over nose, mouth and chin
- b. Fit flexible nose piece over nose bridge
- c. Secure on head with ties or elastic
- d. Adjust to fit



7.3 How to don a Particulate Respirator

- a. Select a fit tested respirator
- b. Place over nose, mouth and chin
- c. Fit flexible nose piece over nose bridge
- d. Secure on head with elastic
- e. Adjust to fit
- f. Perform a fit check –
 - i. Inhale – respirator should collapse
 - ii. Exhale – check for leakage around face



7.4 How to don Eye and Face Protection

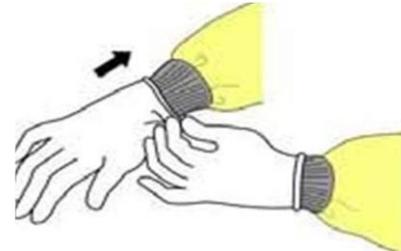
- a. Position goggles over eyes and secure to the head using the ear pieces or headband



- b. Position face shield over face and secure on brow with headband
- c. Adjust to fit comfortably

7.5 How to don Gloves

- a. Don gloves last
- b. Select correct type and size
- c. Insert hands into gloves
- d. Extend gloves over isolation gown cuffs



8 Sequence for Removing PPE

- 1. Gloves
- 2. Face shield or goggles
- 3. Gown
- 4. Mask or respirator

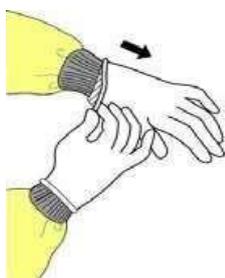
9 Where to remove PPE

- a. At doorway, before leaving patient room
- b. Remove respirator outside room, after door has been closed*
- c. Ensure that hand hygiene facilities are available at the point needed, e.g., sink or alcohol-based hand rub

10 Doffing/ Removing PPE

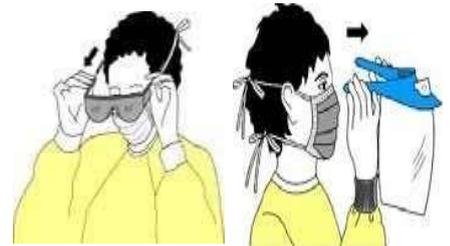
10.1 How to Remove gloves

- a. Using one gloved hand, grasp the outside of the opposite glove near the wrist
- b. Pull and peel the glove away from the hand
- c. The glove should now be turned inside-out, with the contaminated side now on the inside
- d. Hold the removed glove in the opposite gloved hand
- e. Slide ungloved finger under the wrist of the remaining glove
- f. Peel off from inside, creating a bag for both gloves
- g. Discard



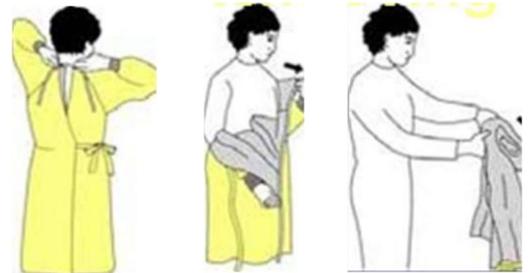
10.2 Remove goggles or face shield

- a. Using ungloved hands, grasp the “clean” ear or head pieces and lift away from face
- b. If goggle or face shield are reusable, place them in a designated receptacle for subsequent reprocessing
- c. Otherwise, discard them in the waste receptacle



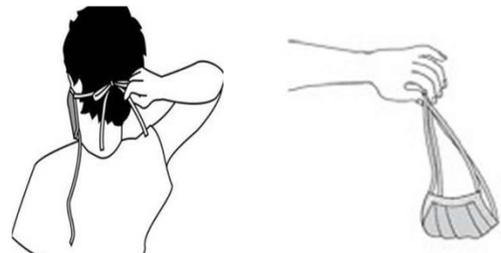
10.3 Removing isolation gown

- a. Unfasten ties
- b. Peel gown away from neck and shoulder
- c. Turn contaminated outside toward the inside
- d. Fold or roll into a bundle
- e. Discard



10.4 Removing a mask

- a. Untie the bottom and then top
- b. Remove from face
- c. Discard



10.5 Removing a particulate respirator

- a. Lift the bottom elastic over your head first
- b. Then lift off the top elastic
- c. Discard

11 Hand Hygiene

- a. Perform hand hygiene immediately after removing PPE.
- b. If hands become visibly contaminated during PPE removal, wash hands before continuing to remove PPE
- c. Wash hands with soap and water or use an alcohol-based hand rub
- d. Ensure that hand hygiene facilities are available at the point needed, e.g., sink or alcohol-based



Chapter 03: Protocol for Isolation Ward

1. Isolation (patient placement)

- a. Any possible case should be managed in **negative pressure** single room if available. If this is not possible, then a single room with attached toilet facilities should be used. Room doors should be kept closed.
- b. The nature of the area adjoining the side room should be taken in to account to minimize the risk of inadvertent exposure (such as high footfall areas, vulnerable and high-risk patient groups).
- c. If in a critical care unit, the patient should be nursed in a negative-pressure single or side room where available, or, if not available, a neutral-pressure side room with the door closed.
- d. If there is no attached toilet, a dedicated commode (which should be cleaned as per local cleaning schedule) should be used with arrangements in place for the safe removal of the bedpan to an appropriate disposal point.
- e. Avoid storing any extraneous equipment in the patient's room
- f. Display signage to control entry into the isolation room

2. Anterooms and putting on and removing PPE

- a. Anterooms (otherwise known as 'lobbies') also have the potential to become contaminated and should be regularly decontaminated as described in environmental decontamination.
- b. It is strongly advised that staff progress through 'dirty' to 'clean' areas within the anteroom as they remove their PPE and wash hands after they leave the patient room. To this effect, movements within the anteroom should be carefully monitored and any unnecessary equipment should not be kept in this space.
- c. In the event that no anteroom or lobby exists for the single room used for COVID-19 patients, then local infection (prevention and) control teams will need to consider alternative ways of accommodating these recommendations to suit local circumstances.

3. Notices about infection risks

- a. Written information must be placed on the isolation room door indicating the need for isolation, including the infection prevention and control precautions which must be adhered to prior to entering the room.
- b. Patient confidentiality must be maintained.

4. Entry records

- a. Only essential staff should enter the isolation room.
- b. A record should be kept of all staff in contact with a possible case, and this record should be accessible to occupational health should the need arise.

5. Visitors

- a. Visitors should be restricted to essential visitors only, such as parents of a pediatric patient or an affected patient's main care taker.
- b. Visitors should be permitted only after completion of a local risk assessment which includes safeguarding criteria as well as the infection risks.
- c. The risk assessment must assess the risk of onward infection from the visitor to healthcare staff, or from the patient to the visitors. The risk assessment should include whether it is feasible for the visitor to learn correct usage of PPE (donning and doffing under supervision), and should determine whether a visitor, even if asymptomatic, may themselves be a potential infection risk when entering or exiting the unit. It must be clear, documented and reviewed.
- d. If correct use of PPE cannot be established, then the visitor must **not** be allowed to enter the patient area.

6. Recommendations regarding ventilator support are provided in the critical care section

- a. All respiratory equipment must be protected with a high efficiency filter (such as BS EN 13328-1). This filter must be disposed of after use.
- b. Disposable respiratory equipment should be used wherever possible.
- c. Re-usable equipment must, as a minimum, be decontaminated in accordance with the manufacturer's instructions
- d. Closed suctioning system must be used
- e. Ventilator circuits should not be broken unless necessary
- f. Ventilators must be placed on standby when carrying out bagging
- g. PPE must be worn
- h. Water humidification should be avoided, and a heat and moisture exchanger should be used

7. Hand hygiene

- a. This is essential before and after all patient contact, removal of protective clothing and decontamination of the environment.
- b. Use soap and water to wash hands or an alcohol hand rub if hands are visibly clean.

- c. Rings (other than a plain smooth band), wrist watches and wrist jewelry must not be worn by staff.

8. Equipment

- a. Re-useable equipment should be avoided if possible; if used, it should be decontaminated according to the manufacturer's instructions before removal from the room.
- b. Use dedicated equipment in the isolation room. Avoid storing any extraneous equipment in the patient's room
- c. Dispose of single use equipment as per clinical waste policy inside room
- d. Ventilators should be protected with high efficiency filter, such as BS EN 13328-1.
- e. Closed system suction should be used
- f. Disposable crockery and cutlery may be used in the patient's room as far as possible to minimize the numbers of items which need to be decontaminated.

9. Environmental decontamination

- a. Cleaning and decontamination should only be performed by staff trained in the use of the appropriate PPE; in some instances, this may need to be trained clinical staff rather than domestic staff.
- b. After cleaning with neutral detergent, a chlorine-based disinfectant should be used, in the form of a solution at a minimum strength of 1,000 ppm available chlorine. If an alternative disinfectant is used within the organization, the local IPCT should be consulted on this to ensure that this is effective against enveloped viruses.
- c. The main patient isolation room should be cleaned at least once a day, and following aerosol generating procedures or other potential contamination.
- d. There should be more frequent cleaning of commonly used hand-touched surfaces and of anteroom or lobby areas (at least twice per day).
- e. To ensure appropriate use of PPE and that an adequate level of cleaning, it is strongly recommended that cleaning of the isolation area is undertaken separately to the cleaning of other clinical areas.
- f. Dedicated or disposable equipment (such as mop heads, cloths) must be used for environmental decontamination.
- g. Reusable equipment (such as mop handles, buckets) must be decontaminated after use with a chlorine-based disinfectant as described above.
- h. Communal cleaning trollies should not enter the room.

10. Specimens

- a. All specimens and request forms should be marked with a biohazard label.
- b. The specimen should be double-bagged. The specimen should be placed in the first bag in the isolation room by a staff member wearing recommended PPE. The list of national testing and collection laboratories for COVID-19 is placed at Annexure A.

11. Mobile healthcare equipment

The following advice applies to devices that cannot be left in the isolation room, such as portable X-ray machines, ultrasound machines:

- a. Use of mobile healthcare equipment should be restricted to essential functions as far as possible to minimize the range of equipment taken into and later removed from the room
- b. The operator of the device, if not routinely looking after the patient, must be trained and supervised in infection prevention and control procedures, including the use of PPE
- c. The operator should wear PPE as described above when in the isolation room
- d. Any equipment taken in to the room and which must be subsequently removed, must be disinfected prior to leaving the anteroom
- e. Any additional items such as a digital detector, ultrasound probes or a cassette will also need to be disinfected, regardless of whether there has been direct contact with the patient or not. This is due to the risk of environmental contamination of the equipment within the isolation room.

12. Transfers to other departments

- a. Where possible, all procedures and investigations should be carried out in the single room with a minimal number of staff present.
- b. Only if clinical need dictates, and in consultation with the infection control team, should patients be transferred to other departments.

The following procedures then apply:

- c. The trolley used to transport the patient from the isolation room, should be disinfected as far as possible (see environmental decontamination immediately before leaving the room by an individual wearing protective clothing and PPE as described previously).
- d. The department must be informed in advance of the patient's arrival.
- e. Any extraneous equipment to be removed safely from the investigation or treatment room.
- f. The patient must be taken straight to and from the investigation or treatment room and must not wait in a communal area.
- g. The patient should wear a surgical mask if this can be tolerated - this will prevent large respiratory droplets being expelled into the environment by the wearer.
- h. The treatment or procedure room, trolley or chair and all equipment should be decontaminated after use, as per the cleaning instructions above.
- i. To enable appropriate decontamination after any procedure, patients should be scheduled at the end of a list, as far as possible.
- j. After the procedure, access to such spaces should be restricted and environmental decontamination implemented.
- k. During patient transfers, a process to ensure that no individuals not wearing PPE come within 2 meters of the patient should be followed. Anyone in the vicinity

of the patient (for example carrying out procedures, transferring the patient or standing within 2m of the patient) must wear the PPE previously described.

19. Transfer to other hospital

- a. Transfer of cases to another hospital should be avoided unless it is necessary for medical care.
- b. If transfer is essential, the receiving hospital and the ambulance staff must be advised in advance of the special circumstances of the transfer, so that appropriate infection control measures can be taken

20. Handling dead bodies

- The act of moving a recently deceased patient onto a hospital trolley for transportation to the mortuary might be sufficient to expel small amounts of air from the lungs and thereby present a minor risk.
- A **body bag** (zip bag) should be used for transferring the body and those handling the body at this point should use full PPE.
- The outer surface of the body bag should be decontaminated (see environmental decontamination) immediately before the body bag leaves the area. This may require at least 2 individuals wearing such protective clothing, in order to manage this process
- The trolley carrying the body must be disinfected prior to leaving the room.
- Prior to leaving the room, the staff members must remove their protective clothing.
- Once in the hospital mortuary, it would be acceptable to open the body bag (zip bag) for family viewing only (mortuary attendant to wear full PPE).
- Washing or preparing the body is acceptable if those carrying out the task wear PPE.
- Mortuary staff and funeral directors must be advised of the biohazard risk.
Embalming is not recommended.
- If a post mortem is required, safe working techniques (for example manual rather than power tools) should be used and full PPE worn, in the event that power tools are used
- After use, empty body bags should be disposed as per protocol of Biomedical Waste Management.



Control and Prevention of Novel Corona Virus (COVID-19)
Department of Health & Family Welfare
Government of Haryana



Chapter 04: Guidelines on Clinical management of Severe Acute Respiratory Illness (SARI) in suspect/confirmed COVID 19 cases

A. Triage: Early recognition of patients with SARI associated with COVID 19 infection.

The purpose of triage is to recognize and sort all patients with SARI at first point of contact with health care system (such as the emergency department). Consider COVID 19 as a possible etiology of SARI under certain conditions (see Table 1). Triage patients and start emergency treatments based on disease severity.

Table 1: Definitions of patients with SARI, suspected of COVID 19*

SARI	An ARI with history of fever or measured temperature $\geq 38\text{ C}^\circ$ and cough; onset within the last ~10 days; and requiring hospitalization. However, the absence of fever does NOT exclude viral infection.
Surveillance case definitions for COVID 19*	<ol style="list-style-type: none"> 1. Severe acute respiratory infection (SARI) in a person, with history of fever and cough requiring admission to hospital, with no other etiology that fully explains the clinical presentation¹ (clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised); AND any of the following: <ol style="list-style-type: none"> a) A history of travel to China, Italy, Iran, France, Spain and COVID 19 affected country in the 14 days prior to symptom onset; or b) the disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, without regard to place of residence or history of travel; or c) the person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified that fully explains the clinical presentation 2. A person with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following

	<p>exposures:</p> <p>a) close physical contact with a confirmed case of nCoV infection, while that patient was symptomatic; or</p> <p>b) a healthcare facility in a country where hospital-associated nCoV infections have been reported;</p>
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*** see <https://mohfw.gov.in/media/disease-alerts> for latest case definition**

1-Testing should be according to local guidance for management of community-acquired pneumonia. Examples of other etiologies include *Streptococcus pneumoniae*, hemophilic influenza type B, *Legionella pneumophila*, other recognized primary bacterial pneumonias, influenza viruses, and respiratory syncytial virus.

2-Close contact is defined as:

- Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with nCoV, visiting patients or staying in the same close environment of a nCoV patient
- Working together in close proximity or sharing the same classroom environment with a nCoV patient
- Traveling together with nCoV patient in any kind of conveyance
- Living in the same household as a nCoV patient

The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration

Novel Coronavirus may present with mild, moderate, or severe illness; the latter includes severe pneumonia, ARDS, sepsis and septic shock. Early recognition of suspected patients allows for timely initiation of IPC (see Table 2). Early identification of those with severe manifestations (see Table 2) allows for immediate optimized supportive care treatments and safe, rapid admission (or referral) to intensive care unit according to institutional or national protocols. For those with mild illness, hospitalization may not be required unless there is concern for rapid deterioration. All patients discharged home should be instructed to return to hospital if they develop any worsening of illness.

Table 2: Clinical syndromes associated with nCoV infection

Uncomplicated illness	Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain or malaise. The elderly and immunosuppressed may present with atypical symptoms. These patients do not have any signs of dehydration, sepsis or shortness of breath
Mild pneumonia	Patient with pneumonia and no signs of severe pneumonia. Child with non-severe pneumonia has cough or difficulty breathing + fast breathing: fast breathing (in breaths/min): <2 months, ≥ 60 ; 2–11 months, ≥ 50 ; 1–5 years, ≥ 40 and no signs of severe pneumonia

Severe pneumonia	<p>Adolescent or adult: fever or suspected respiratory infection, plus one of respiratory rate >30 breaths/min, severe respiratory distress, or SpO2 <90% on room air</p> <p>Child with cough or difficulty in breathing, plus at least one of the following: central cyanosis or SpO2 <90%; severe respiratory distress (e.g. grunting, very severe chest in drawing); signs of pneumonia with a general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions. Other signs of pneumonia may be present: chest in drawing, fast breathing (in breaths/min: <2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40. The diagnosis is clinical; chest imaging can exclude complications.</p>
Acute Respiratory Distress Syndrome	<p>Onset: new or worsening respiratory symptoms within one week of known clinical insult.</p> <p>Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules.</p>
	<p>Origin of oedema: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of oedema if no risk factor present.</p> <p>Oxygenation (adults):</p> <ul style="list-style-type: none"> • Mild ARDS: $200 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ (with PEEP or CPAP $\geq 5 \text{ cm H}_2\text{O}$, or non-ventilated) • Moderate ARDS: $100 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mmHg}$ with PEEP $\geq 5 \text{ cm H}_2\text{O}$, or non-ventilated) • Severe ARDS: $\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$, or non-ventilated) • Oxygenation (children; note OI = Oxygenation Index and OSI = Oxygenation Index using SpO2) • Bi-level NIV or CPAP $\geq 5 \text{ cmH}_2\text{O}$ via full face mask: $\text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ or $\text{SpO}_2/\text{FiO}_2 \leq 264$ • Mild ARDS (invasively ventilated): $4 \leq \text{OI} < 8$ or $5 \leq \text{OSI} < 7.5$ • Moderate ARDS (invasively ventilated): $8 \leq \text{OI} < 16$ or $7.5 \leq \text{OSI} < 12.3$ • Severe ARDS (invasively ventilated): $\text{OI} \geq 16$ or $\text{OSI} \geq 12.3$
Sepsis	<p>Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection, with organ dysfunction. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia.</p> <p>Children: suspected or proven infection and ≥ 2 SIRS criteria, of which one</p>

	must be abnormal temperature or white blood cell Count
Septic shock	Adults: persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/L Children: any hypotension (SBP < 5 th centile or > 2 SD below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR < 90 bpm or > 160 bpm in infants and HR < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia

B. Immediate implementation of appropriate Infection Prevention and Control activities

IPC is a critical and integral part of clinical management of patients and should be initiated at the point of entry of the patient to hospital (typically the Emergency Department). Standard precautions should always be routinely applied in all areas of health care facilities. Standard precautions include hand hygiene; use of PPE to avoid direct contact with patients' blood, body fluids, secretions (including respiratory secretions) and non-intact skin. Standard precautions also include prevention of needle-stick or sharps injury; safe waste management; cleaning and disinfection of equipment; and cleaning of the environment.

Table 3: How to implement infection prevention and control measures for patients with suspected or confirmed nCoV infection

At triage	<ul style="list-style-type: none"> • Give suspect patient a medical mask and direct patient to separate area, an isolation room if available. Keep at least 1 meter distance between suspected patient and other patients. • Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. Perform hand hygiene after contact with respiratory secretions
Apply droplet precautions	<ul style="list-style-type: none"> • Droplet precautions prevent large droplet transmission of respiratory viruses. Use a medical mask if working within 1-2 meters of the patient. Place patients in single rooms, or group together those with the same etiological diagnosis. If an etiological diagnosis is not possible, group patients with similar clinical diagnosis and based on epidemiological risk factors, with a spatial separation. • When providing care in close contact with a patient with respiratory symptoms (e.g. coughing or sneezing), use eye protection (face-mask or goggles), because sprays of secretions may occur. Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms

<p>Apply contact precautions</p>	<ul style="list-style-type: none"> • Droplet and contact precautions prevent direct or indirect transmission from contact with contaminated surfaces or equipment (i.e. contact with contaminated oxygen tubing/interfaces). Use PPE (medical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving. • If possible, use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use. • Ensure that health care workers refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands. Avoid contaminating environmental surfaces that are not directly related to patient care (e.g. door handles and light switches). Ensure adequate room ventilation. Avoid movement of patients or transport. Perform hand hygiene
<p>Apply airborne precautions when performing an aerosol generating procedure</p>	<ul style="list-style-type: none"> • Ensure that healthcare workers performing aerosol-generating procedures (i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation) use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators (N95 or equivalent, or higher level of protection). The scheduled fit test should not be confused with user seal check before each use. • Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 litres/second/patient in facilities with natural ventilation. Avoid the presence of unnecessary individuals in the room. Care for the patient in the same type of room after mechanical ventilation commences

Abbreviations: ARI, acute respiratory infection

C. Early supportive therapy and monitoring

- a. Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxemia, or shock: Initiate oxygen therapy at 5 L/min and titrate flow rates to reach target SpO₂
 - ≥90% in non-pregnant adults and SpO₂ ≥92-95 % in pregnant patients. Children with emergency signs (obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma or convulsions) should receive oxygen therapy during resuscitation to target SpO₂ ≥94%; otherwise, the target SpO₂ is ≥90%. All areas where patients with SARI are cared for should be equipped with pulse oximeters, functioning oxygen systems and disposable, single-use, oxygen- delivering interfaces (nasal cannula, simple face mask, and mask with

reservoir bag). Use contact precautions when handling contaminated oxygen interfaces of patients with nCoV infection

- b. Use conservative fluid management in patients with SARI when there is no evidence of shock: Patients with SARI should be treated cautiously with intravenous fluids, because aggressive fluid resuscitation may worsen oxygenation, especially in settings where there is limited availability of mechanical ventilation
- c. Give empiric antimicrobials to treat all likely pathogens causing SARI. Give antimicrobials within one hour of initial patient assessment for patients with sepsis: Although the patient may be suspected to have nCoV, administer appropriate empiric antimicrobials within ONE hour of identification of sepsis.

Empiric antibiotic treatment should be based on the clinical diagnosis (community-acquired pneumonia, health care-associated, local epidemiology and susceptibility data, and treatment guidelines. Empirical therapy includes a neuraminidase inhibitor for treatment of influenza when there is local circulation or other risk factors, including travel history or exposure to animal influenza viruses. Empirical therapy should be de-escalated on the basis of microbiology results and clinical judgment

- d. Do not routinely give systemic corticosteroids for treatment of viral pneumonia or ARDS outside of clinical trials unless they are indicated for another reason: A systematic review of observational studies of corticosteroids administered to patients with SARS reported no survival benefit and possible harms (avascular necrosis, psychosis, diabetes, and delayed viral clearance). A systematic review of observational studies in influenza found a higher risk of mortality and secondary infections with corticosteroids; the evidence was judged as very low to low quality due to confounding by indication. A subsequent study that addressed this limitation by adjusting for time- varying confounders found no effect on mortality. Finally, a recent study of patients receiving corticosteroids for MERS used a similar statistical approach and found no effect of corticosteroids on mortality but delayed lower respiratory tract (LRT) clearance of MERS-CoV. Given lack of effectiveness and possible harm, routine corticosteroids should be avoided unless they are indicated for another reason. See section F for the use of corticosteroids in sepsis.
- e. Closely monitor patients with SARI for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately: Application of timely, effective, and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of nCoV
- f. Understand the patient's co-morbid condition(s) to tailor the management of critical illness and appreciate the prognosis: During intensive care management of SARI, determine which chronic therapies should be continued and which therapies should be stopped temporarily
- g. Communicate early with patient and family: Communicate proactively with patients and families and provide support and prognostic information. Understand the patient's values and preferences regarding life-sustaining interventions

D. Collection of specimens for laboratory diagnosis

Guidance on specimen collection, processing, transportation, including related biosafety procedures, is available on <https://mohfw.gov.in/media/disease-alerts>

Points to remember

- Collect blood cultures for bacteria that cause pneumonia and sepsis, ideally before antimicrobial therapy. DO NOT delay antimicrobial therapy to collect blood cultures
- Collect specimens from BOTH the upper respiratory tract (URT; nasopharyngeal and oropharyngeal) AND lower respiratory tract (LRT; expectorated sputum, endotracheal aspirate, or bronchoalveolar lavage) for nCoV testing by RT-PCR. Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients)
- Use appropriate PPE for specimen collection (droplet and contact precautions for URT specimens; airborne precautions for LRT specimens). When collecting URT samples, use viral swabs (sterile Dacron or rayon, not cotton) and viral transport media. Do not sample the nostrils or tonsils. In a patient with suspected novel coronavirus, especially with pneumonia or severe illness, a single URT sample does not exclude the diagnosis, and additional URT and LRT samples are recommended. LRT (vs. URT) samples are more likely to be positive and for a longer period. Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients). Sputum induction should be avoided due to increased risk of increasing aerosol transmission.

Dual infections with other respiratory viral infections have been found in SARS and MERS cases. At this stage we need detailed microbiologic studies in all suspected cases. Both URT and LRT specimens can be tested for other respiratory viruses, such as influenza A and B (including zoonotic influenza A), respiratory syncytial virus, parainfluenza viruses, rhinoviruses, adenoviruses, enteroviruses (e.g. EVD68), human meta pneumovirus, and endemic human coronaviruses (i.e. HKU1, OC43, NL63, and 229E). LRT specimens can also be tested for bacterial pathogens, including *Legionella pneumophila*

In hospitalized patients with confirmed nCoV infection, repeat URT and LRT samples should be collected to demonstrate viral clearance. The frequency of specimen collection will depend on local circumstances but should be at least every 2 to 4 days until there are two consecutive negative results (both URT and LRT samples if both are collected) in a clinically recovered patient at least 24 hours apart. If local infection control practice requires two negative results before removal of droplet precautions, specimens may be collected as often as daily

E. Management of hypoxemic respiratory failure and ARDS

Recognize severe hypoxemic respiratory failure when a patient with respiratory distress is failing standard oxygen therapy. Patients may continue to have increased work of breathing or hypoxemia even when oxygen is delivered via a face mask with reservoir bag (flow rates of 10-15 L/min, which is typically the minimum flow required to maintain bag inflation; FiO₂ 0.60-

0.95). Hypoxemic respiratory failure in ARDS commonly results from intrapulmonary ventilation-perfusion mismatch or shunt and usually requires mechanical ventilation.

High-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) should only be used in selected patients with hypoxemic respiratory failure. The risk of treatment failure is high in patients with MERS treated with NIV, and patients treated with either HFNO or NIV should be closely monitored for clinical deterioration. HFNO systems can deliver 60 L/min of gas flow and FiO₂ up to 1.0; paediatric circuits generally only handle up to 15 L/min, and many children will require an adult circuit to deliver adequate flow. Compared to standard oxygen therapy, HFNO reduces the need for intubation. Patients with hypercapnia (exacerbation of obstructive lung disease, cardiogenic pulmonary edema), hemodynamic instability, multi-organ failure, or abnormal mental status should generally not receive HFNO, although emerging data suggest that HFNO may be safe in patients with mild-moderate and non-worsening hypercapnia.²⁵ Patients receiving HFNO should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hr.). Evidence-based guidelines on HFNO do not exist, and reports on HFNO in MERS patients are limited.

NIV guidelines make no recommendation on use in hypoxemic respiratory failure (apart from cardiogenic pulmonary edema and post-operative respiratory failure) or pandemic viral illness (referring to studies of SARS and pandemic influenza). Risks include delayed intubation, large tidal volumes, and injurious Trans-pulmonary pressures. Limited data suggest a high failure rate when MERS patients receive NIV. Patients receiving a trial of NIV should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hour). Patients with hemodynamic instability, multi organ failure, or abnormal mental status should not receive NIV.

Recent publications suggest that newer HFNO and NIV systems with good interface fitting do not create widespread dispersion of exhaled air and therefore should be associated with low risk of airborne transmission.

Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions. Patients with ARDS, especially young children or those who are obese or pregnant, may desaturate quickly during intubation. Pre-oxygenate with 100% FiO₂ for 5 minutes, via a face mask with reservoir bag, bag-valve mask, HFNO, or NIV. Rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation.

Implement mechanical ventilation using lower tidal volumes (4–8 ml/kg predicted body weight, PBW) and lower inspiratory pressures (plateau pressure <30 cmH₂O). This is a strong recommendation from a clinical guideline for patients with ARDS, and is suggested for patients with sepsis-induced respiratory failure who do not meet ARDS criteria. The initial tidal volume is 6 ml/kg PBW; tidal volume up to 8 ml/kg PBW is allowed if undesirable side effects occur. Hypercapnia is permitted if meeting the pH goal of 7.30-7.45. Ventilator protocols are available. The use of deep sedation may be required to control respiratory drive and achieve

tidal volume targets. Although high driving pressure (plateau pressure–PEEP) may more accurately predict increased mortality in ARDS compared to high tidal volume or plateau pressure, RCTs of ventilation strategies that target driving pressure are not currently available. In patients with severe ARDS, prone ventilation for >12 hours per day is recommended in early stages of ARDS up to 24 hours will be helpful. Application of prone ventilation is strongly recommended for adult and paediatric patients with severe ARDS but requires sufficient human resources and expertise to be performed safely. Use a conservative fluid management strategy for ARDS patients without tissue hypo-perfusion.

In patients with moderate or severe ARDS, higher PEEP instead of lower PEEP is suggested. PEEP titration requires consideration of benefits (reducing atelectrauma and improving alveolar recruitment) vs. risks (end-inspiratory over-distension leading to lung injury and higher pulmonary vascular resistance). Tables are available to guide PEEP titration based on the FiO₂ required to maintain SpO₂. A related intervention of recruitment manoeuvres (RMs) is delivered as episodic periods of high continuous positive airway pressure [30–40 cm H₂O], progressive incremental increases in PEEP with constant driving pressure, or high driving pressure; considerations of benefits vs. risks are similar. Higher PEEP and RMs were both conditionally recommended in a clinical practice guideline. For PEEP, the guideline considered an individual patient data meta-analysis of 3 RCTs. However, a subsequent RCT of high PEEP and prolonged high-pressure RMs showed harm, suggesting that the protocol in this RCT should be avoided. Monitoring of patients to identify those who respond to the initial application of higher PEEP or a different RM protocol, and stopping these interventions in non-responders, is suggested.

In patients with moderate-severe ARDS (PaO₂/FiO₂ <150), neuromuscular blockade by continuous infusion should not be routinely used. One trial found that this strategy improved survival in patients with severe ARDS (PaO₂/FiO₂ <150) without causing significant weakness, but results of a recent larger trial found that use of neuromuscular blockage with high PEEP strategy was not associated with survival when compared to a light sedation strategy without neuromuscular blockade. Continuous neuromuscular blockade may still be considered in patients with ARDS in certain situations: or refractory hypoxemia or hypercapnia.

In settings with access to expertise in extracorporeal life support (ECLS), consider referral of patients with refractory hypoxemia despite lung protective ventilation. A recent guideline made no recommendation about ECLS in patients with ARDS.

Since then, an RCT of ECLS for patients with ARDS was stopped early and found no statistically significant difference in the primary outcome of 60-day mortality between ECLS and standard medical management (including prone positioning and neuromuscular blockade). However, ECLS was associated with a reduced risk of the composite outcome of mortality and crossover to ECLS, and a post hoc Bayesian analysis of this RCT showed that ECLS is very likely to reduce mortality across a range of prior assumptions. In patients with MERS-CoV infection, ECLS vs. conventional treatment was associated with reduced mortality in a cohort study. ECLS should only be offered in expert centers with a sufficient case volume to maintain expertise and that can apply the IPC measures required for nCoV patients

Avoid disconnecting the patient from the ventilator, which results in loss of PEEP and

atelectasis. Use in-line catheters for airway suctioning and clamp endotracheal tube when disconnection is required (for example, transfer to a transport ventilator)

F. Management of septic shock

Recognize septic shock in adults when infection is suspected or confirmed AND vasopressors are needed to maintain mean arterial pressure (MAP) ≥ 65 mmHg AND lactate is ≥ 2 mmol/L, in absence of hypovolemia. Recognize septic shock in children with any hypotension (systolic blood pressure [SBP]

< 5 th centile or > 2 SD below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR < 90 bpm or > 160 bpm in infants and HR < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.

In the absence of a lactate measurement, use MAP and clinical signs of perfusion to define shock. Standard care includes early recognition and the following treatments within 1 hour of recognition: antimicrobial therapy and fluid loading and vasopressors for hypotension. The use of central venous and arterial catheters should be based on resource availability and individual patient needs. Detailed guidelines are available for the management of septic shock in adults and children.

In resuscitation from septic shock in adults, give at least 30 ml/kg of isotonic crystalloid in adults in the first 3 hours. In resuscitation from septic shock in children in well-resourced settings, give 20 ml/kg as a rapid bolus and up to 40-60 ml/kg in the first 1 hr.

Do not use hypotonic crystalloids, starches, or gelatins for resuscitation.

Fluid resuscitation may lead to volume overload, including respiratory failure. If there is no response to fluid loading and signs of volume overload appear (for example, jugular venous distension, crackles on lung auscultation, pulmonary oedema on imaging, or hepatomegaly in children), then reduce or discontinue fluid administration. This step is particularly important where mechanical ventilation is not available. Alternate fluid regimens are suggested when caring for children in resource-limited settings.

Crystalloids include normal saline and Ringer's lactate. Determine need for additional fluid boluses (250-1000 ml in adults or 10-20 ml/kg in children) based on clinical response and improvement of perfusion targets. Perfusion targets include MAP (> 65 mmHg or age-appropriate targets in children), urine output (> 0.5 ml/kg/hr in adults, 1 ml/kg/hr in children), and improvement of skin mottling, capillary refill, level of consciousness, and lactate. Consider dynamic indices of volume responsiveness to guide volume administration beyond initial resuscitation based on local resources and experience. These indices include passive leg raises, fluid challenges with serial stroke volume measurements, or variations in systolic pressure, pulse pressure, inferior vena cava size, or stroke volume in response to changes in intrathoracic pressure during mechanical ventilation.

Starches are associated with an increased risk of death and acute kidney injury vs. crystalloids. The effects of gelatins are less clear, but they are more expensive than crystalloids. Hypotonic (vs. isotonic) solutions are less effective at increasing intravascular volume. Surviving Sepsis also suggests albumin for resuscitation when patients require substantial amounts of crystalloids, but this conditional recommendation is based on low-quality evidence.

Administer vasopressors when shock persists during or after fluid resuscitation. The initial blood pressure target is MAP \geq 65 mmHg in adults and age-appropriate targets in children.

If central venous catheters are not available, vasopressors can be given through a peripheral IV, but use a large vein and closely monitor for signs of extravasation and local tissue necrosis. If extravasation occurs, stop infusion. Vasopressors can also be administered through intraosseous needles.

If signs of poor perfusion and cardiac dysfunction persist despite achieving MAP target with fluids and vasopressors, consider an inotrope such as dobutamine

Vasopressors (i.e. norepinephrine, epinephrine, vasopressin, and dopamine) are most safely given through a central venous catheter at a strictly controlled rate, but it is also possible to safely administer them via peripheral vein and intraosseous needle. Monitor blood pressure frequently and titrate the vasopressor to the minimum dose necessary to maintain perfusion and prevent side effects. Norepinephrine is considered first-line in adult patients; epinephrine or vasopressin can be added to achieve the MAP target. Because of the risk of tachyarrhythmia, reserve dopamine for selected patients with low risk of tachyarrhythmia or those with bradycardia. In children with cold shock (more common), epinephrine is considered first-line, while norepinephrine is used in patients with warm shock (less common).

G. Prevention of complications

Implement the following interventions (Table 4) to prevent complications associated with critical illness. These interventions are based on Surviving Sepsis or other guidelines, and are generally limited to feasible recommendations based on high quality evidence.

Table 4: Prevention of complications

Anticipated Outcome	Interventions
Reduce days of invasive mechanical ventilation	<ul style="list-style-type: none"> • Use weaning protocols that include daily assessment for readiness to breathe spontaneously • Minimize continuous or intermittent sedation, targeting specific titration endpoints (light sedation unless contraindicated) or with daily interruption of continuous sedative infusions

Reduce incidence of ventilator associated pneumonia	<ul style="list-style-type: none"> • Oral intubation is preferable to nasal intubation in adolescents and adults • Keep patient in semi-recumbent position (head of bed elevation 30-45°) • Use a closed suctioning system; periodically drain and discard condensate in tubing • Use a new ventilator circuit for each patient; once patient is ventilated, change circuit if it is soiled or damaged but not routinely • Change heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days
Reduce incidence of venous thromboembolism	<ul style="list-style-type: none"> • Use pharmacological prophylaxis (low molecular-weight heparin [preferred if available] or heparin 5000 units subcutaneously twice daily) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices).
Reduce incidence of catheter related bloodstream infection	<ul style="list-style-type: none"> • Use a checklist with completion verified by a real-time observer as reminder of each step needed for sterile insertion and as a daily reminder to remove catheter if no longer needed
Reduce incidence of pressure ulcers	<ul style="list-style-type: none"> • Turn patient every two hours
Reduce incidence of stress ulcers and gastrointestinal bleeding	<ul style="list-style-type: none"> • Give early enteral nutrition (within 24–48 hours of admission) • Administer histamine-2 receptor blockers or proton-pump inhibitors in patients with risk factors for GI bleeding. Risk factors for gastrointestinal bleeding include mechanical ventilation for ≥48 hours, coagulopathy, renal replacement therapy, liver disease, multiple comorbidities, and higher organ failure score
Reduce incidence of ICU-related weakness	<ul style="list-style-type: none"> • Actively mobilize the patient early in the course of illness when safe to do so

H. Specific anti-COVID 19 treatments and clinical research

There is no current evidence from RCTs to recommend any specific anti-nCoV treatment for patients with suspected or confirmed nCoV. Unlicensed treatments should be administered

only in the context of ethically-approved clinical trials or the Monitored Emergency Use of Unregistered Interventions Framework (MEURI), with strict monitoring.

Clinical characterization protocols are available, including the SPRINT-SARI <https://isaric.tghn.org/sprint-sari/> and WHOISARIC forms available at <https://isaric.tghn.org/protocols/severe-acute-respiratory-infection-data-tools/>.

I. Special considerations for pregnant patients

Pregnant women with suspected or confirmed nCoV should be treated with supportive therapies as described above, taking into account the physiologic adaptations of pregnancy. The use of investigational therapeutic agents outside of a research study should be guided by individual risk-benefit analysis based on potential benefit for mother and safety to fetus, with consultation from an obstetric specialist and ethics committee.

Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and fetal stability. Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential.

Note: These guidelines are preliminary in nature and will be updated as soon as more information on clinical profile and treatment are available.



Chapter 05: Protocol on Sample Collection and Packaging

- 1. Scope:** To be used by the Government health authorities/ hospitals/ clinicians/ laboratories planning to collect appropriate clinical samples as indicated for diagnosis of COVID 19.
- 2. Purpose:** This document describes the information for collection, packaging and transport of clinical specimens Laboratory for diagnosis of COVID 19.
- 3. Responsibilities:**
 - a. The clinician should decide necessity for collection of clinical specimens for laboratory testing of 2019-nCoV only after following the case definition as given by the health authorities, Government of India.
 - b. Appropriate clinical samples need to be collected by Pulmonologist trained in specimen collection in presence of a Microbiologist.
 - c. By following all biosafety precautions and using personal protective equipment (PPEs), clinical samples need to be sent to the designated laboratory by following standard triple packaging.
- 4. Selection of patient:** Any person who presents with COVID 19 symptoms and any one of the following i.e. a history of travel from COVID affected countries in 14 days prior to symptoms onset; disease in healthcare worker working in an environment of COVID 19 patients; unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment; should be urgently investigated.
- 5. Specimen labelling and processing:**
 - a. Personal protective equipment (apron, hand gloves, face shield, N95 Masks etc.) need to be used and all biosafety precautions should be followed so as to protect individuals and the environment.
 - b. Proper labelling (name/age/gender/specimen ID) need to be done on specimen container and other details of sender (name/address/phone number) on the outer container by mentioning "To be tested for COVID-19".
- 6. Samples to be collected**
 - a. Nasopharyngeal swab / Nasal Swabs – 2
 - b. Throat Swab
 - c. Before collecting the samples, it requires to be ensured that neck is in extended position.
 - d. Nasopharyngeal swab will be collected with the per nasal swab provided in the

kit, after taking out the swab it is passed along the floor of nasal cavity and left there for about five second and transferred into VTM and transported to the designated lab at 4 degree Celsius as soon as possible (same day).

- e. For collection of samples from throat area the other sterilized swab is swabbed over the tonsillar area and posterior pharyngeal wall and finally transferred into Viral Transport Medium, VTM and stored and transported to the designated lab at 4 degree Celsius as soon as possible (same day).
- f. Other respiratory material like endotracheal aspirated/Broncho-alveolar lavage in patients with more severe respiratory disease can also be collected and transported in the same way.
- g. Place specimens for transport in leak-proof specimen bags /Ziploc pouch (secondary container) with the patient's label on the specimen container (primary container), and a clearly written laboratory request form.
- h. Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled.
- i. Document patient's full name, age / date of birth of suspected 2019-nCoV case of potential concern clearly on the accompanying laboratory request form.
- j. Notify the laboratory as soon as possible that the specimen is being transported.

7. Checklist of items for preparedness for sample collection from suspected new coronavirus outbreak cases -

It is recommended that sample collection from suspected new corona virus outbreak cases should be carried out in a dedicated isolated room with independent air handling facility through use of exhaust fans and appropriate HEPA filters.

- A. Guidelines for sample collection and transportation
- B. Hand sanitizer
- C. Round the clock running water and soap
- D. PPE (Personal Protective Equipment) Kits containing at least:
 - a) Head cover
 - b) N-95 Respirator or equivalent
 - c) Eye goggles/Face shield
 - d) Full sleeved outer impermeable gown / overalls
 - e) Gloves
 - f) Shoe Covers
 - g) Patient proforma for 2019-nCoV testing
 - h) Viral Transport Medium Vial
 - i) Sterile individually packed swabs with flocced nylon/Dacron/polyester tips with synthetic shaft with break point
 - j) Permanent markers
 - k) Tongue depressors
 - l) Triple layer packaging materials including:

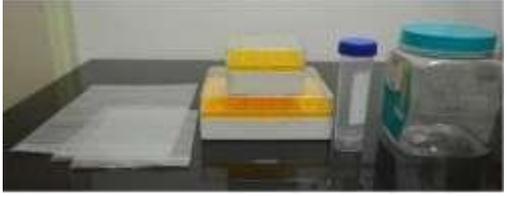
- i. Paraffin tape or equivalent for sealing individual VTM vials
 - ii. Cotton or absorbent material
 - iii. Clear ziplock bags
 - iv. Ice packs
 - v. Vaccine carriers
 - vi. Thermocol boxes
 - vii. Biohazard labels
- m) Refrigerators
- n) Deep freezers, if samples are to be stored beyond 48 hrs
- o) Facilities for disposal of bio-medical waste as per latest bio medical waste management rules
- p) Colored bins with colored disposal bio-medical waste bags, available at the anteroom for bio medical hazard
 - i. Puncture proof container
 - ii. Sodium hypochlorite
 - iii. SPILL KIT containing at least:
 - iv. PPE KIT
 - v. Warning labels – Biohazard, “DO NOT ENTER” sign
 - vi. Marker/Chalk
 - vii. 1% freshly prepared sodium hypochlorite
 - viii. Cotton/Tissue paper rolls/Blotting paper/Absorbent material
 - ix. Tongs /Forceps and Dust pan
 - x. BMW Bags
 - xi. Mops and floor disinfectants

8. Specimen collection details (Adapted from the WHO guidelines on 2019-nCoV):

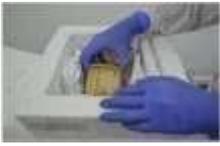
Specimen type	Collection materials	Transport to laboratory	Storage till testing	Comments
Nasopharyngeal and oropharyngeal swab	Dacron or polyester floccated swabs*	4 °C	≤5 days: 4 °C >5 days: -70 °C	The nasopharyngeal and oropharyngeal swabs should be placed in the same tube to increase the viral load
Broncho alveolar lavage	sterile container*	4 °C	≤48 hours: 4 °C >48 hours: -70 °C	There may be some dilution of pathogen, but still a worthwhile specimen
Tracheal aspirate, nasopharyngeal aspirate or nasal wash	sterile container*	4 °C	≤48 hours: 4 °C >48 hours: -70 °C	Not applicable
Sputum	sterile container	4 °C	≤48 hours: 4 °C >48 hours: -70 °C	Ensure the material is from the lower respiratory tract
Tissue from biopsy or autopsy including from lung	sterile container with saline	4 °C	≤24 hours: 4 °C >24 hours: -70 °C	Autopsy sample collection preferably to be avoided
Serum (2 samples – acute and convalescent)	Serum separator tubes (adults: collect 3-5 ml whole blood)	4 °C	≤5 days: 4 °C >5 days: -70 °C	Collect paired samples: acute – first week of illness convalescent – 2 to 3 weeks later

*For transport of samples for viral detection, use VTM (viral transport medium) containing antifungal and antibiotic supplements. Avoid repeated freezing and thawing of specimens.

9. Requirements for Clinical Samples Collection, Packaging and Transport

<p>1. Sample vials and Virus Transport Medium (VTM)</p> 	<p>2. Adsorbent material (cotton, tissue paper), paraffin, scissor, cello tape</p> 	<p>3. A leak-proof secondary container (e.g., ziploc pouch, cryobox, 50 ml centrifuge tube, plastic container)</p> 
<p>4. Hard-frozen Gel Packs</p> 	<p>5. A suitable outer container (e.g., thermocol box, ice-box, cardboard box) (minimum dimensions: 10 x 10 x 10 cm)</p> 	

10. Procedure for Specimen Packaging and Transport

<p>1. Use PPE while handling specimen</p> 	<p>2. Seal the neck of the sample vials using parafilm</p> 	<p>3. Cover the sample vials using absorbent material</p> 	<p>4. Arrange primary container (vial) in secondary container</p> 
<p>5. Placing the centrifuge tube inside a zip-lock pouch</p> 	<p>6. Placing the zip-lock pouch inside a sturdy plastic container and seal the neck of the container</p> 	<p>Note: Sample vials can also be placed inside a zip-lock pouch, covered in absorbent material and secured by heat-sealing or rubber bands. Then, the zip-lock pouch should be placed inside another plastic pouch and secured</p>	<p>7. Using a thermocol box as an outer container and placing the secondary container within it, surrounded by hard- frozen gel packs</p> 
<p>7. Using a hard cardboard box as an outer container and placing the secondary container and the gel packs</p> 	<p>8. Placing the completed Specimen Referral Form (available on www.niv.co.in) and request letter inside a leak-proof, zip-lock pouch</p> 	<p>9. Securing the zip-lock pouch with the Specimen Referral Form on the outer container</p> 	<p>10. Attaching the labels: Senders' address, contact number; Consignee's address /contact number; Biological substance- Category B; 'UN 3373'; Orientation label, Handle with care</p>

			
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11. Documents to accompany:

- a. Packaging list/proforma Invoice
- b. Air way bill (for air transport) (to be prepared by sender or shipper)
- c. Value equivalence document (for road/rail/sea transport)

[Note: A vaccine-carrier/ice-box can also be used as an outer container. The minimum dimensions of the outer container should be 10 x 10 x 10 cm (length x width x height)]



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Chapter 06: Protocol on Biomedical Waste Management of COVID 19
Patients

Protocol is based on Bio-medical waste management rules for BMW from patients in Corona Virus Ward/OPD. Only pre-treatment and segregation will be done in the hospital and the final disposal will be done by common biomedical waste treatment and disposal facility (CBMWTF).

1. Biomedical waste devices, articles generated during diagnosis, treatment, management, immunization from patients with nCoV and HCW working in such ward/OPD should be managed in accordance with safe routine procedures and rules.

I. Yellow Category

1. **Human Anatomical Waste:** Human tissues, biopsy are to be disposed off in yellow coloured non-chlorinated plastic bags.
2. **Soiled Waste:** Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components are disposed off in yellow bag.
3. **Cytotoxic drug vials** shall not be handed over to unauthorized person. Expired cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature $>1200^{\circ}\text{C}$. Leftover cytotoxic drugs and items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc to common biomedical waste treatment facility for incineration at $>1200^{\circ}\text{C}$ in yellow bag or container with cytotoxic label.
4. **Chemical Waste:** Chemicals used in production of biological and used or discarded solid disinfectants, residual or discarded chemical solid waste and chemical sludge are discarded in yellow coloured non-chlorinated plastic bags or containers and disposed of by incineration by CBMWTF.

5. **Liquid waste** generated due to use of chemicals in production of biologicals, used or discarded disinfectants, patients samples infected secretions, aspirated body fluids liquid from laboratory, ward, OT and disinfecting activities etc should be collected separately and made safe by disinfection by chemical treatment using 1-2% sodium hypochlorite solution for a contact period of 30 min and directed to effluent treatment system or then discharged into drains/sewers. The combined discharge should conform to the discharge norms given in schedule III, as per BMWM (Principal) rules, 2016.
6. **Discarded items:** Linen, Mattresses, beddings contaminated with blood or body fluid Non-chlorinated (lime/alcoholic: 5 % Lysol for 30 minutes, 5% Phenol for 30 min) or 1-2% sodium hypochlorite chemical disinfection followed by shredding and customized to fit in non-chlorinated yellow bag for incineration.
7. **Microbiology, biotechnology waste:** Microbiology, biotechnology waste i.e. laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, humans and animals cell culture used in research, residual toxins culture plates dishes have to be pre-treated on site by autoclaving in an autoclave safe plastic bag/container there after sent for final disposal in its respective colour category to CBMWTF. The discarded blood bags are to be counted, sealed, weighed and all the records to be made and then packed in autoclave safe plastic bags or containers to be autoclaved on site and then sent in yellow bag to CBMWTF for incineration.

II. Red category

1. **Contaminated Waste (Recyclable):** Wastes generated from disposable items such as tubing, drains, oxygen mask, bottles, intravenous tubes and sets (with needles cut), catheters, urine bags, and gloves are nicked, wherever applicable and put in red bag. The needles are cut with the needle destroyer/needle cutter preferably. The cut/mutilated syringe is disposed finally in red coloured non chlorinated plastic bags or containers.

III. Translucent (White) Category

1. **Waste sharps including Metals:** Needles, needles from needle tip cutter or burner, scalpels, blades or any other contaminated sharp object that may cause puncture and cuts. The needles are cut with the needle destroyer/needle cutter preferably. This includes both used, discarded and contaminated metal sharps. These are stored in tamper proof, leak proof and puncture proof containers for sharps storage. Collect and send for final disposal when 3/4 full. These are sent to central common waste site in tamper proof, leak proof and puncture proof containers for final disposal to CBMWTF.

IV. Blue category:

1. **Glass and metallic implants:** The blood sample glass vials or broken or discarded and contaminated glass like slides etc. have to be disinfected (1-2% sodium hypochlorite for 30 minutes at least) to be packed in puncture proof and leak proof

boxes or containers with blue coloured marking and then sent to common central waste site for final disposal to CBMWTF. The uninfected glass like medicine bottles or ampoules which are not infected and are put in puncture proof and leak proof boxes or containers with blue coloured marking. The metallic implants are pre-treated in the same manner and are to be packed in separate puncture proof and leak proof boxes or containers with blue coloured marking.

V. Color-coded bags & Colour Category wise Treatment

Category	Type of Waste	Type of Bag or Container to be used*	Treatment and Disposal options
Yellow	Human anatomical Waste:	Yellow coloured non-chlorinated plastic bags	Incineration by CBMWTF
	Human anatomical Waste:		
	Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton Swabs		Incineration by CBMWTF
	Expired or discarded medicines- antibiotics, cytotoxic drugs	Yellow coloured non-chlorinated plastic bags or containers with cytotoxic labels	Expired cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature >1200 °C. Leftover cytotoxic drugs and items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc to common biomedical waste treatment facility for incineration at >1200 °C.
	Chemical Waste: solid discarded chemicals	Yellow coloured non-chlorinated plastic bags or containers	Disposed of by incineration by CBMWTF
	Chemical Liquid Waste: Liquid waste generated due to use of chemicals and used or discarded Disinfectants	Separate collection system leading to effluent treatment plant (ETP) system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in BMW rules, 2016

	Discarded linen: contaminated with blood or body fluid.	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated (alcoholic: 5% lysol, 5% phenol) chemical disinfection followed by incineration.
	Routine mask and Gown		Incineration
	Microbiology, Biotechnology and other clinical laboratory waste, PVC Blood bags	Autoclave safe plastic bags or containers	Autoclave or Pre-treat to disinfect.** Treated waste to be sent to CBMWTF for incineration.
Red	Contaminated Waste (Recyclable) Plastics tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vacutainers with their needles cut) and gloves	Red-coloured non chlorinated plastic bags or containers	Treated waste to be sent to CBMWTF who would after sterilization and shredding send such waste to registered or authorized recyclers or for energy recovery
White (Translucent)	Waste Sharps	Puncture proof, Leak proof, tamper proof containers	Disinfection/Autoclaving or dry heat sterilization/ sent to CBMWTF and who will ensure final disposal to iron foundries (having consent to operate from the SPCB/PCC)
Blue	Glass: medicine glass vials or broken or discarded and contaminated glass	Puncture proof and leak proof boxes or containers with blue coloured marking	Autoclaving/Microwaving/hydroclaving by CBMWTF and then recycling. Contaminated glass slides require pre-treatment (disinfection by sodium hypochlorite)
	Metal implants/metal guns	Puncture proof and leak proof boxes or containers with blue colored marking	

*Barcode label will have to be made available on every bag or container as per CPCB guidelines

**For disinfection of BMWM articles freshly prepared 1-2% Sodium hypochlorite is recommended

***1% Sodium hypochlorite is 1:100 dilution (525-615 ppm of available chlorine)

****Hospital supply of sodium hypochlorite is 10% or 4% (please see label and manufacturer's instructions)

*****All lab waste, patient's samples, blood bags, toxins, live vaccines, cultures (liquid/solid), devices used to transfer cultures need pre-treatment

VI Articles: bins, bags, trolleys

1. Bags

- a. The bags used for storing and transporting biomedical waste shall be in compliance with the Bureau of Indian Standards. Till the Standards are published, the carry bags shall be as per the Plastic Waste Management Rules, 2016.
- b. Yellow, Blue, Red and translucent bags/bins/containers are marked with Biohazard symbol, hospital logo and with barcoding to be supplied by CBMWTF.

2. Bins

- a. **Containment of waste:** An optimum number of easy to use, standard, uniform, covered, foot operated bins of colors i.e, yellow, red bins of appropriate size would be placed at identified places in all clinical areas.
- b. **Disinfection of Bins:** Chemical disinfection of the waste bins using hypochlorite solution (1-2%) should be done frequently at a separate washing facility in the hospital, daily preferably, at least once a week.

3. Segregation, package and then transport and storage to common waste site

- a. All the biomedical waste is labelled as waste type, site of generation, date of generation before transportation from the generation site.
- b. Waste is stored in the areas of generation at an identified safe area, for an interim period after which it is transported to CBMWTF for final treatment and final disposal.
- c. During this period, it is the responsibility of the administration, sanitation and security staff to ensure the safety and prevention of pilferage and recycling of the waste.
- d. No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.

4. Collection

- a. It is done twice daily or more frequently from wards/laboratories.
- b. Label is filled up by staff on duty and given to waste collectors
- c. Each patient care area has been provided with the waste receipt (log) book to record the quantity /number of yellow, blue, red, white (translucent) bags handed

over to HCW.

- d. All the staff are required to duly fill in the waste book color code wise mentioning the number and size of bags handed over and sign the slip for further record and also to fill BMW register daily colour category wise.

5. Transportation

- a. Hospital waste is transported in securely tied bags from the site of generation to central waste storage site through designated route, on dedicated, color coded, covered and leak proof wheel barrows/Trolleys.
- b. At the waste treatment premises verification of the number/size of the bags is done for each trolley by the sanitation staff for recording and quantification and barcoding before disposal.
- c. The central waste storage site is cleaned daily.
- d. Chemical disinfection of the trolleys using hypochlorite solution is being done at the waste storage site, should be cleaned and disinfected daily.

6. Transportation to CBMWTF

- a. The operator of CBMWTF shall transport the bio-medical waste from the premises of an occupier to any off-site bio-medical waste treatment facility only in the vehicles having label as per BMWM (Principal) rules, 2016.
- b. The vehicles used for transportation of biomedical waste shall comply with the conditions stipulated by the SPCB in addition to the requirement contained in the Motor Vehicles Act, 1988 (59 of 1988), or the rules made there under for transportation of such infectious waste.
- c. Global positioning system has been added by the CBMWTF.



Chapter 07: Protocol on Ambulance Transfer

When a suspect case of COVID 19 patient has to be transported, the following precautions should be taken by ambulance personnel accompanying the patient:

1. On arrival to the healthcare facility from where the patient is to be transferred.

- i. Decontaminate hands (alcohol gel/rub).
- ii. Don Personal Protective Equipment (PPE).

A patient requiring Aerosol Generating Precaution: N95 mask with respirator, gloves, long sleeved fluid repellent gown and goggles.

- iii. Inform the hospital of the admission/transfer of a potentially infectious person.

2. Before leaving the house/healthcare facility

- i. Request patient to wear a surgical mask (if tolerated) and advise on respiratory hygiene and cough etiquette.
- ii. A patient with suspected or confirmed COVID 19 should not travel with other patients.

3. In ambulance

- i. Remove gloves, decontaminate hands and put on new gloves before touching the patient and before performing a aseptic procedure, if required. Wearing gloves does not replace hand hygiene.
- ii. Use single use or single patient use medical equipment where possible.
- iii. Use disposable linen if available.
- iv. In the ambulance, if the driver's chamber is not separate, driver should also use PPE.

4. Arrival to the referral hospital

- i. Before the patient leaves the ambulance ensure arrangements are in place for receipt of the patient.
- ii. Transfer patient to the care of hospital staff.
- iii. After transfer of patient remove PPE
- iv. Perform hand hygiene

5. Before ambulance is used again

- a. **Cleaning and disinfecting** (PPE as outlined above should be worn while cleaning)
Surfaces (stretcher, chair, door handles) should be cleaned with a freshly prepared 1% hypochlorite solution or equivalent
- b. **Laundry:** Place reusable blankets in a bag, then put into a laundry bag and send for laundering clearly labelling it so that person in the laundry wears appropriate PPE before handling or autoclaves it before opening.
- c. **Medical equipment:** Follow manufacturer's instructions for cleaning/ disinfecting reusable equipment
- d. **Management of waste:** All masks and any waste contaminated with blood or body fluid (including respiratory secretions) should be disposed of as infectious waste in yellow bag
- e. **Management of sharps** – Refer to Bio-medical Waste Management Protocols
- f. **Management of spillages of blood and body fluids** – Refer to Bio-medical Waste Management Protocols



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Chapter 08: Protocol for Quarantine at Home

1. Any person(s) suggestive of 2019-nCoV, should be confined at home for a period of 14 days and avoid close contact with public and other members in the family.
2. Guiding Principles for home care
 - a. Be informed about the illness.
 - b. Stay home, preferably isolate himself / herself in a separate & well-ventilated room.
 - c. Avoid common areas frequented by other members of the family.
 - d. Avoid close contact with others. If inevitable, always maintain at-least two meters distance.
 - e. Avoid having visitors.
 - f. Avoid frequent touching of face
 - g. Avoid hand shaking and wash hands frequently with soap and water. In case of non-availability of soap and water, commercially available hand rubs can be used
 - h. Take plenty of fluids.
 - i. Follow cough etiquettes
 - i. Cover mouth and nose with a tissue/ handkerchief when coughing or sneezing; In case tissue/handkerchief is not available cough/ sneeze onto your upper arm or shoulder; coughing/ sneezing directly onto hands should not be done.
 - ii. Turn away from others when coughing or sneezing
 - iii. Do not spit/blow nose here and there, use a water filled receptacle for collecting sputum, thereby minimizing aerosol generation.
3. In home quarantine, the person should occupy a well-ventilated single room, or if a single room is not possible, maintain a distance of at least 1 meter from other household members, minimizing the use of shared spaces and cutlery and ensuring that shared spaces (kitchen, bathroom) are well ventilated.
4. Monitor health for appearance of symptoms like fever, cough and/or breathing difficulty. If you develop any of these symptoms Please contact the nearest Government Health Facility.



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Chapter 09: Protocol for Quarantine at Quarantine Centre

1. Quarantine of persons is the restriction of activities or separation of persons who are not ill, but who may be exposed to COVID 19 disease, with the objective of monitoring symptoms and early detection of cases.
2. Quarantine is different from isolation, which is the separation of ill or infected persons from others, so as to prevent the spread of infection or contamination.
3. Quarantine implies the use or creation of appropriate facilities in which a person or persons are physically separated from the community while being attended to.
4. For the purpose of implementing quarantine, a contact is defined as a person:
 - i. Providing direct care without proper personal protective equipment (PPE) for COVID-19 patients;
 - ii. Staying in the same close environment of a COVID-19 patient (including workplace, classroom, household, gatherings);
 - iii. Traveling together in close proximity (within 1 meter) with a COVID-19 patient in any kind of conveyance within a 14-day period after the onset of symptoms in the case under consideration.
5. **Arrangements at Quarantine Centre:**
 - i. Those in quarantine be placed in adequately ventilated, spacious single rooms, with attached toilet (hand hygiene and toilet facilities). If single rooms are not available, beds should be placed at least 1 meter apart;
 - ii. Suitable environmental infection controls, such as adequate air ventilation, filtration systems and waste management protocols;
 - iii. Maintenance of social distancing (more than 1 meter) of the persons quarantined;
 - iv. Accommodation with an appropriate level of comfort, including:
 - a. Food, water and hygiene provisions;
 - b. Protection for baggage and other possessions;
 - c. Appropriate medical treatment for existing conditions;
 - d. Communication in a language that they can understand explaining: their rights; provisions that will be made available to them; how long they will need to stay; what will happen if they get sick; contact information of their local embassy or consular support;
 - e. Assistance for quarantined travelers, isolated or subject to medical examinations or other procedures for public health purposes;

- f. Assistance with communication with family members outside the quarantine facility;
 - g. If possible, access to the internet, news and entertainment;
 - h. Psychosocial support; and
 - i. Special considerations for older individuals and individuals with co-morbid conditions, due to their increased risk for severe COVID-19 disease.
6. Possible quarantine settings are hotels, dormitories, other facilities catering to groups, or the home of the contact. Regardless of the setting, an assessment must ensure that the appropriate conditions for safe and effective quarantine are being met.
7. When **home quarantine** is chosen, the person should occupy a well-ventilated single room, or if a single room is not possible, maintain a distance of at least 1 meter from other household members, minimizing the use of shared spaces and cutlery and ensuring that shared spaces (kitchen, bathroom) are well ventilated.

8. Infection prevention and control measures in Quarantine centres

The following infection prevention and control measures should be used to ensure a safe environment for quarantined persons.

i. Early recognition and control

- a. Any person in quarantine who develops febrile illness or respiratory symptoms, at any point during the quarantine period, should be treated and managed as a suspect COVID-19 case;
- b. Apply standard precautions for all persons quarantined and quarantine personnel:
 - 1. Perform hand hygiene frequently, particularly after contact with respiratory secretions, before eating and after using the toilet. Hand hygiene includes either cleaning hands with soap and water or with an alcohol-based hand rub. Alcohol-based hand rubs are preferred if hands are not visibly soiled; wash hands with soap and water when they are visibly soiled;
 - 2. Ensure that all persons quarantined are practicing respiratory hygiene, and are aware of the importance of covering their nose and mouth with a flexed elbow or paper tissue when coughing or sneezing and disposing immediately of the tissue and performing hand hygiene;
 - 3. Refrain from touching mouth and nose;
- c. A medical mask is not required for persons with no symptoms. There is no evidence that wearing a mask of any type protects people who are not sick.

ii. Administrative controls: Administrative controls and policies for IPC within quarantine facilities include, but may not be limited to:

- a. establishing sustainable IPC infrastructures (design of facility) and activities;
- b. educating persons quarantined and quarantine personnel about IPC;
- c. all personnel working in the quarantine facility need to have training on standard precautions before the quarantine measures are implemented.

- d. The same advice on standard precautions should be given to all quarantined persons on arrival.
 - e. Both personnel and quarantined persons should understand the importance of promptly seeking medical care if they develop symptoms;
 - f. Developing policies on the early recognition and referral of a suspect COVID-19 case.
- iii. Environmental controls:
- a. Environmental cleaning and disinfection procedures must be followed consistently and correctly.
 - b. Cleaning personnel need to be educated and protected from COVID-19 infection and ensure that environmental surfaces are regularly and thoroughly cleaned throughout the quarantine period:
 1. Clean and disinfect frequently touched surfaces such as bedside tables, bedframes, and other bedroom furniture daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water). For surfaces that do not tolerate bleach, 70% ethanol can be used;
 2. Clean and disinfect bathroom and toilet surfaces at least once daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water);
 3. Clean clothes, bedclothes, bath and hand towels, etc., using regular laundry soap and water or machine wash at 60–90 °C with common laundry detergent and dry thoroughly;
 4. Hospitals should consider measures to ensure that waste is disposed of in a sanitary landfill, and not in an unmonitored open area;
 5. Cleaning personnel should wear disposable gloves when cleaning or handling surfaces, clothing or linen soiled with body fluids, and should perform hand hygiene before and after removing gloves.
- 9. Minimum requirements for health monitoring of quarantined persons during the quarantine period**
- i. Daily follow-up of persons quarantined should be conducted within the quarantine facility for the duration of the quarantine and should include daily body temperature and symptom screening.
 - ii. Groups of persons at higher risk of infection and severe disease may require additional surveillance for chronic conditions or specific medical treatments.
 - iii. Consideration should be given to the resources, personnel and rest period of staff at quarantine facilities. This is particularly important in the context of an ongoing outbreak, during which limited public health resources may be better prioritised towards health care facilities and case-detection activities.
 - iv. Laboratory testing of a respiratory sample from quarantined persons, irrespective of symptoms, is advised at the end of the quarantine period.
10. Introducing quarantine measures early in an outbreak may delay the introduction of the

disease to an area and/or may delay the peak of an epidemic in an area where local transmission is ongoing. However, if not implemented properly, quarantine may also create additional sources of contamination and dissemination of the disease

11. Containment strategy includes the rapid identification of laboratory-confirmed cases, and their isolation and management in either a medical facility or at home.
12. For contacts of laboratory-confirmed cases, it is recommended that such persons be quarantined for 14 days from the last time they were exposed to a COVID-19 patient.



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Chapter 10: Protocol on Preparedness of Private Hospitals

1. Responsibilities of Private Hospitals
 - a. Follow the below guidelines on isolation, infection control and protection of personnel.
 - b. Immediately notify any suspected case to the District Medical & Health Officer and State Call Centre 0866 2410978
2. All private hospitals should be prepared for possible arrival of patients with COVID-19.
3. All private hospitals should ensure their staff are trained, equipped and capable of practices needed to:
 - a. Prevent the spread of respiratory diseases including COVID-19 within the facility.
 - b. Promptly identify and isolate patients with possible COVID-19 and inform the correct facility staff and public health authorities
 - c. Care for a limited number of patients with confirmed or suspected COVID-19 as part of routine operations
 - d. Potentially care for a larger number of patients in the context of an escalating outbreak
 - e. Monitor and manage any personnel that might be exposed to COVID-19
 - f. Communicate effectively within the facility and plan for appropriate external communication related to COVID-19.
 - g. Facility provides education and job-specific training to personnel regarding COVID-19 including:
 - Signs and symptoms of infection
 - How to safely collect a specimen
 - Correct infection control practices and personal protective equipment (PPE) use
 - Triage procedures including patient placement
 - Personnel sick leave policies and recommended actions for unprotected exposures (e.g., not using recommended PPE, an unrecognized infectious patient contact)
 - How and to whom COVID-19 cases should be reported

4. Process for rapidly identifying and isolating patients with confirmed or suspected COVID-19:

- a. Signs are posted at entrances with instructions to individuals with symptoms of respiratory infection to: immediately put on a mask and keep it on during their assessment, cover their mouth/nose when coughing or sneezing, use and dispose of tissues, and perform hand hygiene after contact with respiratory secretions.
- b. Facemasks are provided to coughing patients and other symptomatic individuals upon entry to the facility.
- c. Signs are posted in triage areas (e.g., ED entrances) advising patients with fever or symptoms of respiratory infection and recent travel outside India to immediately notify triage personnel so appropriate precautions can be put in place.
- d. Alcohol based hand sanitizer for hand hygiene is available at each entrance and in all common areas.
- e. Facility provides tissues and no-touch receptacles for disposal of tissues in waiting rooms and in common areas.
- f. Facility has a separate well-ventilated space that allows waiting patients to be separated by 6 or more feet, with easy access to respiratory hygiene and cough etiquette supplies.
- g. Facility has a process to ensure patients with confirmed or suspected COVID-19 are rapidly moved to an Airborne Infection Isolation Room (AIIR).
- h. Alternatively, for patients that cannot be immediately placed in a room for further evaluation, a system is provided that allows them to wait in a personal vehicle or outside the facility (if medically appropriate) and be notified by phone or other remote methods when it is their turn to be evaluated.
- i. Triage personnel are trained on appropriate processes (e.g., questions to ask and actions to take) to rapidly identify and isolate suspect cases.
- j. Facility has a process that occurs after a suspect case is identified to include immediate notification of facility leadership/infection control.
- k. Facility has a process to notify local or state health department of a suspect case soon after arrival.
- l. Facility has a process for receiving suspect cases arriving by ambulance.

5. Patient placement:

- a. Confirm the number and location of Airborne Infection Isolation Rooms (AIIRs) available in the facility (ideally AIIRs will be available in the emergency department and on inpatient units)
- b. Document that each AIIR has been tested and is effective (e.g., sufficient air exchanges, negative pressure, exhaust handling) within the last month. The AIIR should be checked for negative pressure before occupancy

- c. Verify each AIIR meets the following criteria:
 - Minimum of 6 air changes per hour (12 air changes per hour are recommended for new construction or renovation).
- d. Air from these rooms should be exhausted directly to the outside or be filtered through a high-efficiency particulate air (HEPA) filter before recirculation.
- e. Room doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized.
- f. When occupied by a patient, the AIIR is checked daily for negative pressure.
- g. A protocol is established, which specifies that aerosol-generating procedures that are likely to induce coughing (e.g., sputum induction, open suctioning of airways) are to be performed in an AIIR using appropriate PPE.
- h. Facility has plans to minimize the number of HCP who enter the room. Only essential personnel enter the AIIR. Facilities should consider caring for these patients with dedicated HCP to minimize risk of transmission and exposure to other patients and HCP.
- i. Facility has a process (e.g., a log, electronic tracking) for documenting HCP entering and exiting the patient room.
- j. Facility has policies for dedicating noncritical patient-care equipment to the patient.

6. Transmission-Based Precautions

- a. Personal protective equipment (PPE) and other infection prevention and control supplies (e.g., hand hygiene supplies) that would be used for both healthcare personnel (HCP) protection and source control for infected patients.
- b. Facility has a respiratory protection program. Appropriate HCP have been medically cleared, fit-tested, and trained for respirator use.
- c. HCP receive appropriate training, including “just in time” training on selection and proper use of (including putting on and removing) PPE, with a required demonstration of competency.
- d. Facility has a process for auditing adherence to recommended PPE use by HCP.

7. Movement of patients with confirmed or suspected COVID-19 within the facility

- a. Patient movement outside of the AIIR will be limited to medically-essential purposes.
- b. A protocol is in place to ensure that, if the patient is being transported outside of the room, HCP in the receiving area are notified in advance.
- c. Patients transported outside of their AIIR will be asked to wear a facemask and be covered with a clean sheet during transport.

8. Hand hygiene (HH)

- a. HH supplies, including alcohol-based hand sanitizer are readily accessible in

patient care areas, including areas where HCP remove PPE.

- b. Facility has a process for auditing adherence to recommended hand hygiene practices by HCP

9. Environmental cleaning

- a. Facility has a plan to ensure proper cleaning and disinfection of environmental surfaces and equipment in the patient room.
- b. If environmental services personnel are given this responsibility, they should be appropriately trained and fit-tested.
- c. All HCP with cleaning responsibilities understand the contact time for selected products.
- d. Facility has a process to ensure shared or non-dedicated equipment is cleaned and disinfected after use according to manufacturer's recommendations.
- e. Facility uses an EPA-registered hospital-grade disinfectant with EPA-approved emerging viral pathogens claims on hard non-porous surfaces.
- f. If there are no available EPA-registered products that have an approved emerging viral pathogen claim for COVID-19, products with label claims against human coronaviruses should be used according to label instructions.

10. Monitoring and managing Personnel

- a. The facility follows the local/state public health authority's policies and procedures for monitoring and managing HCP with potential for exposure to COVID-19, including ensuring that HCP have ready access, including via telephone, to medical consultation.
- b. Facility has a process to track exposures and conduct active- and/or self-monitoring of HCP if required by public health.
- c. Facility has a process to conduct symptom and temperature checks prior to the start of any shift of asymptomatic, exposed HCP that are not work restricted.

11. Visitor access and movement within the facility

- a. Plans for visitor access and movement within the facility have been reviewed and updated within the last 12 months.
- b. Visitors are screened for symptoms of acute respiratory illness before entering the hospital.
- c. Facility has a plan to restrict visitation to rooms of patients with confirmed or suspected COVID-19.
- d. If visitors are allowed to enter the room of a confirmed or suspected COVID-19 patient, the facility will enact a policy defining what PPE should be used by visitors.
- e. Provide instruction to visitors before they enter a patient room, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy
- f. Maintain a record (e.g., a log with contact information) of all visitors who enter

and exit the room.

- g. Ensure that visitors limit their movement within facility (e.g. avoid the cafeteria).



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Chapter 11: Protocol on Sanitization of Isolation Wards, Quarantine Centers and Places visited by Suspected/Confirmed Cases

1. Isolation Wards

- a. Cleaning and decontamination should only be performed by staff trained in the use of the appropriate PPE; in some instances, this may need to be trained clinical staff rather than domestic staff.
- b. After cleaning with neutral detergent, a chlorine-based disinfectant should be used, in the form of a solution at a minimum strength of 1,000ppm available chlorine. If an alternative disinfectant is used within the organization, the local IPCT should be consulted on this to ensure that this is effective against enveloped viruses.
- c. The main patient isolation room should be cleaned at least once a day, and following aerosol generating procedures or other potential contamination.
- d. There should be more frequent cleaning of commonly used hand-touched surfaces and of anteroom or lobby areas (at least twice per day).
- e. To ensure appropriate use of PPE and that an adequate level of cleaning, it is strongly recommended that cleaning of the isolation area is undertaken separately to the cleaning of other clinical areas.
- f. Dedicated or disposable equipment (such as mop heads, cloths) must be used for environmental decontamination.
- g. Reusable equipment (such as mop handles, buckets) must be decontaminated after use with a chlorine-based disinfectant as described above.
- h. Communal cleaning trollies should not enter the room.

2. Quarantine Centres

- a. Environmental cleaning and disinfection procedures must be followed consistently and correctly.

- b. Cleaning personnel need to be educated and protected from COVID-19 infection and ensure that environmental surfaces are regularly and thoroughly cleaned throughout the quarantine period.
- c. Clean and disinfect frequently touched surfaces such as bedside tables, bedframes, and other bedroom furniture daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water). For surfaces that do not tolerate bleach, 70% ethanol can be used;
- d. Clean and disinfect bathroom and toilet surfaces at least once daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water);
- e. Clean clothes, bedclothes, bath and hand towels, etc., using regular laundry soap and water or machine wash at 60–90 °C with common laundry detergent and dry thoroughly;
- f. Countries should consider measures to ensure that waste is disposed of in a sanitary landfill, and not in an unmonitored open area;
- g. Cleaning personnel should wear disposable gloves when cleaning or handling surfaces, clothing or linen soiled with body fluids, and should perform hand hygiene before and after removing gloves.



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Chapter 12: Protocol for Cluster Screening

I. Cluster Definition

1. A cluster is defined as 'an unusual aggregation of health events that are grouped together in time and space and that are reported to a health agency'. Clusters of human cases are formed when there is local transmission. The local transmission is defined as a laboratory confirmed case of COVID-19:
 - i. Who has not travelled from an area reporting confirmed cases of COVID-19 or
 - ii. Who had no exposure to a person travelling from COVID-19 affected area or other
 - iii. known exposure to an infected person
 - iv. There could be single or multiple foci of local transmission. \There may or may not be an epidemiological link to a travel related case

II. Cluster containment strategy

1. The main objective is to contain the disease within the geographical location with early identification and break the chain of transmission and spread to new areas.
2. This includes geographic quarantine, social distancing measures, enhanced active surveillance, testing all suspected cases, isolation of cases, home quarantine of contacts, social mobilization to follow preventive public health measures

III. Active Surveillance

1. The residential areas will be divided into sectors for the ASHAs/Anganwadi workers/ANMs each covering 50 households (30 households in difficult areas). Additional workforce would be mobilized from neighbouring districts (except buffer zone) to cover all the households in the containment zone. This workforce will have supervisory officers (PHC/CHC doctors) in the ratio of 1:4.
2. The field workers will be performing active house to house surveillance daily in the containment zone from 8:00 AM to 2:00 PM.
3. They will line list the family members and those having symptoms.

4. The field worker will provide a mask to the suspect case and to the care giver identified by the family.
5. The patient will be isolated at home till such time he/she is examined by the supervisory officer. They will also follow up contacts identified by the RRTs within the sector allocated to them.

IV. Passive surveillance

1. All health facilities in the containment zone will be listed as a part of mapping exercise.
2. All such facilities both in government and private sector (including clinics) shall report clinically suspect cases of COVID-19 on real time basis (including 'nil' reports) to the control room at the district level.

V. Contact Tracing

1. The contacts of the laboratory confirmed case/ suspect case of COVID-19 will be line-listed and tracked and kept under surveillance at home for 28 days (by the designated field worker).
2. The Supervisory officer in whose jurisdiction, the laboratory confirmed case/ suspect case falls shall inform the control room about all the contacts and their residential addresses.
3. The control room will in turn inform the supervisory officers of concerned sectors for surveillance of the contacts.
4. If the residential address of the contact is beyond the allotted sector, the district IDSP will inform the concerned supervisory officer/concerned District IDSP/State IDSP.
5. Health workers posted at the exit point will perform screening (e.g. interview travellers, measure temperature, record the place and duration of intended visit and keep complete record of intended place of stay).
6. Details of all persons moving out of perimeter zone for essential/ emergency services will be recorded and they will be followed up through IDSP.
7. All vehicles moving out of the perimeter control will be decontaminated with sodium hypochlorite (1%) solution.

VI. Application of Routine Practices and Additional Precautions

In addition to routine practices, health care staff at risk of exposure to an individual presenting with signs and symptoms and exposure criteria consistent with COVID-19 should follow contact and droplet precautions. This includes the appropriate selection and use of personal protective equipment:

1. Gloves to protect hands
2. Facial protection: surgical/procedural mask and eye protection, or face shield, or surgical/procedural mask with visor attachment.
3. Hand hygiene should be performed whenever indicated, paying particularly attention to during and after completion of screening.



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Chapter 13: Protocol for Cluster Screening

Cluster Containment:

Definition

1. A cluster is defined as 'an unusual aggregation of health events that are grouped together in time and space and that are reported to a health agency' (Source CDC). Clusters of human cases are formed when there is local transmission. The local transmission is defined as a laboratory confirmed case of COVID-19:
 - a. Who has not travelled from an area reporting confirmed cases of COVID-19 or
 - b. Who had no exposure to a person travelling from COVID-19 affected area or other
 - c. known exposure to an infected person
 - d. There could be single or multiple foci of local transmission. \There may or may not be an epidemiological link to a travel related case

Cluster containment strategy

2. The main objective is to contain the disease within the geographical location with early identification and break the chain of transmission and spread to new areas. This includes geographic quarantine, social distancing measures, enhanced active surveillance, testing all suspected cases, isolation of cases, home quarantine of contacts, social mobilization to follow preventive public health measures

Containment Zone

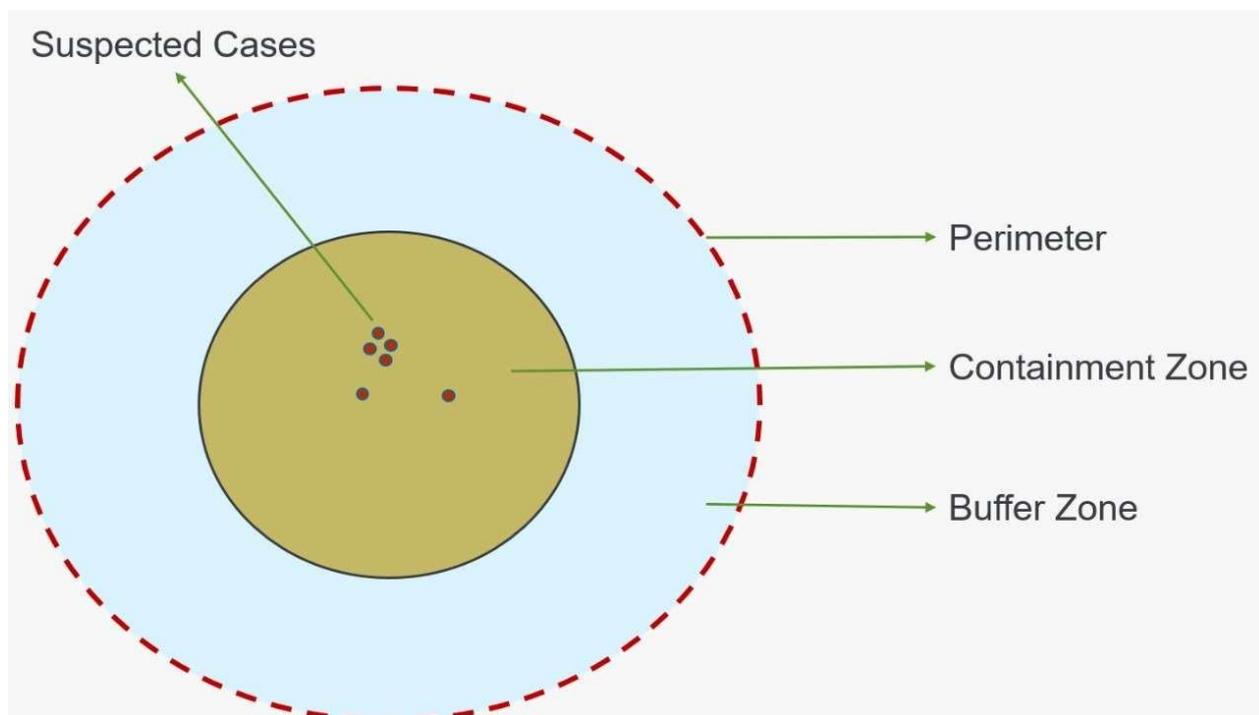
3. The containment zone will be defined based on:
 - a. The index case / cluster, which will be the designated epicenter
 - b. The listing and mapping of contacts.
 - c. Geographical distribution of cases and contacts around the epicenter.
 - d. Administrative boundaries within urban cities /town/ rural area.

4. Based on the geographical occurrence of the positive case containment zone is defined as follows:

S. No	Scenario	Containment Zone Characteristics
1	A small cluster in closed environment such as residential schools, military barracks, hostels or a hospital.	Containment zone will be determined by mapping of the persons in such institutions including cases and contacts. A buffer zone of additional 5 Km radius* will be identified.
2	Single cluster in a residential colony	Administrative boundary of the residential colony and a buffer zone of additional 5 Km radius
3	Multiple clusters in communities (residential colony, schools, offices, hospitals etc.) with in an administrative Jurisdiction	Administrative boundary of the urban district and a buffer zone of neighboring urban districts.
4	Multiple clusters spatially separated in different parts administrative districts of a city	Administrative boundary of city/ town and congruent population in the peri urban areas as the buffer zone
5	Cluster in a rural setting	3 Km radius of containment zone and additional 7 Kms radius of buffer zone.

5. Buffer Zone: Area around the containment zone, where new cases are most likely to appear.
6. Perimeter: Perimeter of the containment zone will be decided by the district administration based on criteria defined. Clear entry and exit points will be established.
7. The RRT will do listing of cases, contacts and their mapping. This will help in deciding the perimeter for action. The decision of the geographic limit and extent of perimeter control will be that of the state government

Diagram of containment zone



Surveillance in containment zone

Contact listing

1. The RRTs will list the contacts of the suspect / laboratory confirmed case of COVID-19. The District Surveillance Officer along with the RRT will map the contacts to determine the potential spread of the disease. If the residential address of the contact is beyond that district, the district IDSP will inform the concerned District IDSP/State IDSP.

Mapping of the containment and buffer zones

2. The containment and buffer zones will be mapped to identify the health facilities (both government and private) and health workforce available (primary healthcare workers, Anganwadi workers and doctors in PHCs/CHCs/District hospitals).

Active Surveillance

3. The residential areas will be divided into sectors for the ASHAs/Anganwadi workers/ANMs each covering 50 households (30 households in difficult areas). Additional workforce would be mobilized from neighboring districts (except buffer zone) to cover all the households in the containment zone. This workforce will have supervisory officers (PHC/CHC doctors) in the ratio of 1:4.
4. The field workers will be performing active house to house surveillance daily in the containment zone from 8:00 AM to 2:00 PM. They will line list the family

members and those having symptoms. The field worker will provide a mask to the suspect case and to the care giver identified by the family. The patient will be isolated at home till such time he/she is examined by the supervisory officer. They will also follow up contacts identified by the RRTs within the sector allocated to them.

Passive surveillance

5. All health facilities in the containment zone will be listed as a part of mapping exercise. All such facilities both in government and private sector (including clinics) shall report clinically suspect cases of COVID-19 on real time basis (including 'Nil' reports) to the control room at the district level.

Contact Tracing

6. The contacts of the laboratory confirmed case/ suspect case of COVID-19 will be line-listed and tracked and kept under surveillance at home for 28 days (by the designated field worker). The Supervisory officer in whose jurisdiction, the laboratory confirmed case/ suspect case falls shall inform the Control Room about all the contacts and their residential addresses. The control room will in turn inform the supervisory officers of concerned sectors for surveillance of the contacts. If the residential address of the contact is beyond the allotted sector, the district IDSP will inform the concerned Supervisory officer/concerned District IDSP/State IDSP.
7. The surveillance activities to be followed in the buffer zone are as follows:
 - a. Review of ILI/SARI cases reported in the last 14 days by the district health Official to identify any missed case of COVID-19 in the community.
 - b. Enhanced passive surveillance for ILI and SARI cases in the buffer zone through the existing Integrated Disease Surveillance Programme.
 - c. In case of any identified case of ILI/SARI, sample should be collected and sent to the designated laboratories for testing COVID-19.

Perimeter control

8. The perimeter control will ensure that there is no unchecked outward movement of population from the containment zone except for maintaining essential services (including medical emergencies) and government business continuity. It will also limit unchecked influx of population into the containment zone. The authorities at these entry points will be required to inform the incoming travelers about precautions to be taken and will also provide such travelers with an information pamphlet and mask.
9. All vehicular movement, movement of public transport and personnel movement will be restricted. All roads including rural roads connecting the containment zone will be guarded by police.
10. The District administration will post signs and create awareness informing public about the perimeter control. Health workers posted at the exit point will perform screening (e.g. interview travelers, measure temperature, record the place and duration of intended visit and keep complete record of intended place of stay). Details of all persons moving out of perimeter zone for essential/ emergency services will be

recorded and they will be followed up through IDSP. All vehicles moving out of the perimeter control will be decontaminated with sodium hypochlorite (1%) solution.

Control room in the containment zone

11. A control room shall be set up inside the containment zone to facilitate collection, collation and dissemination of data from various field units to District and State control rooms. This shall be manned by an epidemiologist under which data managers (deployed from IDSP/ NHM) will be responsible for collecting, collating and analyzing data from field and health facilities. This control room will provide daily input to the District control room for preparation of daily situation report.



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Chapter 14: Protocol for Dead body management

Scope of the document

This guideline is based on the current epidemiological knowledge about the COVID-19. At this stage, all suspect/ confirmed cases will be isolated in a health care facility. Hence the document is limited in scope to hospital deaths. The main driver of transmission of COVID-19 is through droplets. There is unlikely to be an increased risk of COVID infection from a dead body to health workers or family members who follow standard precautions while handling body. Only the lungs of dead COVID patients, if handled during an autopsy, can be infectious.

Standard Precautions to be followed by health care workers while handling dead bodies of COVID.

Standard infection prevention control practices should be followed at all times.

Removal of the body from the isolation room or area

- The health worker attending to the dead body should perform hand hygiene, ensure proper use of PPE (water resistant apron, goggles, N95 mask, gloves). All tubes, drains and catheters on the dead body should be removed.
- Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) should be disinfected with 1% hypochlorite and dressed with impermeable material.
- Apply caution while handling sharps such as intravenous catheters and other sharp devices. They should be disposed into a sharps container.
- Plug Oral, nasal orifices of the dead body to prevent leakage of body fluids.
- If the family of the patient wishes to view the body at the time of removal from the isolation room or area, they may be allowed to do so with the application of Standard Precautions.
- Place the dead body in leak-proof plastic body bag. The exterior of the body bag can be decontaminated with 1% hypochlorite.
- The body bag can be wrapped with a mortuary sheet or sheet provided by the family members.
- The body will be either handed over to the relatives or taken to mortuary.
- All used/ soiled linen should be handled with standard precautions, put in bio-hazard bag and the outer surface of the bag disinfected with hypochlorite solution.

- Used equipment should be autoclaved or decontaminated with disinfectant solutions in accordance with established infection prevention control practices.
- All medical waste must be handled and disposed of in accordance with Bio-medical waste management rules.
- The health staff who handled the body will remove personal protective equipment and will perform hand hygiene.
- Provide counselling to the family members and respect their sentiments.

Environmental cleaning and disinfection

- All surfaces of the isolation area (floors, bed, railings, side tables, IV stand, etc.) should be wiped with 1% Sodium Hypochlorite solution; allow a contact time of 30 minutes, and then allowed to air dry.

Handling of dead body in Mortuary

- Mortuary staff handling COVID dead body should observe standard precautions.
- Dead bodies should be stored in cold chambers maintained at approximately 4°C.
- The mortuary must be kept clean. Environmental surfaces, instruments and transport trolleys should be properly disinfected with 1% Hypochlorite solution.
- After removing the body, the chamber door, handles and floor should be cleaned with sodium hypochlorite 1% solution.

Embalming

- Embalming of dead body should not be allowed.

Autopsies on COVID-19 dead bodies

Autopsies should be avoided. If autopsy is to be performed for special reasons, the following infection prevention control practices should be adopted:

- The team should be well trained in infection prevention control practices.
- The number of forensic experts and support staff in the autopsy room should be limited.
- The team should use full complement of PPE (coveralls, head cover, shoe cover, N 95 mask, goggles / face shield).
- Round ended scissors should be used
- PM40 or any other heavy duty blades with blunted points to be used to reduce prick injuries
- Only one body cavity at a time should be dissected
- Unfixed organs must be held firm on the table and sliced with a sponge – care should be taken to protect the hand
- Negative pressure to be maintained in mortuary. An oscillator saw with suction extraction of the bone aerosol into a removable chamber should be used for sawing

skull, otherwise a hand saw with a chain-mail glove may be used

- Needles should not be re-sheathed after fluid sampling – needles and syringes should be placed in a sharps bucket.
- Reduce aerosol generation during autopsy using appropriate techniques especially while handling lung tissue.
- After the procedure, body should be disinfected with 1% Sodium Hypochlorite and placed in a body bag, the exterior of which will again be decontaminated with 1% Sodium Hypochlorite solution.
- The body thereafter can be handed over to the relatives.
- Autopsy table to be disinfected as per standard protocol.

Transportation

- The body, secured in a body bag, exterior of which is decontaminated poses no additional risk to the staff transporting the dead body.
- The personnel handling the body may follow standard precautions (surgical mask, gloves).
- The vehicle, after the transfer of the body to cremation/ burial staff, will be decontaminated with 1% Sodium Hypochlorite.

At the crematorium/ Burial Ground

- The Crematorium/ burial ground staff should be sensitized that COVID 19 does not pose additional risk.
- The staff will practice standard precautions of hand hygiene, use of masks and gloves.
- Viewing of the dead body by unzipping the face end of the body bag (by the staff using standard precautions) may be allowed, for the relatives to see the body for one last time.
- Religious rituals such as reading from religious scripts, sprinkling holy water and any other last rites that does not require touching of the body can be allowed.
- Bathing, kissing, hugging, etc. of the dead body should not be allowed.

Annexure-A - Testing Labs

COVID -19 Testing Sites (62)		
State/UT		LIST OF VRDLs
Andhra Pradesh	1.	Sri Venkateswara Institute of Medical Sciences, Tirupati
	2.	Rangaraya Medical College, Kakinada
	3.	Sidhartha Medical College, Vijayawada
	4.	GMC, Anantapur, AP
Andaman & Nicobar islands	5.	Regional Medical Research Centre, Port Blair, Andaman and Nicobar
Assam	6.	Gauhati Medical College, Guwahati
	7.	Regional Medical Research Center, Dibrugarh
	8.	Silchar Medical College, Silchar
	9.	Jorhat Medical College, Jorhat
Bihar	10.	Rajendra Memorial Research Institute of Medical Sciences, Patna
Chandigarh	11.	Post Graduate Institute of Medical Education & Research, Chandigarh
Chhattisgarh	12.	All India Institute Medical Sciences, Raipur
Delhi-NCT	13.	All India Institute Medical Sciences, Delhi
Gujarat	14.	BJ Medical College, Ahmedabad
	15.	M.P.Shah Government Medical College, Jamnagar
Haryana	16.	Pt. B.D. Sharma Post Graduate Inst. of Med. Sciences, Rohtak, Haryana
	17.	BPS Govt Medical College, Sonipat
Himachal Pradesh	18.	Indira Gandhi Medical College, Shimla, Himachal Pradesh
	19.	Dr.Rajendra Prasad Govt. Med. College, Kangra, Tanda, HP
Jammu and Kashmir	20.	Sher-e- Kashmir Institute of Medical Sciences, Srinagar
	21.	Government Medical College, Jammu
	22.	Government Medical College, Srinagar
Jharkhand	23.	MGM Medical College, Jamshedpur
Karnataka	24.	Bangalore Medical College & Research Institute, Bangalore
	25.	National Institute of Virology Field Unit Bangalore
	26.	Mysore Medical College & Research Institute, Mysore
	27.	Hassan Inst. of Med. Sciences, Hassan, Karnataka
	28.	Shimoga Inst. of Med. Sciences, Shivamogga, Karnataka
Kerala	29.	National Institute of Virology Field Unit, Kerala
	30.	Govt. Medical College, Thriuvananthapuram, Kerala
	31.	Govt. Medical College, Kozhikhode, Kerala
	32.	Govt. Medical College, Thrissur
Madhya Pradesh	33.	All India Institute Medical Sciences, Bhopal
	34.	National Institute of Research in Tribal Health (NIRTH), Jabalpur

Meghalaya	35.	NEIGRI of Health and Medical Sciences, Shillong, Meghalaya
Maharashtra	36.	Indira Gandhi Government Medical College, Nagpur
	37.	Kasturba Hospital for Infectious Diseases, Mumbai
	38.	NIV Mumbai Unit
Manipur	39.	J N Inst. of Med. Sciences Hospital, Imphal-East, Manipur
	40.	Regional Institute of Medical Sciences, Imphal
Odisha	41.	Regional Medical Research Center, Bhubaneswar
Puducherry	42.	Jawaharlal Institute of Postgraduate Medical Education & Research, Puducherry
Punjab	43.	Government Medical College, Patiala, Punjab
	44.	Government Medical College, Amritsar
Rajasthan	45.	Sawai Man Singh, Jaipur
	46.	Dr. S.N Medical College, Jodhpur
	47.	Jhalawar Medical College, Jhalawar, Rajasthan
	48.	RNT Medical College, Udaipur
	49.	SP Med. College, Bikaner, Rajasthan
Tamil Nadu	50.	King's Institute of Preventive Medicine & Research, Chennai
	51.	Government Medical College, Theni
	52.	Tirunelveli Medical College, Tirunelveli
	53.	Govt. Medical college, Thiruvarur
Tripura	54.	Government Medical College, Agartala
Telangana	55.	Gandhi Medical College, Secunderabad
	56.	Osmania Medical College, Hyderabad
Uttar Pradesh	57.	King's George Medical University, Lucknow
	58.	Institute of Medical Sciences, Banaras Hindu University, Varanasi
	59.	Jawaharlal Nehru Medical College, Aligarh
Uttarakhand	60.	Government Medical College, Haldwani
West Bengal	61.	National Institute of Cholera and Enteric Diseases, Kolkata
	62.	IPGMER, Kolkata
National	63.	National Centre of Disease Control, New Delhi

Labs scheduled to be functional shortly(9)

State/UT		LIST OF VRDLs
Bihar	1.	Darbhanga Medical College, Darbhanga
Chhattisgarh	2.	Late Sri Baliram Kashyap Memorial Govt. Medical College, Jagdalpur
Delhi-NCT	3.	Lady Hardinge Medical College, New Delhi
	4.	Army Hospital (R&R), New Delhi
Jammu & Kashmir	5.	Command Hospital, Udhampur
Karnataka	6.	Command Hospital, Bangaluru
Maharashtra	7.	Armed Forces Medical College, Pune
Tamil Nadu	8.	Madras Medical College, Chennai
Uttar Pradesh	9.	Command Hospital, Lucknow