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No. 8611

Date 20.03.2020

HFWD-SCH-I-EMER-0001-2020

To

All Deans & Principals and Superintendents of Medical Colleges & Hospital
All Directors Health and Family Welfare Department, Odisha
All Chief District Medical and Public Health Officers, Odisha

Sub: **Technical guidelines for quarantine, isolation and treatment for effective COVID-19 response**

Sir/ Madam,

As you are aware that Corona Virus Disease (COVID-19) which is caused by a new Virus (SARS-CoV-2), first appeared in Wuhan city of Hubei province of China in December 2019. By 17th March this disease has affected 167 countries including India. Looking at the severity of the situation, World Health Organization (WHO) has declared this as Pandemic.

Government of Odisha has initiated various preventive measures to keep the virus at bay. The State has framed, **COVID-19 Regulations 2020**, exercising the powers conferred under section 2,3 & 4 of Epidemic Disease Act, 1897 for effective prevention & containment of the outbreak.

It is necessary to interrupt human-to-human transmission, identify, isolate and care patients early and to reduce the impact of the outbreak. I am enclosing the "Technical guidelines for quarantine, isolation and treatment for effective COVID-19 response". While sharing this to all of you, I request you to go through it meticulously and ensure compliance of the same by all concerned.

Yours faithfully,

19/3/2020
(Nikunja B.Dhal)

86/2

20.03.2020

Copy to

1. Chief Secretary, Odisha / DC-cum- ACS for kind information
2. Mission Director, NHM, Odisha for information and necessary action.
3. All Collectors and District Magistrates for information and necessary action.
4. Copy to ME-II Section for circulation among private health care providers.
5. Team Leader, WHO, Odisha for information .

19/3/2020

(Nikunja B. Dhal)

Copy to

86/3

20.03.2020

Director, AIIMS, Bhubaneswar / Sr. Regional Director, Ministry of Health & Family Welfare, Government of India, Bhubaneswar.

19/3/2020

(Nikunja B. Dhal)

Technical guidelines for quarantine, isolation and treatment of COVID-19

COVID-19 is caused by SARS COV-2 virus first detected in Wuhan city of Hubei province in China on 31.12.2019. It belongs to same family of viruses of like SARS and MERS. The virulence is relatively less with very high infection rate. Certain cases could be fatal. The main mode of transmission is through droplet infection and fomites. On March 5, WHO declared it as Global Pandemic.

Till now, no prophylactic vaccine or effective antiviral drug has been developed. So the mainstay of management is prevention and containment of the disease. For effective management of COVID-19 the following protocol should be followed for quarantine, isolation and treatment.

(I) CATEGORIES OF PERSONS WHO REQUIRE QUARANTINE, ISOLATION AND TREATMENT

A. QUARANTINE

It may be home quarantine or facility level quarantine.

a. Home Quarantine

It is required for the following categories of persons:

- (i) Persons with travel history abroad in the last 14 days, but asymptomatic or with very mild symptoms.
- (ii) Persons with contact history with affected person in the last 14 days but asymptomatic or with very mild symptoms.
- (iii) Persons with no travel history or contact history, but having flu-like symptoms.

The protocol for home quarantine is at **Annexure-I**.

Persons violating home quarantine shall be dealt appropriately by the local authorities.

b. Facility-level quarantine is required for the following categories of persons:-

- (i) Persons with travel history abroad in the last 14 days and showing moderate or severe flu-like symptoms.
- (ii) Persons with contact history with affected persons in last 14 days and showing moderate or severe flu-like symptoms.

The protocol for facility-level quarantine is at **Annexure-II**

B. ISOLATION & TREATMENT

It is at facility-level for the following categories of persons:-

- (i) Those confirmed to be Covid-19 positive.
- (ii) Close contacts (parents, spouse, children, siblings, home staff etc.) of confirmed cases.

The protocol for facility-level isolation & treatment has been detailed by Govt. of India as at **Annexure III & IV.**

(II) IDENTIFICATION OF SUSPECT CASES FOR QUARANTINE

Suspect cases for quarantine are to be identified through the following means:-

- (i) Self registration of persons with travel history abroad or contact history with affected persons in the last 14 days, with 104 Health Helpline or www.covid19.odisha.gov.in portal.
- (ii) Persons calling District Help lines and reporting travel / contact history.
- (iii) Persons screened at airport and recommended for home/ facility quarantine, due to travel / contact history.
- (iv) Persons whose travel abroad details have been shared by the Bureau of Immigration.
- (v) Persons identified with travel/contact history through third parties i.e police, hotels, neighbours / public / private hospitals, etc.

In all such cases of reporting of suspect persons, the prescribed protocol to be adhered to for follow-up.

(III) GUIDELINES FOR CONTACT TRACING

A. Definition of a Contact

A contact is the person who is involved in direct care without proper personal protective equipment for CoVID-19 patients OR staying in the same close environment of a COVID-19 patient and traveling together in close proximity (<1m) with a symptomatic person who later tested positive for COVID -19 OR Family member who was handling the clothes or articles used by the confirmed case.

B. Essentials steps of Contact Tracing

- The state/district control room need to get the complete list of the contacts as soon as possible
- To trace out the current address of residence of contacts with land mark within 24 hours of getting the list
- If the address of residence of any contact is other states of the country they should be cross notified to the concerned authority of that state with a copy to NCDC, Director Public Health.

- For contacts who travelled to other country the list with address needs to be shared with NCDC by State IDSP cell with a copy to Team leader WHO.
- For the cases residing within the state the address should be shared to the concerned district and block officials maximum within 48 Hours

C. Interview and Follow up of identified contacts

- Standard Questionnaire for first time interview of contacts is at **Appendix A**. All contacts should be followed up as per the prescribed protocol.

(IV) PROTOCOL FOR FOLLOW-UP OF HOME QUARANTINE CASES

All persons advised home quarantine are to be followed up to ascertain their health status, provide them medical advice if needed and to find out whether home quarantine guidelines are being followed by them or not.

All persons identified for home quarantine are to be followed up as below:-

- (i) Follow-up calls to be made twice daily once between 8.00AM - 12.00 Noon and one between 5.00 PM – 8.00 PM and questions asked as per the Standard Questionnaire at **Appendix- B**.
- (ii) If the person is asymptomatic, then Standard Advisory to be given to them (daily) as per **Appendix-C**. The advisory may be communicated through human interface or Robo calls.
- (iii) If the person has symptoms, a doctor is to call him/ her within 2 hours and decide on continuation of home quarantine or shifting to facility level quarantine / isolation, depending on the patient's history and severity of symptoms.
- (iv) For persons who have been identified as suspect cases at district level, the follow up calls will be made by the district team. Critical cases should be referred to State Surveillance Unit.
- (v) For persons who have been identified as suspect cases at state level (104, portal, airport, State Control Room) the follow-up calls will be made by the state level Outgoing Call Centre.
- (vi) All cases who develop COVID-19 like symptoms and cases who have violated home quarantine guidelines are to be reported by the Outgoing Call Centre to the State Control Room of Health & F.W Deptt, for follow up by doctor, and if necessary, to bring to a government quarantine/ isolation facility.

- (vii) The prescribed safety protocol will be followed by the Rapid Response Teams / Monitoring Teams while transporting the suspect to the quarantine/ isolation facility.
- (viii) The follow-up calls and their findings of compliance to quarantine guidelines, development of symptoms (if any) will be recorded online on the portal.

(V) STATE/ DISTRICT LEVEL RESPONSE TEAMS

To enable quick and efficient contact tracing and follow-up of suspect cases, state health team & district health teams to be equipped with the following :-

1. A team of trained persons for making follow-up calls
2. Adequate telephone lines for follow-up calls (at least 3 land lines)
3. A panel of doctors for advising all symptomatic cases.
4. Adequate number of vehicles and ambulances for transport of suspect/ confirmed cases, to be requisitioned by the Collector.
5. State level and District Level Nodal officers for follow up calls.
6. State and District Teams will make ready adequate number of Monitoring Teams (consisting of a vehicle with driver, one male health worker/ Ayush doctor/ Volunteer and one female health worker/ Ayush doctor/ Volunteer). Collectors will requisition the required vehicles (with front shield labeling) and train the identified manpower.
7. The Monitoring Teams will be deployed for contact tracing as per need and surprise home visits to persons advised home quarantine.

PROTOCOL FOR HOME QUARANTINE

Any person(s) suggestive of COVID-19, should be confined at home for a period of 14 days and avoid close contact with public and other members in the family.

Guiding Principles for Home Quarantine

1. Stay home, isolated in a separate and well ventilated room with separate bathroom. Avoid common areas frequented by other members of the family.
2. Avoid close contact with others. If inevitable, always maintain at least one metre distance.
3. Avoid all visitors.
4. Avoid frequent touching of face.
5. Cover mouth and nose with flexed elbow, tissue/ handkerchief when coughing or sneezing.
6. Wash hands frequently with soap and water.
7. Do not share household items, utensils or bedding with other people at home.
8. Clean and disinfect floor and surfaces in quarantine room daily with bleach/ disinfectant.
9. Used linen, clothes and towels should be washed, disinfected and sun-dried before next use.
10. Soap and water should be at the room entrance to be used for hand washing by the care-givers.
11. Take plenty of fluids and have nutritious food.

Monitor your health symptoms like fever, cough and/ or breathing difficulty. If you develop any of these symptoms, please call Health Helpline 104.

PROTOCOL FOR FACILITY LEVEL QUARANTINE

A **quarantine** is the restriction on the movement of people and goods which is intended to prevent the spread of disease. It is often used in connection to disease and illness, preventing the movement of those who may have been exposed to a communicable disease, but do not have a confirmed medical diagnosis. Quarantine is used for people who are not sick and is similar to, but not the same as, isolation, which is used when a person is sick.

In view of the present COVID-19 epidemic one may need quarantine upon arrival due to risk related to new Corona Virus COVID-19. Typically a COVID-19 related quarantine last for 14 days period from the departure from the affected area, but is determined by the local health department.

SOP for creation of quarantine at facility level :

1. The place is to be identified, designated and notified by the District Collector/Municipality Commissioner/Sub-collector/BDOs of the area.
2. Overall in-charge : As will be authorised by the District Collector/ Municipality Commissioner/Sub-collector/BDOs of the area, preferably a facility manager is to be appointed.
3. Adequate security arrangement must be provided through outsourcing, which will be monitored by the local police. If required, the District administration can co-opt for provision of the additional police security.
4. Adequate numbers of supporting staff, like Room attendants, Sanitation workers, etc. are to be provided.
5. A Multipurpose health worker (Male/Female) or AYUSH doctor will be available shift-wise to monitor the health conditions. They will counsel each person at the time of admission into the quarantine home. The facility manager will maintain a stock of common drugs & consumables to be utilised by the MPHW/AYUSH doctor, in consultation with local doctors.

Provision:

1. Preferably single room for each person with attached toilet.
2. If attached toilet will not be available, common toilet can be used; but must be cleaned after each use.
3. Water supply, electricity/back up must be available 24X7.
4. Required manpower for sanitation, security, laundry, diet, waste management and patient attendant service may be outsourced through empanelled agency.
5. Strict sanitation practice must be followed as per guideline.
6. Biomedical waste disposal should be done as per the protocol.

7. On arrival the person must be registered, detailed history including history of travel & contacts must be recorded. The contact number of the persons as well as the relative who can be contacted must also be recorded.
8. To make his/her stay more enjoyable, he/she should be advised to have enough clean and comfortable clothes, cell phone, laptop, toiletry kit.
9. Hand washing facility must be available at the entrance.
10. Health care supplies to be ensured as follows:
 - In addition to personal items, the following supplies are to be provided during the time of quarantine.
 - Digital thermometer (for daily use)
 - Temperature & symptom log
 - Water bottle (stay hydrated)
 - Soap
 - Utensils
11. Face masks (should be available) to wear if in a shared space, or to a health care appointment if needed. Adequate amount of PPEs must be kept in reserve for use, if required for attending persons, who develop symptoms and transportation.
12. Transport facilities for persons who develop symptom during quarantine to the isolation facility must be available in coordination with CDM&PHO.
13. No guest or outsiders except authorised persons/service providers will be allowed to enter the centre.
14. The person quarantined will also not be allowed to leave the premises unless it is required.

Appendix-A

Questionnaire to interview the contacts of COVID-19 cases

Introduce yourself and the purpose of telephonic call

1. Inform him/ her, You are exposed to COVID-19 confirmed case and stand a chance of getting infected. We would take few information, which is very important and is required for your good health
2. Where are you currently staying, complete address with land mark and additional contact number in case your number will not be reachable?
3. Have you developed any symptoms like fever, cough or breathing difficulty? If so since when you have developed it
4. You need to stay in house and don't come in contact with other persons
5. If you are working, inform your authority that you can't go to the workplace. This is as per the Government of Odisha's mandate.
6. You will be called 2-3 times a day by health department to know your health status, you should positively attend the call and provide correct information to them. This will help to take care of your health in a better way
7. Do you know any person who has travelled from abroad.
8. Do you know any person who is having fever with cough/ breathing difficulty
9. Inform that, if he/she develops symptoms of COVID -19, he/she should proactively inform and contact the local authorities for isolation and testing.
10. He/she should not visit health facility without prior information to district officials.

Appendix-B

Standard Questionnaire for Follow up of Individuals under Home Quarantine

1. What is your current location?
 - a. In the designated room
 - b. In house but in other room
 - c. Outside of house (specify)_____
2. Are you strictly following the home quarantine? (Confined in home and not coming in close contact with anyone of family member or outsider) procedure?
 - a. Yes b. No c. Don't know
3. Did you visit outside of your designated room for any specific purpose?
 - a. Yes b. No

Details of the place visited_____,

Name of the people met during the visit_____ (with number)_____
4. Did you meet any person who visited you? Did s/he come in contact with you i.e. touching/ coming closer than one meter?
 - a. Yes b. No

Name of the people met during the visit_____ (with number)_____
5. Have you developed any health problems?
 - a. Sore
 - b. Fever with cough
 - c. Breathing difficulty
 - d. Other specify_____

Appendix-C

Standard Advisory for Individuals under Home Quarantine

- a. Home quarantine is an effective method to prevent the spread of COVID-19 from one person to other
- b. You should strictly confine yourself in a well ventilated room with separate dedicated toilet for you. Avoid using common areas and facilities.
- c. Ensure that no other person should touch clothes and other personal belongings used by you
- d. Avoid outside visitors. Maintain more than one meter distance from your care giver
- e. Practice frequent handwashing and cover your you face during cough/ sneezing with fold of elbow/ handkerchief/ tissue paper
- f. Take plenty of fluids and report to **104 Helpline number** in case of any health problem (fever, cough or breathing difficulty)
- g. After 14 days quarantine period is over, monitor your health for another 14 days and do report to **104 Helpline number** if you develop fever or cough or breathing difficulties



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COVID -19 Outbreak

Guidelines for Setting up

Isolation Facility/Ward

National Centre for Disease Control

22 Sham Nath Marg, Delhi 110054

Directorate General of Health Services

Ministry of Health and Family Welfare

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WHO has declared the COVID-19 (SARS-CoV-2) outbreak as Public Health Emergency of international concern and has raised the risk assessment of China, Regional Level and Global Level to Very High and “all countries should be prepared for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of SARS-CoV-2 infection. Among the factors affecting cluster containment, Isolation of cases and quarantine of contacts is the mainstay of outbreak containment.

Scope of document: This guidance document has been prepared to establish an isolation facility at the level of district hospital, a secondary health care facility.

A. Quarantine and isolation

Quarantine and Isolation are important mainstay of cluster containment. These measures help by breaking the chain of transmission in the community.

Quarantine

Quarantine refers to separation of individuals who are not yet ill but have been exposed to COVID-19 and therefore have a potential to become ill. There will be voluntary home quarantine of contacts of suspect /confirmed cases. The guideline on home quarantine available on the website of the Ministry provides detail guidance on home quarantine.

Isolation refers to separation of individuals who are ill and suspected or confirmed of COVID-19. All suspect cases detected in the containment/buffer zones (till a diagnosis is made), will be hospitalized and kept in isolation in a designated facility till such time they are tested negative. Persons testing positive for COVID-19 will remain to be hospitalized till such time 2 of their samples are tested negative as per MoHFW's discharge policy. About 15% of the patients are likely to develop pneumonia, 5 % of whom requires ventilator management.

Hence dedicated Intensive care beds need to be identified earmarked. Some among them may progress to multi organ failure and hence critical care facility/ dialysis facility/ and Salvage therapy [Extra Corporeal Membrane Oxygenator (ECMO)] facility for managing the respiratory/renal complications/ multi-organ failure shall be required. If such facilities are not available in the containment zone, nearest tertiary care facility in Government / private sector needs to be identified, that becomes a part of the micro-plan.

There are various modalities of isolating a patient. Ideally, patients can be isolated in individual isolation rooms or negative pressure rooms with 12 or more air-changes per hour.

In resource constrained settings, all positive COVID-19 cases can be cohorted in a ward with good ventilation. Similarly, all suspect cases should also be cohorted in a separate

ward. However under no circumstances these cases should be mixed up. A minimum distance of 1 meter needs to be maintained between adjacent beds. All such patients need to wear a triple layer surgical mask at all times.

Nosocomial infection in fellow patients and attending healthcare personnel are well documented in the current COVID-19 outbreak as well. There shall be strict adherence to Infection prevention control practices in all health facilities. IPC committees would be formed (if not already in place) with the mandate to ensure that all healthcare personnel are well aware of IPC practices and suitable arrangements for requisite PPE and other logistic (hand sanitizer, soap, water etc.) are in place. The designated hospitals will ensure that all healthcare staff is trained in washing of hands, respiratory etiquettes, donning/doffing & proper disposal of PPEs and bio-medical waste management.

At all times doctors, nurses and para-medics working in the clinical areas will wear three layered surgical mask and gloves. The medical personnel working in isolation and critical care facilities will wear full complement of PPE (including N95 masks).

The support staff engaged in cleaning and disinfection will also wear full complement of PPE. Environmental cleaning should be done twice daily and consist of damp dusting and floor mopping with Lysol or other phenolic disinfectants and cleaning of surfaces with sodium hypochlorite solution. Detailed guidelines available on MoHFW's website may be followed.

B. Setting up isolation facility/ward

An isolation facility aims to control the airflow in the room so that the number of airborne infectious particles is reduced to a level that ensures cross-infection of other people within a healthcare facility is highly unlikely.

- At State level, a minimum of **50** bed isolation ward should be established.
- At District level, a minimum of **10** bed isolation ward should be established.
 - Post signages on the door indicating that the space is an isolation area.
 - Remove all non-essential furniture and ensure that the remaining furniture is easy to clean, and does not conceal or retain dirt or moisture within or around it.
 - COVID-19 patients should be housed in single rooms.
 - However, if sufficient single rooms are not available, beds could be put with a spatial separation of at least 1 meter (3 feet) from one another.
 - To create a 10 bed facility, a minimum space of 2000 sq. feet area clearly segregated from other patientcare areas is required.
 - Preferably the isolation ward should have a separate entry/exit and should not be co-located with post-surgical wards/dialysis unit/SNCU/labour room etc.
 - It should be in a segregated area which is not frequented by outsiders.
 - The access to isolation ward should be through dedicated lift/guarded stairs.

- There should be double door entry with changing room and nursing station. Enough PPE should be available in the changing room with waste disposal bins to collect used PPEs. Used PPEs should be disposed as per the BMW guidelines.
- Stock the PPE supply and linen outside the isolation room or area (e.g. in the change room). Setup a trolley outside the door to hold PPE. A checklist may be useful to ensure that all equipment is available.
- Place appropriate waste bags in a bin. If possible, use a touch-free bin. Ensure that used (i.e. dirty) bins remain inside the isolation rooms.
- Place a puncture-proof container for sharps disposal inside the isolation room/area and bio-medical waste should be managed as per the BMW guidelines.
- Keep the patient's personal belongings to a minimum. Keep water pitchers and cups, tissue wipes, and all items necessary for attending to personal hygiene within the patient's reach.
- Non-critical patient-care equipment (e.g. stethoscope, thermometer, blood pressure cuff, and sphygmomanometer) should be dedicated for the patient, if possible. Any patient-care equipment that is required for use by other patients should be thoroughly cleaned and disinfected before use.
- Place an appropriate container with a lid outside the door for equipment that requires disinfection or sterilization.
- Ensure that appropriate hand washing facilities and hand-hygiene supplies are available. Stock the sink area with suitable supplies for hand washing, and with alcohol-based hand rub, near the point of care and the room door.
- Ensure adequate room ventilation. If room is air-conditioned, ensure 12 air changes/ hour and filtering of exhaust air. A negative pressure in isolation rooms is desirable for patients requiring aerosolization procedures (intubation, suction nebulisation). These rooms may have standalone air-conditioning. These areas should not be a part of the central air-conditioning.
- If air-conditioning is not available negative pressure could also be created through putting up 3-4 exhaust fans driving air out of the room.
- In **district hospital**, where there is sufficient space, natural ventilation may be followed. Such isolation facility should have large windows on opposite walls of the room allowing a natural unidirectional flow and air changes. The principle of natural ventilation is to allow and enhance the flow of outdoor air by natural forces such as wind and thermal buoyancy forces from one opening to another to achieve the desirable air change per hour.
- The isolation ward should have a separate toilet with proper cleaning and supplies.
- Avoid sharing of equipment, but if unavoidable, ensure that reusable equipment is appropriately disinfected between patients.

- Ensure regular cleaning and proper disinfection of common areas, and adequate hand hygiene by patients, visitors and care givers. Keep adequate equipment required for cleaning or disinfection inside the isolation room or area, and ensure scrupulous daily cleaning of the isolation room or area.
- **Visitors to the isolation facility should be restricted /disallowed.** For unavoidable entries, they should use PPE according to the hospital guidance, and should be instructed on its proper use and in hand hygiene practices prior to entry into the isolation room/area.
- Ensure that visitors consult the health-care worker in charge (who is also responsible for keeping a visitor record) before being allowed into the isolation areas. Keep a roster of all staff working in the isolation areas, for possible outbreak investigation and contact tracing.
- Doctors, nurses and paramedics posted to isolation facility **need to be dedicated** and not allowed to work in other patient-care areas.
- Consider having designated portable X-ray and portable ultrasound equipment.
- Corridors with frequent patient transport should be well-ventilated.
- All health staff involved in patient care should be well trained in the use of PPE.
- Set up a telephone or other method of communication in the isolation room or area to enable patients, family members or visitors to communicate with health-care workers. This may reduce the number of times the workers need to don PPE to enter the room or area.

C. Checklist for isolation rooms

- Eye protection (visor or goggles)
- Face shield (provides eye, nose and mouth protection)
- Gloves
- reusable vinyl or rubber gloves for environmental cleaning
- latex single-use gloves for clinical care
- Hair covers
- Particulate respirators (N95, FFP2, or equivalent)
- Medical (surgical or procedure) masks
- Gowns and aprons
- single-use long-sleeved fluid-resistant or reusable non-fluid-resistant gowns
- plastic aprons (for use over non-fluid-resistant gowns if splashing is anticipated and if fluid-resistant gowns are not available)
- Alcohol-based hand rub
- Plain soap (liquid if possible, for washing hands in clean water)
- Clean single-use towels (e.g. paper towels)
- Sharps containers

- Appropriate detergent for environmental cleaning and disinfectant for disinfection of surfaces, instruments or equipment
- Large plastic bags
- Appropriate clinical waste bags
- Linen bags
- Collection container for used equipment
- Standard IEC
- Standard protocols for hand hygiene, sample collection and BMW displayed clearly
- Standard Clinical management protocols

D. Wearing and removing Personal Protective Equipment (PPE)

Before entering the isolation room or area:

- Collect all equipment needed;
- Perform hand hygiene with an alcohol-based hand rub (preferably when hands are not visibly soiled) or soap and water;
- Put on PPE in the order that ensures adequate placement of PPE items and prevent self-contamination and self-inoculation while using and taking off PPE; an example of the order in which to don PPE when all PPE items are needed is hand hygiene, gown, mask or respirator, eye protection and gloves

Leaving the isolation room or area

- Either remove PPE in the anteroom or, if there is no anteroom, make sure that the PPE will not contaminate either the environment outside the isolation room or area, or other people.
- Remove PPE in a manner that prevents self-contamination or self-inoculation with contaminated PPE or hands. General principles are:
 - remove the most contaminated PPE items first;
 - perform hand hygiene immediately after removing gloves;
 - remove the mask or particulate respirator last (by grasping the ties and discarding in a rubbish bin);
 - discard disposable items in a closed rubbish bin;
 - put reusable items in a dry (e.g. without any disinfectant solution) closed container; an example of the order in which to take off PPE when all PPE items are needed is gloves (if the gown is disposable, gloves can be peeled off together with gown upon removal), hand hygiene, gown, eye protection, mask or respirator, and hand hygiene
 - Perform hand hygiene with an alcohol-based hand rub (preferably) or soap and water whenever un-gloved hands touch contaminated PPE items.

E. Transport of Infectious Patients

It is recommended that transport of infectious patients is limited to movement considered medically essential by the clinicians, e.g. for diagnostic or treatment purposes. Where infectious patients are required to be transported to other units within the hospital or outside the following precautions may be implemented:

- Infected or colonised areas of the patient's body are covered: - For contact isolation this may include a gown, sheets or dressings to surface wounds; these patients are transferred to a Standard Pressure or Protective Environment Isolation room - For respiratory isolation the patient is dressed in a mask, gown and covered in sheets; these patients are accommodated in a Negative Pressure Isolation Room - For quarantine isolation the patient may be transported in a fully enclosed transport cell or isolator with a filtered air supply and exhaust; these patients are accommodated in a high level quarantine isolation suite.
- The transport personnel remove existing PPE, cleanse hands and transport the patient on a wheelchair, bed or trolley, applying clean PPE to transport the patients and when handling the patient at the destination. Gown-up and gown-down rooms located at the entry to a Unit will assist the staff to enter and exit the facility according to the strict infection control protocols required, thereby reducing the risk of contamination
- The destination unit should be contacted and notified prior to the transfer to ensure suitable accommodation on arrival.
- It is preferred that the patient is transported through staff and service corridors, not public access corridors During planning stages, design can assist transfer of infectious patients by providing service corridors and strategically placed lifts, capable of separation from other lifts. The nominated lift may be isolated from public and staff transit through access control measures and cleaned following transit of the infectious patient.
- Design may also incorporate a designated floor for horizontal bed transfers of infectious patients away from busy clinical areas. The designated floor may be located at mid-level in the hospital
- A combination of nominated lifts, corridors and a bed transfer floor would assist in the movement of infectious patients through the hospital and minimise the risk of spread of infection.

Annexure I

Checklist for isolation rooms

- Eye protection (visor or goggles)
- Face shield (provides eye, nose and mouth protection)
- Gloves
- reusable vinyl or rubber gloves for environmental cleaning
- latex single-use gloves for clinical care
- Hair covers
- Particulate respirators (N95, FFP2, or equivalent)
- Medical (surgical or procedure) masks
- Gowns and aprons
- single-use long-sleeved fluid-resistant or reusable non-fluid-resistant gowns
- plastic aprons (for use over non-fluid-resistant gowns if splashing is anticipated and if fluid-resistant gowns are not available)
- Alcohol-based hand rub
- Plain soap (liquid if possible, for washing hands in clean water)
- Clean single-use towels (e.g. paper towels)
- Sharps containers
- Appropriate detergent for environmental cleaning and disinfectant for disinfection of surfaces, instruments or equipment
- Large plastic bags
- Appropriate clinical waste bags
- Linen bags
- Collection container for used equipment
- Standard IEC
- Standard protocols for hand hygiene, sample collection and BMW displayed clearly
- Standard Clinical management protocols

Annexure II

Hospital Preparedness & Isolation Facility Assessment Checklist - COVID19

I . GENERAL INFORMATION

1. Name of the healthcare facility (HCF)																																												
2. Type	<input type="checkbox"/> Public <input type="checkbox"/> Private																																											
3. Category of HCF	<input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> Tertiary																																											
4. Subcategory	<input type="checkbox"/> PHC <input type="checkbox"/> UPHC <input type="checkbox"/> CHC <input type="checkbox"/> Taluk/Sub-District Hospital <input type="checkbox"/> District Hospital <input type="checkbox"/> General Hospital <input type="checkbox"/> Medical College Hospital <input type="checkbox"/> Multi-Speciality Hospital <input type="checkbox"/> Nursing Home <input type="checkbox"/> Dispensary <input type="checkbox"/> Clinic																																											
5. Address of the health facility																																												
a) Block																																												
b) District																																												
c) State																																												
d) Email ID																																												
e) Contact no.																																												
6. Name of Director/ Principal/Medical superintendent																																												
a) Email ID																																												
b) Contact no.																																												
7. Name of RMO/Hospital In-charge																																												
a) Email ID																																												
b) Contact no																																												
8. Total number of inpatient beds																																												
9. Total number of ICU beds																																												
10. Average number of OPD attendance per month																																												
11. Average number of new admissions /months																																												
12. Bed occupancy rate (Annual)																																												
13. Total staff strength	<table border="1"> <tr> <td colspan="2">Doctors – MBBS</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Doctors- AYUSH</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Clinical Specialists other than Intensivist/Pulmonologist</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Non-Clinical specialists other than Microbiologist</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Microbiologists</td> <td colspan="2"></td> </tr> <tr> <td>Intensivists #</td> <td>Pulmonologist #</td> <td>Int</td> <td>Pulm</td> </tr> <tr> <td>Senior Resident #</td> <td>Junior Resident #</td> <td>SR</td> <td>JR</td> </tr> <tr> <td colspan="2">Interns</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Nurses</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Lab technicians</td> <td colspan="2"></td> </tr> </table>				Doctors – MBBS				Doctors- AYUSH				Clinical Specialists other than Intensivist/Pulmonologist				Non-Clinical specialists other than Microbiologist				Microbiologists				Intensivists #	Pulmonologist #	Int	Pulm	Senior Resident #	Junior Resident #	SR	JR	Interns				Nurses				Lab technicians			
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Nurses																																												
Lab technicians																																												

	Pharmacists	
	Laboratory Technicians	
	Cleaning staff	
	Ambluance drivers	
14. Does this HCF have a designated COVID 19 isolation facility		<input type="checkbox"/> Yes <input type="checkbox"/> No

II. HCF PREPAREDNESS TO MANAGE MAJOR EPIDEMICS & PANDEMICS

15. Core Emergency Response / Rapid Response Team for outbreak management identified?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
16. Roles and responsibilities of RRT/ERT clearly defined?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
17. Is there a contingency plan for covering for a core team member who is absent?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
18. Monitoring and managing Health Care Personnel (HCP) a) The facility follows the Central/State public health policies/procedures for monitoring and managing HCP with potential for exposure to COVID-19 b) The facility have a process to conduct symptom and temperature checks prior to the start of duty shift for HCP	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
19. Training for Healthcare Personnel (HCP) a) Education and job-specific training to HCP regarding <ul style="list-style-type: none"> Signs and symptoms of infection Triage procedures including patient placement and filling the CIF Safely collect clinical specimen Correct infection control practices and PPE use HCP sick leave policies Recommended actions for not using recommended PPE How and to whom suspected cases (COVID-19) should be reported 	<input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started <input type="checkbox"/> Completed <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started

III. TRIAGE

20. Triage protocols available at the healthcare facility?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
21. Availability of telemedicine facility as a way to provide clinical support without direct interaction with the patient	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
22. Is there specific waiting area for people with respiratory symptoms?	
23. Availability of designated ARI/COVID-19 triage area	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
24. Do they have non-contact Infra-Red thermometer available near the registration desk?	
25. Availability of signage directing to triage area and signage to instruct patients to alert staff if they have symptoms of COVID-19	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
26. Do they have dedicated/single examination rooms in Triage area? (Dedicated room should satisfy criteria of one patient per room with door closed for examination)	<input type="checkbox"/> Yes <input type="checkbox"/> No
27. Triage area has signs/alerts about respiratory etiquette and hand hygiene?	<input type="checkbox"/> Yes <input type="checkbox"/> No
28. Does the HCF provide masks for patients with respiratory symptoms?	<input type="checkbox"/> Yes <input type="checkbox"/> No

29. Triage staff trained on revised COVID19 case definition and identify suspected cases ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
30. Screening questionnaire and algorithm for triage available with staff	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
31. Infrared thermometer available with the triage staff	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
32. Waste bins and access to cleaning/ disinfection supplies available in Triage area	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
33. Physical barriers (e.g., glass or plastic screens) at reception areas available to limit close contact between triage staff and potentially infectious patients	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
34. Does the patient waiting area have cross ventilation	<input type="checkbox"/> Yes <input type="checkbox"/> No
35. Waiting area cleaned at least twice daily with 0.5% hypochlorite solution (or) 70% alcohol for surfaces that do not tolerate chlorine	<input type="checkbox"/> Yes <input type="checkbox"/> No
36. Does the hospital have dedicated infrastructure for isolation facility? (If No skip to Section IV)	<input type="checkbox"/> Yes <input type="checkbox"/> No
37. Type of isolation Facility	<input type="checkbox"/> Temporary <input type="checkbox"/> Permanent
IV Isolation Facility	
38. Is the isolation facility near OPD/IPD/other crowded area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
39. Screening rooms identified and available at the isolation area?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
40. Is there separate entry to the isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
41. Dedicated space for staff to put on PPE while entering the isolated area	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
42. Is there separate exit for isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
43. Dedicated space for staff to take off PPE near exit?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
44. Isolation facility is separate and has rooms/wards?	<input type="checkbox"/> Rooms <input type="checkbox"/> Wards
45. Are washrooms available as 1 toilet per 20 persons?	<input type="checkbox"/> Yes <input type="checkbox"/> No
46. Number of beds in each isolation rooms/wards	
47. Is the distance between two beds in isolation wards/rooms more than 1 meter?	<input type="checkbox"/> Yes <input type="checkbox"/> No
48. Do the hospital have policy to segregate clinical staff (e.g. nurses) for care of COVID19 cases?	<input type="checkbox"/> Yes <input type="checkbox"/> No
49. Whether PPEs available and located near point of use? a. Gloves b. Gowns c. Face masks d. 95 respirators	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
50. Whether the hospital limits the movement of patients in the isolation facility outside for medically necessary purposes only?	<input type="checkbox"/> Yes <input type="checkbox"/> No
51. Are the known or suspected COVID19 patients placed on contact and droplet precautions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
52. If a patient leaves their room for medical purposes, are they provided face mask ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
53. Do staff transporting the patient wear PPE?	<input type="checkbox"/> Yes <input type="checkbox"/> No
54. While transporting patients are specific routes used to minimize contact with other patients and staff?	<input type="checkbox"/> Yes <input type="checkbox"/> No
55. For a patient on Airborne Precautions, air pressure is monitored daily with visual indicators (e.g., smoke tubes, flutter strips), regardless of the presence of differential pressure sensing devices (e.g., manometers):	<input type="checkbox"/> Yes <input type="checkbox"/> No

56. Are these isolation rooms/wards satisfying the criteria of negative pressure class N? (Applicable if an aerosol generating procedure is performed)	<input type="checkbox"/> Yes <input type="checkbox"/> No
57. Is there Provision food in the isolation area?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
58. Policy for leftover food waste management?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
59. Is there an ICU facility attached to isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
60. Availability of cross ventilation	<input type="checkbox"/> Yes <input type="checkbox"/> No
61. Is there any designated area for sample collection?	<input type="checkbox"/> Yes <input type="checkbox"/> No
62. Are they following standard precautions and PPE while taking sample?	<input type="checkbox"/> Yes <input type="checkbox"/> No
63. Does the facility have a written policy for sample collection and transport?	<input type="checkbox"/> Yes <input type="checkbox"/> No
64. Are these sample transported in triple packing?	<input type="checkbox"/> Yes <input type="checkbox"/> No
65. Does the transportation package contain IATA DG code (UN3373)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
66. Are they following standard precautions while transporting the sample?	<input type="checkbox"/> Yes <input type="checkbox"/> No
67. Are the floors of isolation facility suitable for moping?	<input type="checkbox"/> Yes <input type="checkbox"/> No
68. Is drinking water available at isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
69. Availability of management protocols for COVID19	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
70. Is rotation roster of duty shift for staff posted at isolation facility	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
71. Is there any protocol for limiting the entry of visitors at isolation area?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
72. Availability of separate Thermometers BP apparatus with adult & Pediatric cuffs?	<input type="checkbox"/> Yes <input type="checkbox"/> No
73. Availability of discharge policy for COVID19	<input type="checkbox"/> Available <input type="checkbox"/> In Progress <input type="checkbox"/> Not Started

IV. INFECTION PREVENTION AND CONTROL PRACTICES

74. Does the hospital have Hospital Infection control Committee (HICC)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
75. Are there any infection control protocols/guidelines available?	<input type="checkbox"/> Available <input checked="" type="checkbox"/> In progress <input type="checkbox"/> Not started
76. Functioning hand washing stations (including water, soap and paper towel or air dry) at isolation area?	
77. Does the facility have uninterrupted running water supply?	<input type="checkbox"/> Yes <input type="checkbox"/> No
78. Is alcohol based hand sanitizer available at isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
79. Are the staff following five movements of hand washing?	<input type="checkbox"/> Yes <input type="checkbox"/> No
80. Are the staff following six steps of hand washing?	<input type="checkbox"/> Yes <input type="checkbox"/> No
81. Is there posters to reinforce hand washing and PPE at hand washing stations	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started

VI. ENVIRONMENTAL CLEANING

82. Are objects and environmental surfaces in patient care areas touched frequently (e.g., bed rails, overbed table, bedside commode, lavatory surfaces) are cleaned	<input type="checkbox"/> Yes <input type="checkbox"/> No
83. Are they disinfected with an approved disinfectant frequently (at least daily) and when visibly soiled?	<input type="checkbox"/> Yes <input type="checkbox"/> No
84. Is there cleaning chart?	<input type="checkbox"/> Yes <input type="checkbox"/> No
85. Frequency of cleaning of high touch areas, Bed rails, Tables, Chairs, Keyboards etc.,	
86. Is there any housekeeping policy available at isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No

87. Availability of terminal cleaning checklist	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
88. Availability of three bucket system	<input type="checkbox"/> Yes <input type="checkbox"/> No
89. Are they following correct contact time for disinfection with hypochlorite solution? (10 minutes for non-porous surfaces)	<input type="checkbox"/> Yes <input type="checkbox"/> No
90. Are the staff following outward mopping technique	<input type="checkbox"/> Yes <input type="checkbox"/> No
91. Availability of separate mops for each area	<input type="checkbox"/> Yes <input type="checkbox"/> No
92. Frequency of cleaning of isolation rooms?	
93. Frequency of cleaning of ambulatory areas?	
94. Frequency of cleaning of bathrooms of isolation areas?	
95. Staff wearing PPE while cleaning	<input type="checkbox"/> Yes <input type="checkbox"/> No
a. Gloves	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Masks	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Apron	<input type="checkbox"/> Yes <input type="checkbox"/> No
96. Are the staff trained in housekeeping and infection control practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No
97. Doctors, nurses & cleaning staff available/ shift at isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
98. Barrier nursing practiced at isolation area in 1:1 ratio?	<input type="checkbox"/> Yes <input type="checkbox"/> No
99. Is there any policy for linen management for isolation facility?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
100. What is the frequency of changing linen in isolation rooms?	<input type="checkbox"/> Daily <input type="checkbox"/> Alternate Days <input type="checkbox"/> Weekly <input type="checkbox"/> When Soiled
101. Type of linen used	<input type="checkbox"/> Disposable <input type="checkbox"/> Reusable

VII. BIOMEDICAL WASTE MANAGEMENT (BMW)

102. Availability of SOP for BMW management?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
103. Availability of agreement with CWTF	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
104. Are they following color codes bins in BMW management?	<input type="checkbox"/> Yes <input type="checkbox"/> No
105. Is there sufficient quantity color coded bags available?	<input type="checkbox"/> Yes <input type="checkbox"/> No
106. Are they disinfecting the waste before it is disposed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
107. Method of disposing biomedical wastes?	<input type="checkbox"/> CWTF <input type="checkbox"/> Deep burial <input type="checkbox"/> Incineration
108. Disposal of sharps as per the standard protocol?	<input type="checkbox"/> Yes <input type="checkbox"/> No
109. Availability of biomedical waste trolley?	<input type="checkbox"/> Yes <input type="checkbox"/> No
110. Availability of dedicated BMW collection area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
111. BMW collected from isolation facility within 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No

VIII. ICU FACILITY

112. Are there any beds dedicated for COVID 19 infection?	<input type="checkbox"/> Yes <input type="checkbox"/> No
113. If Yes, Number of beds dedicated to COVID 19 cases?	
114. Is the distance between beds in ICU more than 1 meter?	<input type="checkbox"/> Yes <input type="checkbox"/> No
115. Is the oxygen supply is by cylinder or central connection?	
116. Are there any separate Ventilators, nebulizers, Infusion pumps in ICU?	<input type="checkbox"/> Yes <input type="checkbox"/> No
117. Adequate supply of masks, ET tubes, PPE kits available at ICU?	<input type="checkbox"/> Yes <input type="checkbox"/> No
118. All ICU Staff received training in donning & doffing of PPE?	<input type="checkbox"/> Completed <input type="checkbox"/> In progress <input type="checkbox"/> Not started
119. Are there separate area for donning & doffing of PPE?	<input type="checkbox"/> Yes <input type="checkbox"/> No
120. Hand washing facility & hand sanitizer available at donning & doffing areas?	<input type="checkbox"/> Yes <input type="checkbox"/> No

XII. OTHER ESSENTIAL SERVICES

121. Is there strategy available for optimizing the PPE supply	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
122. Are there any stockout experience for PPEs in the last year.	<input type="checkbox"/> Yes <input type="checkbox"/> No
123. Designated ambulance facility for transporting patients from isolation area?	<input type="checkbox"/> Yes <input type="checkbox"/> No
124. List of contact numbers of ambulance drivers displayed at isolation area?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
125. Ambulance staff trained in wearing PPE & and other Infection control practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No
126. SOP for disinfecting ambulance after transporting confirmed case/dead body?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
127. Written protocol available for disposing dead bodies of confirmed cases?	<input type="checkbox"/> Available <input type="checkbox"/> In progress <input type="checkbox"/> Not started
128. Is there enough availability of body bags?	<input type="checkbox"/> Yes <input type="checkbox"/> No
129. Are the staff trained in handling dead bodies and wearing PPE?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Guidelines on Clinical management of severe acute respiratory illness (SARI) in suspect/confirmed novel coronavirus (nCoV) cases

Coronaviruses are respiratory viruses and broadly distributed in humans and other mammals. Some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal corona viruses can evolve and infect people and then spread between people such as has been seen with MERS and SARS. Although most human coronavirus infections are mild, the epidemics of the severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), have caused more than 10000 cumulative cases in the past two decades, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV. The current outbreak was initially noticed in a seafood market in Wuhan city in Hubei Province of China on 12th December, 2019 and has spread across China and many countries.

Purpose and scope of document

This document is intended for clinicians taking care of hospitalised adult and paediatric patients with severe acute respiratory infection (SARI) when an nCoV 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. Best practices for SARI including IPC and optimized supportive care for severely ill patients are essential.

This document aims to provide clinicians with updated interim guidance 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 WHO publications.

A. Triage: Early recognition of patients with SARI associated with nCoV 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 nCoV 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 nCoV*

SARI	An ARI with history of fever or measured temperature $\geq 38^{\circ}\text{C}$ 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 nCoV*	<ol style="list-style-type: none"> 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); <p>AND any of the following:</p> <ol style="list-style-type: none"> A history of travel to Wuhan, Hubei Province China in the 14 days prior to symptom onset; or 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 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 <ol style="list-style-type: none"> A person with acute respiratory illness of any degree of severity who,

	<p>within 14 days before onset of illness, had any of the following exposures:</p> <ul style="list-style-type: none"> a) close physical contact² with a confirmed case of nCoV infection, while that patient was symptomatic; or b) a healthcare facility in a country where hospital-associated nCoV infections have been reported;
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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*, *Haemophilus 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 with 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	Adolescent or adult: fever or suspected respiratory infection, plus one of respiratory rate >30 breaths/min, severe respiratory distress, or SpO ₂ $<90\%$ on room air Child with cough or difficulty in breathing, plus at least one of the following: central cyanosis or SpO ₂ $<90\%$; severe respiratory distress (e.g. grunting, very severe chest indrawing); 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 indrawing, 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.
Acute Respiratory Distress Syndrome	Onset: new or worsening respiratory symptoms within one week of known clinical insult. Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules.

	<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) • When PaO_2 is not available, $\text{SpO}_2/\text{FiO}_2 \leq 315$ suggests ARDS (including in non-ventilated patients) <p>Oxygenation (children; note OI = Oxygenation Index and OSI = Oxygenation Index using SpO_2)</p> <ul style="list-style-type: none"> • Bilevel 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 must be abnormal temperature or white blood cell count</p>
Septic shock	<p>Adults: persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP $\geq 65 \text{ mmHg}$ and serum lactate level $> 2 \text{ mmol/L}$</p> <p>Children: any hypotension (SBP $< 5^{\text{th}}$ centile or $> 2 \text{ SD}$ below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR $< 90 \text{ bpm}$ or $> 160 \text{ bpm}$ in infants and HR $< 70 \text{ bpm}$ or $> 150 \text{ bpm}$ in children); prolonged capillary refill ($> 2 \text{ sec}$) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia</p>

B. Immediate implementation of appropriate IPC measures

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 patients and other patients. Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. Perform
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	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 metres 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
Apply contact precautions	<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
Apply airborne precautions when performing an aerosol generating procedure	<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; PPE, personal protective equipment

C. Early supportive therapy and monitoring

- a. Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxaemia, 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 pneumonia [if infection was acquired in healthcare setting], or sepsis), local epidemiology and susceptibility data, and treatment guidelines. Empiric 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.¹⁸ Empiric 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 metapneumovirus, 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; FiO_2 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 FiO_2 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 oedema), 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 oedema 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 transpulmonary 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 hr). Patients with hemodynamic instability, multiorgan 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 (e.g. dyssynchrony, pH <7.15). 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. 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 hypoperfusion.

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 overdistension 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 ($\text{PaO}_2/\text{FiO}_2 < 150$), neuromuscular blockade by continuous infusion should not be routinely used. One trial found that this strategy improved survival in patients with severe ARDS ($\text{PaO}_2/\text{FiO}_2 < 150$) without causing significant weakness, but results of a recent larger trial found that use of neuromuscular blockade 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: ventilator dyssynchrony despite sedation, such that tidal volume limitation cannot be reliably achieved; 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 centres 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] $< 5^{\text{th}}$ 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 ≥ 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-NoVel-CoV 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.