



Ministry of Health Sri Lanka

Provisional Clinical Practice Guidelines on COVID-19 suspected and confirmed patients



In collaboration with Ceylon College of Physicians

Coordinated by Epidemiology Unit

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1 INTRODUCTION

The Coronavirus disease 2019 (COVID-19) epidemic can affect us in one way or another, and the recent severe outbreaks in several countries and the unpredictability of this epidemic will essentially require advance preparedness for optimum care in the health sector. With this in view, it became necessary to develop a clinical practice guideline (CPG) on clinical management of COVID -19 patients. However, this CPG will be reviewed and revised based on further evidence as the disease situation progresses.

Experience from Wuhan the capital city of Hubei province in central China, the epicenter of this epidemic where the majority of patients and deaths reported was the basis of this guideline. Preliminary evidence from COVID -19 cases suggest that transmission during the early phase of illness also seems to contribute to overall transmission dynamics; therefore, isolation of more severely ill patients at the time of presentation to health-care facilities alone will not be adequate. As the epidemic unfolds, it has become apparent that mild cases are common in COVID-19 epidemic. Patients with mild disease manifestations will be missed unless a more sensitive surveillance system is put in place, and these patients might spread the disease silently, similar to influenza. However, more critical and life-threatening disease has been observed among old age groups especially with co-morbidities. Therefore, early case detection, prompt isolation of ill people, appropriate and timely management of patients, comprehensive contact tracing and immediate quarantine of all possible contacts will minimize widespread community transmission and will help to mitigate any major outbreak situation and associated mortality.

This provisional CPG will be useful in early detection and management of suspected and confirmed cases of COVID- 19, and to develop the capacity of the health sector to be prepared for any eventuality with suspected and confirmed COVID-19 outbreaks.

1.1 Clinical case definitions of COVID-19

The present recommendation is to isolate and test all clinically suspected cases of COVID-19 infected patients.

Clinically Suspected Case:

- A. A person with ACUTE RESPIRATORY ILLNESS (with Cough, SOB, Sore throat) with a history of FEVER (at any point of time during this illness), returning to Sri Lanka from ANY COUNTRY within the last 14 days.

OR

- B. A person with acute respiratory illness AND having been in close-contact* with a confirmed or suspected COVID-19 case during the last 14 days prior to onset of symptoms;

** Close-contact: A person staying in an enclosed environment for >15 minutes (e.g. same household/workplace/social gatherings/travelling in same vehicle).*

OR

- C. A patient with severe acute pneumonia** (critically ill and not explainable by any other aetiology) regardless of travel or contact history as decided by the treating Consultant

*** Severe acute pneumonia: A patient with features of severe respiratory distress, RR>30 per minute, SpO₂ <90% at room air.*

Confirmed case

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

1.2 Disposition of cases

Disposition of suspected case

All patients fitting to the above suspected case definitions (A, B or C) should be admitted and transferred by ambulance to the closest designated hospital (see Annexure for the list of designated hospitals) for confirmatory testing and management. This should be done only after stabilizing the patient and in prior consultation with the respective designated hospital, adhering to necessary infection prevention and control (IPC) precautions.

Disposition of a confirmed case

All confirmed patients should be transferred to National Institute of Infectious Diseases (IDH) with necessary precautions.

THESE INSTRUCTIONS ARE TO BE APPLIED IN ALL HOSPITALS INCLUDING THOSE IN THE PRIVATE SECTOR

1.3 Assess severity, resuscitate if necessary and patient disposition by first contact doctor

A suspected COVID-19 patient can present in one of several ways to a health care facility or a general practice. A person presenting for screening purposes with or without mild symptoms, a person with

early respiratory symptoms and a person with pneumonia with acute respiratory distress, where all three groups having had a travel or contact history. Ideally, treatment centers should have clear sign posting so that a suspected COVID-19 patient will go straight to a predetermined room (isolation room) for further evaluation and treatment. Suspected patients should be provided with a medical mask. There should be a designated medical officer who will assess the patient by taking history of symptoms, travel and contact and screen whether such patients fit into the clinical case definition. Those who fit into the suspected case definition and who may need hospital admission will be referred to the nearest designated health care institution for confirmatory testing and management (list of hospitals and designated laboratories annexed). Screening doctors should take necessary precautions by wearing standard personal protective equipment (PPE) i.e. standard surgical mask, disposable gloves and apron. This system is especially applicable in a situation when there is established community level disease transmission or significant number of patients are screened routinely.

Of those who are screened and found to have no symptoms including family contacts should be advised on self-isolation by staying indoors for 14 days (incubation period) in a well-ventilated room separate from the rest of the household. Such individuals should be advised to use separate toilet, or clean shared toilet regularly and use separate towels and not to entertain visitors. They should seek advice regularly on further management from the designated sentinel hospital and area public health staff if they develop clinical symptoms.

Initial data from COVID-19 transmission areas suggest that the patients display approximately three proportions of severity – 80% having mild symptoms, 15% severe disease, 5% critically unwell. Those with severe disease or critically unwell patients should be given emergency treatment at the initial treatment center and transported to the designated sentinel hospital. Patients fitting the suspected case definition should be tested for COVID-19 at the designated laboratory assigned for each sentinel hospital. A critically ill patient seen at a hospital ETU who might be resuscitated but subsequently fitting to COVID-19 suspected definition based on the history should be isolated in a separate area in ETU until transfer facilities are made available. Hospital ambulance or ‘Suwasariya’ service should provide transfer facilities to the designated sentinel hospital and the vehicle used for transporting such patients should be disinfected at the receiving end.

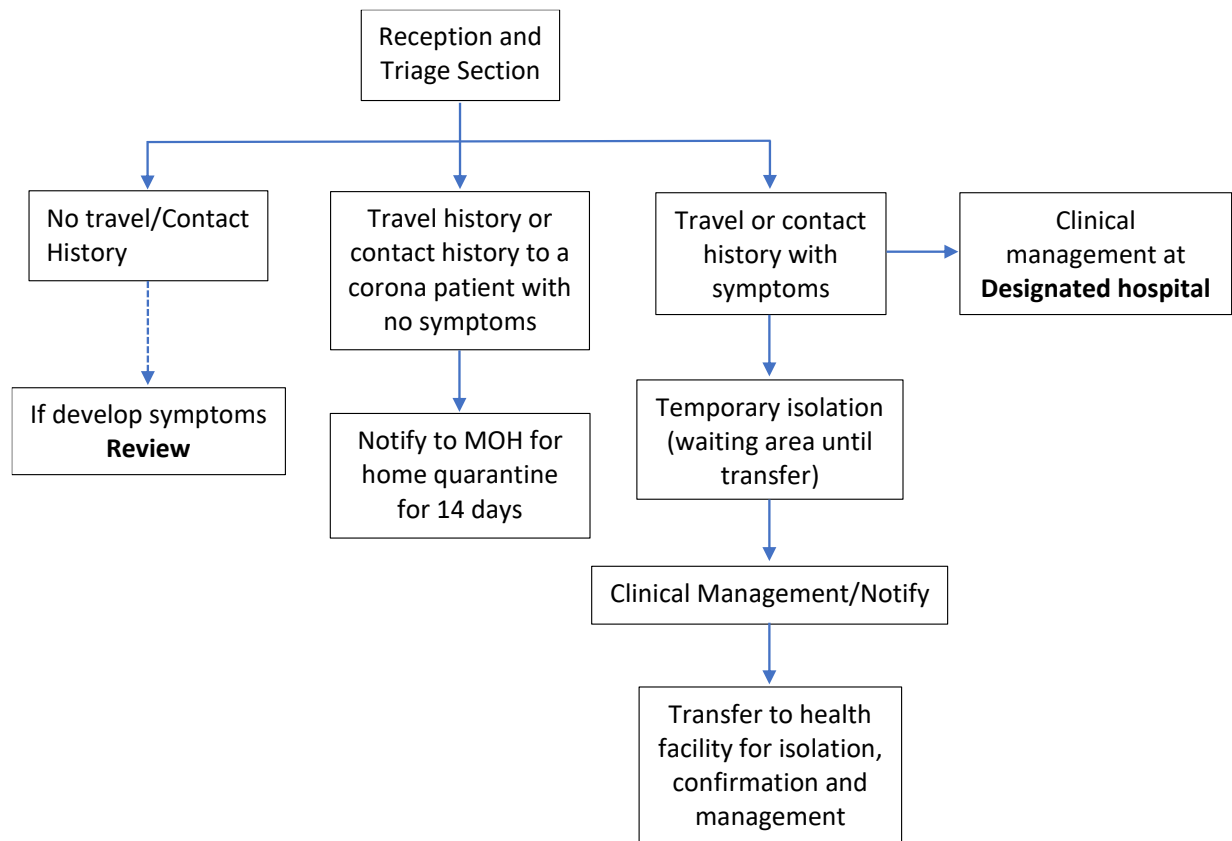


Figure 1: Primary care assessment of suspected Covid-19 patient

2 PREPARING DOCTORS FOR ASSESSMENT OF PATIENTS

Current corona virus (COVID-2019) infection may present with mild, moderate, or severe illness. Severe illness includes severe pneumonia, ARDS, sepsis and septic shock. Early recognition of suspected patients allows for timely initiation of infection prevention and control (IPC) measures.

Key action points:

- **A designated area in the hospital should be identified away from the main OPD to screen patients.**
- **This should be at the entrance to the facility, away from patient waiting areas.**
- Clear sign posts should direct the patient to this area.
- A medical mask should be provided to the patient immediately at the designated area.
- The medical officer at the screening area should obtain a brief history (including contact and travel history) and conduct a brief examination (pulse, respiratory rate, oxygen saturation).
- Any patient who fits in to the definition of COVID-19 suspect should be admitted to a pre-designated isolation area (room or ward).
- The patient should be clinically assessed and categorized according to the table below. This tool is intended to be used at the screening centre to decide on the level of care.

Parameter	Level of severity (one or more)		
	Mild	Moderate	Severe (Critical)
1. Resp. Rate (RR/min)	12 – 20	20 – 30	> 30
2. Heart Rate (HR/min)	< 100	100 – 120	> 120
3. O ₂ Saturation – on room air (% by Pulse Oxymeter)	> 94	90 – 94	< 90
Level of care	Isolation area	Isolation area with resuscitation facilities	Designated isolation area with critical care facilities

- The patient should be stabilized and necessary investigations done according to severity and clinical indications.
- Once stabilized, the patient should be transferred by ambulance to the closest designated hospital (see Annexure for the list of designated hospitals) for confirmatory testing and management.
- The transfer should be done after informing the respective hospital, following necessary IPC precautions.

Natural History of COVID-19 (with limited evidence available globally)

- **At diagnosis:** approx. 80% are mild; 15% severe; 5% critical
- **Progression:** approx. 10-15% of mild/moderate cases become severe
approx. 15-20% of severe become critical
- **Average times:**
 - From exposure to symptom onset is 5-6 days;
 - From symptom onset to recovery for mild cases is 2 weeks and 3 – 6 weeks for severe cases;

Figure 2: Brief natural history of COVID-19

3 DIAGNOSING COVID-19

3.1 Laboratory diagnosis of COVID-19

Indications

Testing for COVID-19 is indicated only for the patients who are belongs to case definition issued by the Ministry of Health. Please refer the latest guidelines issued by the Ministry of Health. Testing for COVID-19 for screening purpose is not recommended.

Test method

Detection of COVID-19 (SARS-2) virus RNA by real time RT-PCR.

Detection of viral antigen and detection of IgM/ IgG antibodies against COVID-19 virus by rapid immunochromatographic test (ICT) is not recommended at present.

Sample collection

Type of the samples is depending on the clinical presentation of the patients.

Patient with mild upper respiratory tract infection, nasopharyngeal or oropharyngeal swabs in Viral Transport Medium (VTM) is preferred or use a sterile, leak-proof, screw-cap container with VTM for sputum.

In patients with more severe respiratory disease, endotracheal aspirate or bronchoalveolar lavage collected in VTM.

Tissue from biopsies or autopsy including those from the lungs in VTM

Ensure that Health Care workers (HCWs) who collect specimens should follow the standard and precautions and should use the recommended PPE.

Perform procedures in an adequately ventilated room and should follow the steps of donning and doffing of PPE.

Perform hand hygiene before and after contact with the patient and his or her surroundings and after PPE removal.

Specimen should be labelled properly.

Transport of samples to the laboratory

Sample should be transported to testing laboratory as soon as possible with ice (4°C). If any delay, can be stored at refrigerator (4°C) up to 48 hours. Do not freeze.

Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.

Sample should be transported in **triple package** to ensure the requirements in the national or international regulations for the transport of dangerous goods (infectious substances).

State the full name, age, travel history, clinical symptoms and the type of specimen of the suspected case clearly on the accompanying request form.

Notify the laboratory as soon as possible that the specimen is being transported.

PPE is not necessary for people who transport specimens in the triple package.

Description of Triple package

Primary receptacle	Should be a waterproof, leak-proof receptacle containing the specimen and receptacle should be wrapped with absorbent material to absorb all fluid in case of breakage. Preferably plastic container.
Secondary receptacle	Should be a durable, waterproof, leak-proof receptacle to enclose and protect the primary receptacle(s). Preferably styrofoam container. Ice packs should be placed in between primary and secondary receptacles.
Outer package	Container which the secondary receptacle is placed. Preferably cardboard box.

3.2 Infection prevention and control (IPC) measures

- Initiate IPC at the point of entry of the patient to health care facility.
- Suspected COVID-19 patients should be given a mask and directed to separate area.
- Keep at least 1 m distance between suspected patients.
- Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow and perform hand hygiene after contact with respiratory secretions.
- Standard precautions should always be applied in all areas of health care facilities. That is hand hygiene, the use of personal protective equipment (PPE) when in indirect and direct contact with patients' blood, body fluids, secretions (including respiratory secretions) and non-intact skin. Prevention of needle-stick or sharps injury; safe waste management; cleaning and disinfection of equipment; and cleaning of the environment.
- Additional precautions (e.g. droplet, contact, or airborne) are required.
- IPC measures should be adhered to at all times.

Healthcare facility management

Managing patient placement

- If possible place COVID 19 suspected patients in single rooms
- Maintain at least 1 meter distance between all patients
- Avoid putting more than one patient in a single hospital bed
- Have alcohol based hand rub or soap and water hand-washing stations readily available
- Keep dedicated equipment for the patient eg stethoscope, BP apparatus

Managing the environment

- Limit movement of patients within the healthcare facility to reduce spread of infection
- If a patient needs to be moved eg for a imaging, transfer out of hospital, plan ahead: all staff and visitors who will come into direct contact with the patient should wear PPE
- Perform regular environment cleaning and disinfection (annexure)
- Maintain good ventilation. If possible open doors and windows

Managing visitors

- Limit the number of visitors per patient
- All visitors should wear PPE

For healthcare workers

- At the point of entry /triage – medical mask
- Collecting respiratory specimens- goggles/face shield, preferably N-95 Mask, gown (long sleeves), gloves
- Caring for a patient (confirmed or suspected)- no aerosol generating procedure – goggles/face shield, gown, gloves, medical mask
- Caring for a patient (confirmed or suspected)- with aerosol generating procedures - goggles/face shield, gown, gloves, N95 respirator
- Transport of a patient (confirmed or suspected) – goggles/face shield, medical mask, gown, gloves
- Boots and overall suits are not required.
- Do not touch your eyes, nose or mouth with gloves or bare hands until proper hand hygiene has been performed.
- PPE s should be changed between use and for each patient. Dispose in a waste bin with lid and wash hands thoroughly. Anything single use cannot be re used or sterilized.

- Hand hygiene –Use an alcohol based hand rub or wash hands with soap and water
 - Before touching a patient
 - Before engaging in clean/aseptic procedures
 - After body fluid exposure risk
 - After touching a patient
 - After touching patient surroundings

Also see annexure on Guidance on the rational use of personal protective equipment (PPE) in hospitals in the context of COVID-19 disease

4 CLINICAL MANAGEMENT

4.1 COVID 19 confirmed cases or COVID 19 suspected patients

1. Mild, no pneumonia –
 - To be managed in an isolation area (COVID 19 confirmed cases can be managed together)
 - Monitoring of pulse, respiratory rate and saturation (Minimum of twice a day or as clinically indicated)
 - Observe for evidence of deterioration.
 - High risk patients may require more frequent monitoring(eg: Age more than 50 yrs/diabetes/cardiovascular diseases/ other comorbidities)
 - **Therapies** – anti pyretics for fever, supportive therapy
2. Those with evidence of pneumonia
 - To be managed in the designated ward/area for COVID 19 patients/suspects
3. Pneumonia with ARDS, Sepsis/Septic Shock and multi-organ failure.
 - **Mild – no need for supplemental oxygen**
 - **Moderate – requires oxygen**
 - **Severe – See section on critical care (Chapter 5)**

Obtain blood for basic haematology, biochemistry, ECG, X-Ray chest (use portable X Ray if facilities are available)

Therapies -

- Oxygen (maintain saturation>94%, via supplemental oxygen.) Use disposable, single use oxygen delivery devices (nasal prongs, simple nasal mask, venturi devices)
- HFNO (High Flow Nasal Oxygen) – In those with respiratory failure, but unable to ventilate. Should be done with the health care personnel in PPE with N95 mask as this is an aerosol generating procedure
- NIV (Non- Invasive Ventilation) - In those with respiratory failure, but unable to ventilate. Should be done with the health care personnel in PPE with N95 mask as this is an aerosol generating procedure
- Identify patients co morbid conditions (IHD, DM, HT) and manage accordingly
- IV fluids – use conservatively. Aggressive fluid resuscitation will worsen oxygenation

Dual infection – Infections with another pathogen in addition to COVID 19. Eg Dengue, Influenza. A positive COVID 19 does not rule out other infections.

There is no place for systemic corticosteroids, unless the patient has an asthma/ COPD exacerbation

4.2 Discharge criteria

- When patient is clinically well
- Fever free for more than 72 hrs.
- Two (2) negative PCR more than 24 hrs apart (preference sputum sample)
- On discharge patients should follow strict home isolation for minimum of 3 weeks, as preliminary evidence suggest viral shedding may be prolonged

This information will be updated regularly, based on additional evidence.

5 MANAGEMENT OF CRITICALLY ILL PATIENTS WITH COVID-19

Patient is considered critically ill when he/ she show signs of multiple organ dysfunctions and likely to die. Prioritizing and triaging patients who will be benefitted by ICU admission is of paramount importance while taking measures to increase the surge capacity for ICU

5.1 Criteria for ICU admission to the dedicated ICU

1. Confirmed patients with COVID 19
AND
2. Acute and potentially reversible organ dysfunction poorly responding to initial resuscitation
 - a. Severe respiratory failure or intubated ($\text{SpO}_2/\text{FiO}_2$ ratio < 200)
 - b. Refractory circulatory shock ($\text{SBP} < 90$ mmHg, Lactate > 4)
 - c. More than single organ failureAND
3. Patient has adequate physiological reserves to survive critical illness eg; good baseline organ functions without significant chronic co-morbidities
AND
4. Goals of ICU admission are defined. e.g; for full escalation of organ supports, limited escalation for 48 hours

5.2 Referral and decision for ICU admission

1. Any physician or experienced member of the treating team may refer patients to designated ICU for admission of critically ill COVID 19 patients.
2. In addition, nursing staff, or members of the outreach/medical emergency team where one exists, may need to alert the ICU medical staff directly in circumstances of unusual urgency.
3. Consultant in-charge of the ICU or experienced member of the ICU team should carefully assess the patients trajectory and agree with the referring team to admit only those who will be potentially salvageable/ benefitted by ICU care
4. The referring team shall maintain responsibility for the patient up to admission to ICU, and shall remain responsible for ongoing management if admission is refused or deferred.

5.3 Discharging patients from ICU

- Patient step down /discharge from the ICU to a HDU or ward has to be carefully and rapidly planned as the demand for bed will rise exponentially leading to collapse of all the critical care services.
- Every patient should be daily assessed in ABCDE order to promptly de-escalate as they get better. De-escalation plan should be reviewed at least twice a day in-order to liberate patients from life sustaining measures early.
- Patients stepped down from ICU/HDU should be send back to a separate cubicle in the cohort area for COVID 19 confirmed cases as some of them may still shed the virus at the time of the discharge.
- Those who are with multiple co-morbidities and poor physiological reserves **or** unable to show expected progress during pre-determined ICU trial (eg; for 48 hours) should be either stepped down or not for further escalation in case of further deterioration.
- Deceased patients with COVID 19 : Refer to the chapter on disposal of deceased

5.4 Increasing ICU surge capacity

1. Create cohort ICUs for COVID-19 patients (areas separated from the rest of the ICU beds to minimize risk of in-hospital transmission).
2. Organize a triage area where patients could receive mechanical ventilation if necessary in every hospital to support critically ill patients with suspected COVID-19 infection, pending the final result of diagnostic tests.
3. Establish local protocols for triage of patients with respiratory symptoms, to test them rapidly, and, depending on the diagnosis, to allocate them to the appropriate cohort.

4. Ensure that adequate personal protective equipment (PPE) for health personnel is available, with the organization of adequate supply and distribution along with adequate training of all personnel at risk of contagion.
5. Report every positive or suspected critically ill COVID-19 patient to the regional coordinating center.
6. Take immediate measures to convert non-functioning ICU beds available
7. Postpone or cancel non-urgent procedures and potentially convert some surgical theatres as critical care areas.
8. Create new ICU beds and made available within few days to account for at least 10% of the expected cases of COVID 19 infection.
9. Patients suspected of having severe / critical symptoms of COVID-19 should be resuscitated on admission in an isolated area of the respective OPD/ETU/ED with facilities for potential escalation to ventilator support (NIV/HFNC/ portable ventilator). Those patients should be either subjected to prompt PCR testing if available onsite or transferred to a sentinel hospital designated for COVID-19 PCR testing after informing the respective hospital.

5.5 Receiving critically ill patients (suspected/ confirmed having COVID 19) to ICU

1. **Isolation;** Health care staff receiving patients should be wearing appropriate PPE. Patients should be admitted to isolation room / cohort isolation with negative pressure ventilation, if available.
2. **Assessment;** Patient should be assessed according to the ABCDE order, however thorough and repeated clinical examination is not advised to minimize the exposure. Immediate connection of patient to multipara monitor, urgent portable chest X-ray and arterial blood gas analysis is useful to confirm the severity of physiological derangement and working diagnosis.
3. **Maintain oxygenation;** Initiate oxygen therapy at 6L/min and titrate flow rates to reach target SpO₂ ≥ 90% in non-pregnant adults and SpO₂ ≥ 92-95 % in pregnant patients. If the patient remains distressed with high work of breathing, hypoxaemic or in refractory shock, early invasive mechanical ventilation is advised over a trial of non-invasive ventilation or high flow nasal oxygen therapy.
4. **Hemodynamic resuscitation;** Prompt intravenous access should be established and those who are in circulatory shock (as evidenced by hypotension, oliguria, cold peripheries) should be resuscitated with crystalloid boluses. Consider noradrenalin, early as the first line vasopressor to achieve MAP ≥ 65 mmHg. Conservative fluid management is advised in patients with or without acute respiratory distress syndrome (ARDS).
5. **Empiric antimicrobials** Initial empiric therapy with neuraminidase inhibitors could be if there is concern that the patient might have influenza pneumonia. Empirical antibiotics should be considered early in patients with evidence of secondary bacterial infection.

6. **Steroids;** are not indicated in COVID-19 infections unless, there is *another* clear-cut indication for steroid (e.g. coronavirus plus asthma exacerbation, refractory septic shock with escalating vasopressor support).
7. **Invasive lines;** Consider insertion of arterial catheter and ultrasound guided central venous catheter early on those who present with circulatory shock. Those who may potentially need prone ventilation due to rapid deterioration or acute kidney injury would need a tri-lumen vascular catheter instead of central venous catheter for potential renal replacement therapy.
8. **Escalation plan;** understand the patient's co-morbid condition(s) to tailor the management of critical illness and appreciate the prognosis. Communicate proactively with patients and families and provide support and prognostic information. Understand the patient's values and preferences regarding life-sustaining interventions.
9. **Enteral nutrition;** should be established early. However, one should be cautious when a critically ill may potentially need endotracheal intubation or remains in severe shock. The glycaemic target of 140-180 mg/dL is recommended for critically ill patients.

Critically ill patients with COVID 19 can be broadly categorized as acute respiratory distress syndrome (ARDS) or sepsis/ septic shock depending on the predominant physiological derangement. However, these conditions may co-exist in most of the cases that are critically ill.

5.5.1 Endotracheal Intubation

1. This represents a high risk for transmission to healthcare workers.
2. Airborne precautions (N95 masks) are indicated along with face shield and full contact precautions.
3. Minimize personnel in the intubating room during the procedure.
4. **Endotracheal intubation**, which exposes the medical professional for COVID 19, should only be attempted by an airway competent doctor. It is advised to wear full PPE and take precautions as follows.
 - a) Employ rapid sequence induction to minimize contact time with the patient.
 - b) Pre oxygenate with C-Circuit/ D-circuit and tight fitting face mask / two handed grip to minimize leak. Avoid bagging to reduce aerosalisation .
 - c) Use of videolaryngoscopy may avoid placing the operator's face close to the patient.
 - d) Attach a viral filter to the bag-valve mask before the procedure, if possible. This should reduce the spread of viral particles out of the endotracheal tube following intubation (or during bag-mask ventilation if that is required)
 - e) Attach to the ventilator immediately post intubation and do not use positive pressure until cuff inflated.
 - f) Use capnography or predetermined length to decide the placement of ET tube to avert the need for clinical examination.
 - g) Ensure meticulous removal, placement and discard of equipments used and PPEs.

5. **Non-invasive ventilation;** If NIV is applied in case if invasive ventilation is not available; non-vented NIV mask (oro-nasal interface) with dual limb circuit should be used with minimal leak around the mask.
6. **High flow oxygen device** and single limb NIV with vented mask is discouraged to minimize aerosolisation. However, low flows 15-30 L/min may be considered.
7. **Lung protective mechanical ventilator strategy** (refer to management of ARDS) and ventilator care bundle (head end elevated, subglottic suction, daily sedation interval, spontaneous breathing trials, gastric ulcer prophylaxis and VTE prophylaxis) should be applied to minimize the complications of invasive ventilation.

5.6 Acute Respiratory Distress Syndrome (ARDS) associated with COVID 19 infection

Acute respiratory distress syndrome denotes a predominant oxygenation failure characterized by acute diffuse, inflammatory lung injury, leading to increased pulmonary vascular permeability, increased lung weight, and loss of aerated lung tissue. Diagnosis of ARDS is made based on the “2012 Berlin criteria”

5.6.1 ARDS diagnostic criteria

1. Onset within 1 week of signs of the illness
2. Bilateral opacities consistent with pulmonary edema must be present and may be detected on CT or chest radiograph
3. P/F ($\text{PaO}_2/\text{FiO}_2$) ratio $<300\text{mmHg}$ with a minimum of $5\text{ cmH}_2\text{O}$ PEEP or non-ventilated
4. Respiratory failure is not fully explained by cardiac failure or fluid overload.

ARDS associated with COVID 19 is categorized according to the degree of oxygenation failure, which has implications on therapeutic approach as follows;

- Mild ARDS: $200\text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300\text{ mmHg}$ (with PEEP or CPAP $\geq 5\text{ cmH}_2\text{O}$, or non-ventilated)
- Moderate ARDS: $100\text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200\text{ mmHg}$ with PEEP $\geq 5\text{ cmH}_2\text{O}$, 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)

5.6.2 Management of ARDS

- **Invasive mechanical ventilation;** moderate to severe ARDS ($\text{PF} < 200$) patients will essentially need mechanical ventilatory support to maintain oxygenation and ventilation. As NIV and high flow nasal oxygen therapy is controversial due to high risk of aerosolisation, timely invasive mechanical ventilation may benefit both the patient and the health care staff.

- **Lung protective ventilator strategy** remains the mainstay of delivering ventilator therapy. Every patient who receives MV should be set goals as follows;
 - a. Tidal volumes < 6-8 ml/Kg
 - b. PEEP titrated to FiO₂ (target moderate PEEP)
 - c. Plateau pressure < 30 cmH₂O (Driving Pressure < 18 cmH₂O)
 - d. SpO₂ 88-92% (permissive hypoxia)
 - e. Permissive hypercapnea to maintain pH > 7.25
- **Adequate sedation and muscle paralysis** (< 48 hours) is advised for those who are on escalating supports from mechanical ventilator.
- **Humidification** should be essentially applied and closed suction devices should be used to prevent frequent ventilator disconnections (avoid de-recruitment of the lung as well as aerosolisation).
- **Bacterial and viral filters** should be applied during mechanical ventilation.
- **Nebulisation** should be used only when essential.
- **Restrictive fluid strategy**; patients should be assessed for fluid responsiveness employing multiple parameters and intravenous fluids should be limited unless there is circulatory shock.
- **Prone ventilation** (annexure); early prone ventilation for 20 hours or more should be considered for those who are deteriorating with PF < 150 (severe ARDS). However, it is crucial to exclude other causes of sudden hypoxaemia eg; pneumothorax, lung collapse before attempting prone ventilation.
- **Percutaneous dilated tracheostomy**; would be helpful to minimize the need for sedatives and early weaning. However, too early tracheostomy or transfer of patient to theatre for tracheostomy and bronchoscopy during percutaneous procedures may expose others unnecessarily.
- **ECMO** centers, if available should be alerted early for those who are having refractory hypoxaemia even after trial of prone ventilation.
- **Early mobilization** ; those who are mechanically ventilated for more than 24 hours should be carefully assessed and started on chest and limb physiotherapy in order to prevent ICU acquired weakness.
- **Weaning**; progress should be assessed using regular ABGs and CXR to wean ventilator supports and liberate patients from the mechanical ventilation. It may be appropriate to wean patients and extubate early to NIV or high flow nasal oxygen in order to reduce the complications of prolonged ventilation.
- **Communication**; do not use personal mobile phones during duty hours. Availability of a dedicated smart phone and intercom facilities in cohort or triage ICU is important to improve communication and to prevent frequent staff movements.

5.7 SEPSIS AND SEPTIC SHOCK

Sepsis denotes the predominant failure in perfusion, associated with dysregulated host immune response to COVID 19 infection leading to life threatening organ dysfunction .

In septic shock, persisting hypotension (MAP < 65 mmHg) or serum lactate level >2 mmol/L is seen despite adequate volume resuscitation.

5.7.1 MANAGEMENT OF CIRCULATORY SHOCK

Circulatory shock is a life-threatening situation characterized by alteration in **tissue oxygen delivery and/or capacity to use oxygen**, giving rise to tissue dysoxia. Exploration of the **type & cause of shock** requires a consideration of broad differentials and thorough evaluation. Septic shock, a form of distributive shock, is the commonest form of circulatory shock among patients with COVID 19 infection admitted to critical care. However, some patients will have components of more than one type (mixed shock).

1. **Fluid responsiveness**, as the key to guide resuscitation should be assessed in sepsis and other types of shock. Multiple parameters eg; MAP, UOP, lactate level, base deficit, should be incorporated to improve the accuracy of assessment.
2. **Resuscitation goals /end points** should be defined eg: fluid balance, CVP, IVC collapsibility for the haemodynamic resuscitation
 - In case of shock, hemodynamic resuscitation measures should be adopted immediately, and the established management goals should be reached **as quickly as possible** (ideally in first 3h).
 - The first step in hemodynamic resuscitation is to quickly reach and maintain minimum acceptable tissue perfusion pressure (PP), defined as **MAP $\geq$ 65mmHg**.
 - Once PP has been secured, the tissue dysoxia should be corrected, defined as the restoration of normal global hypoxia tissue marker values: **ScvO₂ $\geq$ 70%** (or SvO₂ $\geq$ 65%), and/or **lactate levels**.
3. Fluid therapy in critically ill takes four phases; **SOSD**.
 - **Salvage phase** (*rapid boluses within minutes*) focuses on achieving a BP and cardiac output within minutes, compatible with immediate survival and performing lifesaving procedures to treat the underlying cause of shock.
 - **Optimization phase** (*fluid challenges within hours*) focuses on promoting cellular O₂ availability and monitoring cardiac output, mixed venous oxygen saturation (SvO₂), and lactate levels.
 - **Stabilization phase** (*maintenance fluids*) focuses on preventing organ dysfunction, even after hemodynamic stability has been achieved. This phase typically last from hours to days.
 - **De-escalation phase** (*diuretics/HD*) focuses on weaning the patient from vasoactive agents and providing treatments to help achieve a negative fluid balance.

One need to carefully assess the phase of fluid therapy to determine whether patient needs fluid loading, maintenance or fluid removal to improve vital organ perfusion. It is important to remember

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that some patients may present during optimization or stabilization phase and other might revert back to initial stages requiring escalation of haemodynamics supports during latter part of the illness.

5.8 RENAL REPLACEMENT THERAPY (RRT)

Acute kidney injury is defined by the acute rise of serum creatinine or rapid onset oliguria overwhelming the renal capacity to handle the solute and volume load. It is estimated that approximately 20% of the critically ill patients with COVID 19 infection may progressed to acute kidney injury.

1. **Availability of RRT;** It is essential that renal replacement therapy eg; CRRT or HD should be available onsite in the institutions, where critically ill COVID 19 cases are admitted. Otherwise, the high risk transfers for RRT at another hospital is not justifiable considering the relatively poor outcome of patients with KI and the risk to others.
2. **Indications for RRT;** RRT specially the continuous renal replacement therapy is not only resource but labor intensive. Therefore, CRRT has to be reserved for patients with favorable outcomes. RRT has to be considered in patients with progressive multiorgan failure not limited to those who develop AKI with
 - a. Refractory acidosis
 - b. Refractory hyperkalaemia
 - c. Refractory fluid overload
 - d. Uraemic complications**Vascular access;** Right internal jugular line has to be used as the first line for vascular access and always chest X ray should be examined for the vascath position before starting RRT.
2. **SLEDD** (sustained low efficiency daily dialysis) which is more affordable and less labor intensive should be attempted over CRRT in those with AKI even dependent on vasoactive medications.
3. **CRRT dose** (volume based) is 20-25 ml/Kg/h. CRRT is less likely to be successful when the ICU staff is not well trained as therapy delivery should always be titrated and continued without interruption for 48-72 hours.
4. **Circuit life;** whenever CRRT is started, principle challenge is to extend the circuit life. Circuit life in CRRT is mainly affected by vascath position, blood flow rate, ultrafiltration and anticoagulation.
5. **De-escalation;** CRRT can be switched as the patient improves (better solute control, resumption of urine output and haemodynamic stability) initially to SLEDD and subsequently to HD if needed.

5.9 STAFF WELLBEING

Medical staff will be under both physical and psychological pressure, while facing this potentially large-scale infectious public health event. Therefore early measures to address burn-out would ensure better service is being delivered during this difficult period and keeping the staff safe.

1. Keep prepared and to mobilize additional staff (doctors, nurses and support staff) when the crisis is escalating
2. Train staff on donning, doffing, prone ventilation and communication modes regularly.
3. Limit and minimize extended duty hours more than 24 hours. (May not be able to give 1:1 care)
4. Make sure staff gets an adequate rest, meals, toilets and sleep for which dedicated areas should be identified
5. Screen staff regularly for symptoms of COVID 19 or other illnesses
6. Arrange communication means to contact family and friends on regular basis.
7. Hospital security staff should be available to be sent to help deal with uncooperative patients.
8. Leisure activities and training on how to relax may be arranged to help staff reduce stress.
9. Psychological counselors regularly visited the rest area to listen to difficulties or stories encountered by staff at work, and provide support accordingly.
10. Avoid patients' visitors at any time inside the ICU.

KEY POINTS to be considered in ICU care:

- stigma among staff
- IPC protocols
- specific procedures
- therapeutic approaches

See Annexure for the LIST OF DRUGS AND EQUIPMENT FOR MANAGEMENT OF CRITICALLY ILL PATIENTS WITH COVID-19

6 MANAGING HIGH-RISK PATIENTS

6.1 COVID-19 infection in pregnancy

Pregnant women do not appear to be more susceptible to the consequences of corona virus than the general population. There is no evidence that the virus can pass to the baby during pregnancy.

As a precautionary approach pregnancy women with suspected or confirmed COVID-19, when they go into labour are being advised to attend an obstetric unit with specialist cover with isolation facilities. At the moment there is no evidence that the virus can be carried in the breast milk. Therefore, benefits of breastfeeding outweigh any potential risk of transmission of corona virus through breast milk.

Pregnant women with suspected, probable, or confirmed COVID-19, including women who may need to spend time in isolation, should have access to obstetric, fetal medicine and neonatal care, as well as mental health and psychosocial support, with facilities to care for any maternal and/or neonatal complications.

Mode of birth should be based on obstetric indications.

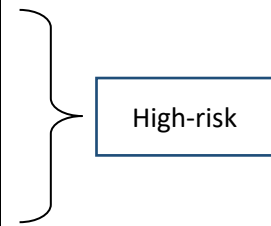
Please note that this information is subjected to further evidence based with more experience.

6.2 COVID-19 care for older patients with COVID-19

Overall mortality reported as approx. 1-2% of infected persons. While the case fatality among hospitalized patients is reportedly around 15%.

Table: Who is at risk of dying from COVID-19

Age (yrs)	No. of Deaths	%
0 – 9 years	0	0
10-19	1 in 500	0.2
20-29	1 in 500	0.2
30-39	1 in 500	0.2
40-49	1 in 250	0.4
50-59	1 in 76	1.3
60-69	1 in 27	3.6
70-79	1 in 12	8.0
80+ years	1 in 6	15



Older adults (above 50 years of age) with serious medical conditions e.g. heart disease, diabetes, lung disease are at higher risk to become very sick from the COVID -19 infections.

Suspected/Probable (awaiting diagnosis) cases of COVID -19 (who are probably in self-isolation), if faced with a medical/ surgical or obstetrics emergency should be first assessed for COVID 19 infection and concurrently transferred/ referred to the relevant specialty clinic/ unit immediately for appropriate care. Necessary arrangements should be made in the clinic/ ward to attend to them immediately/ as a priority basis to limit their waiting time.

7 AUTOPSY PRACTICE AND DISPOSAL OF DEAD BODY

COVID-19 related deaths could be categorized arbitrarily into 4 groups;

Category I

Death following **confirmed** Corona Viral Infection (COVID-19).

- Method of disposal
 - Minimum handling
 - No external examination
 - Viewing of the body only by close relative/s is allowed in a pre-designated area in hospital
 - No embalming/No autopsy
 - Place the body in a body bag and seal
 - Body should not be viewed after sealing
 - Funeral undertaker should place sealed body bag in a coffin for transportation (coffin should be preferably sealed)
 - Cremate within 24 hours without taking home

In case of death occurring in the ward /ICU /ETU;

- Only use designated body bags or a suitable alternative
- The dead body should be handled by the attending ward staff and put in the body bag and kept in a pre-designated place.
- If the death occurred in ICU, the body should be removed from the machines and placed in a pre-designated area.

CONDUCTING OF AN INQUEST IS NOT ESSENTIAL

Cremation should be under the supervision of MOH/ PHI along with area police.
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Category II

Death following **suspected** Corona Viral Infection (awaiting laboratory confirmation)

- Method of disposal
 - Minimum handling
 - External examination only
 - Nasal swab, throat swabs, tracheal aspirate and femoral blood sample (centrifuged) to be collected to be sent for analysis
 - Viewing of the body only by close relative/s is allowed in a pre-designated area in hospital
 - Place in a sealed body bag, cremation within 24 hours without taking home. No embalming.

In case of death occurring in the ward /ICU /ETU;

- Only use designated body bags * or a suitable alternative
- The dead body should be handled by the attending ward staff and put in the body bag and kept in a pre-designated place.
- If the death occurred in ICU, the body should be removed from the machines and placed in a pre-designated area.

AN INQUEST MAY BE REQUIRED

Cremation should be under the supervision of MOH/ PHI along with area police.

Category III

Death following possible Corona Viral Infection with suggestive history and clinical findings.

- Method of disposal
 - Minimum handling
 - External examination only
 - Nasal swab, throat swabs, tracheal aspirate and femoral blood sample (centrifuged) to be collected to be sent for analysis
 - Viewing of the body only by close relative/s is allowed in a pre-designated area in hospital
 - Place in a sealed body bag, cremation within 24 hours without taking home. No embalming

In case of death occurring in the ward /ICU /ETU;

- Only use designated body bags or a suitable alternative
- The dead body should be handled by the attending ward staff and put in the body bag and kept in a pre-designated place.
- If the death occurred in ICU, the body should be removed from the machines and placed in a pre-designated area.

AN INQUEST MAY BE REQUIRED

Cremation should be under the supervision of MOH/ PHI along with area police.

Category IV

Death due to pneumonia unlikely to be due to corona viral infection

- Method of disposal.
 - External examination. Better not to open body cavities.
 - Nasal swab, throat swabs, tracheal aspirate and femoral blood sample (centrifuge) to be collected to be sent to MRI.
 - If necessary, do true cut lung biopsy.
 - Routine disposal.

DEATH OF FOREIGN NATIONALS following diagnosed Corona Viral Infection.

- Disposal same as category-I
- Hospital authority should inform the Ministry of Health officials to contact the relevant embassy for the cremation in Sri Lanka.

DEATH OF FOREIGN NATIONALS due to other causes (e.g. RTA) with possible exposure to Covid-19.

- Disposal same as category II.
- Hospital authority should inform the Ministry of Health officials to contact the relevant embassy for the cremation in Sri Lanka.

AN INQUEST MAY BE REQUIRED

In case of any suspected criminality of COVID19 infected patient under category I, II or III – partial or full autopsy may have to be performed with necessary IPC on a case by case basis by Consultant JMO.

Sample dispatch to MRI - Please refer to Chapter 3 or Health Ministry guidelines.

The hospital authorities should formulate a methodology to expedite the reports delivering system from MRI to JMO's.

The post mortem handling **should be done by the senior-most JMO** with the senior morgue attendants.

Supervision of disposal until cremation should be done by MOH/ PHI along with area police.

Protective equipments/items to be provided to all consultant JMO stations.

1. Body bags
2. Disinfectants
3. Necessary PPE

SPECIAL INSTRUCTIONS

1. It is better not to use enclosed air conditioner systems inside morgues until corona threat is over.
2. Better to avoid using electric saws at PM to minimize splashing of droplets.
3. During disposal from autopsy room, it will be beneficial to apply some hypochlorite solution over the body bag/ polythene wrapping.
4. If a patient admitted to hospital from a quarantine center, the authority for autopsy may come from the magistrate.

8 OUTBREAK RESPONSE PLAN FOR HOSPITALS

This is an Interim plan for Institutional management of COVID-19 infection.

Activate hospital **Operation Cell** which is an integral component of disaster management plan already in place in the health care institutions.

Key functional areas of the operation cell:

1. Should Update the hospital administration and clinical staff on the guidelines provided, share essential elements of local daily situation report.
2. Provide continuous risk communication (**especially health education to health staff**) and technical information to the health staff on the infection control measures to minimize the institutional spread of COVID 19.
3. Continuous assessment of the availability of PPE, face masks and hand sanitizers in the institution.
4. Ensure the availability of guidelines on proper utilization of such items by the hospital staff.
5. Coordinate with the national and regional Medical Supplies Division through the regional epidemiologist (RE) and collect the adequate amount of such items.
6. Maintain an inventory with dedicated storage facility and ensure continuous availability supply of such items.
7. In case of impending scarcity, coordinate with district focal points to introduce approved alternative equipment.
8. Continuous situation analysis and make necessary amendments to institutional preparedness activities based on varying local and international epidemic scenarios.
9. Ensure availability of transport (ambulance) facility of COVID 19 suspected patient to the identified health facility for isolation, confirmation and management. Educate the ambulance driver and helper on appropriate measures during transportation.
10. Measures should be taken to establishing of hand washing facilities at the hospital entrance and OPD. Continuous monitoring of adherence to such practices among staff and hospital attendees.
11. Strengthen the information hub to communicate the information on the hospital attendees with travel history to the relevant MOOH for 14 days quarantine procedure. Information on daily update on the suspected/isolated/and or transferred patients to the regional epidemiologist and area MOOH.
12. Any other emergency activity where collective decision making is necessary

Human resource:

Technical team and the supportive staff for the coordination cell should be appointed by the head of the institution.

Technical team:

- Multi-disciplinary expert team composed of Consultant microbiologist/ Physician or any representative from the clinical team; e.g. Respiratory Physician, Intensivist, Virologist based on the availability (for overall technical guidance)
- MO public health (for overall coordination with internal and district authorities)
- Hospital matron of nurse in charge (for assistance in monitoring and supervision of hospital infection control activities)
- Infection control unit – medical officer and nursing officer

Supportive staff:

- Accountant.
- Administrative officer.
- Divisional pharmacist.
- RMO who has an experience with logistic management.
- Two development officers (one for surveillance and other for information management).
- Transport officer.
- Office assistance (SKS)

Logistics:

Ensure the continuous availability of basic requirements such as physical location, internet facilities, computers, printers and multi-media equipment which are already in place.

Annexures

Annexure 1 - List of designated hospitals and laboratories (DGHS letter)

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Ministry of Health and Indigenous Medical Services

Director/ Medical Superintendent

Teaching Hospital/ Provincial General Hospital/ District General Hospital/ Base Hospital

PCR TESTING FOR COVID-19

Please note that in addition to the Medical Research Institute, PCR testing for COVID-19 infection has been established at virology laboratories at National Hospital Kandy and Teaching Hospitals Karapitiya and Anuradhapura. Accordingly, it is decided to assign each of the following hospitals to one of these facilities, decentralizing PCR testing for COVID-19.

Hereafter, all samples for this testing should be sent to the designated laboratory only. Sending duplicate samples from single patient to any other laboratory except to the designated laboratory mentioned below should be avoided.

Institution	Designated Laboratory
1 National Institute of Infectious Diseases	Medical Research Institute
2 National Hospital of Sri Lanka	Medical Research Institute
3 Lady Ridgeway Hospital for Children	Medical Research Institute
4 Castle Street Hospital for Women	Medical Research Institute
5 Base Hospital Mulleriyawa	Medical Research Institute
6 North Colombo Teaching Hospital	Medical Research Institute
7 District General Hospital Negombo	Medical Research Institute
8 District General Hospital Gampaha	Medical Research Institute
9 National Hospital Kandy	National Hospital Kandy
10 Teaching Hospital Karapitiya	Teaching Hospital Karapitiya
11 District General Hospital Hambantota	Teaching Hospital Karapitiya
12 Teaching Hospital Jaffna	Teaching Hospital Anuradhapura

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 385, Rev. Badddegama Wimalawansa Thero Mawatha, Colombo 10, Sri Lanka.

Institution	Designated Laboratory
13 Teaching Hospital Batticaloa	National Hospital Kandy
14 Teaching Hospital Anuradhapura	Teaching Hospital Anuradhapura
15 Provincial General Hospital Kurunegala	National Hospital Kandy
16 Provincial General Hospital Badulla	National Hospital Kandy
17 Teaching Hospital Ratnapura	Medical Research Institute

Dr Anil Jasinghe
Director General of Health Services

Dr. Anil Jasinghe
Director General of Health Services
Ministry of Health & Indigenous Medicine Services
"Suwasiripaya"
385, Rev. Baddagama Wimalawansa Thero Mawatha,
Colombo 10.

cc: Secretary Health
Deputy Director General (Laboratory Services)
Deputy Director General (Public Health Services) -1
All Provincial Directors of Health Services
All Regional Directors of Health Services
Director Medical Research Institute
Consultant Virologist – MRI, NH Kandy, TH Karapitiya/ Anuradhapura

Annexure 2 - LIST OF EQUIPMENT AND DRUGS FOR MANAGEMENT OF CRITICALLY ILL PATIENTS WITH COVID-19

A. Infection control

1. PPE; N95 masks, surgical masks, overalls, visors, goggles
2. Parasaft (high level disinfectants)
3. 70% alcohol and TCL (low level disinfectants)
4. Hand wash stations
5. Hand wash solutions
6. Hand rubs

B. Monitoring devices

1. Multipara monitors
2. Pulse oximeters
3. Thermometers (infra-red)
4. Urine bags
5. ABG analyser
6. Glucometers
7. Portable X-ray

C. Organ support devices

1. ICU ventilators (1 per bed)
2. Portable ventilators (1 per 5 beds)
3. HFNC machines with accessories
4. Infusion pumps
5. CRRT machines
6. Haemodialysis machine
7. Syringe pumps
8. Pneumatic compression devices
9. Feeding pumps (NG)

D. Consumables

1. Endotracheal tubes (sizes 7 -8.5)
2. HMEs
3. Breathing circuits- disposable
4. Bacterial and viral filters for ventilator
5. Closed suction devices for ventilator
6. Suction apparatus with Yankel handle
7. Nasogastric tubes (12-16 FG)
8. Urinary catheters (12-18 FG)
9. Urine bags
10. Syringes (1-50 cc)
11. Cannulae (14-22 G)

12. Central venous catheters (15-20 cm)
13. Tri-lumen vascath (15- 20 cm)
14. CRRT solutions (Duosol K-2)
15. CRRT kits (machine specific)
16. Haemodialysers (high flux)
17. Dialyser solutions (? bicarb based)

E. Drugs (IV)

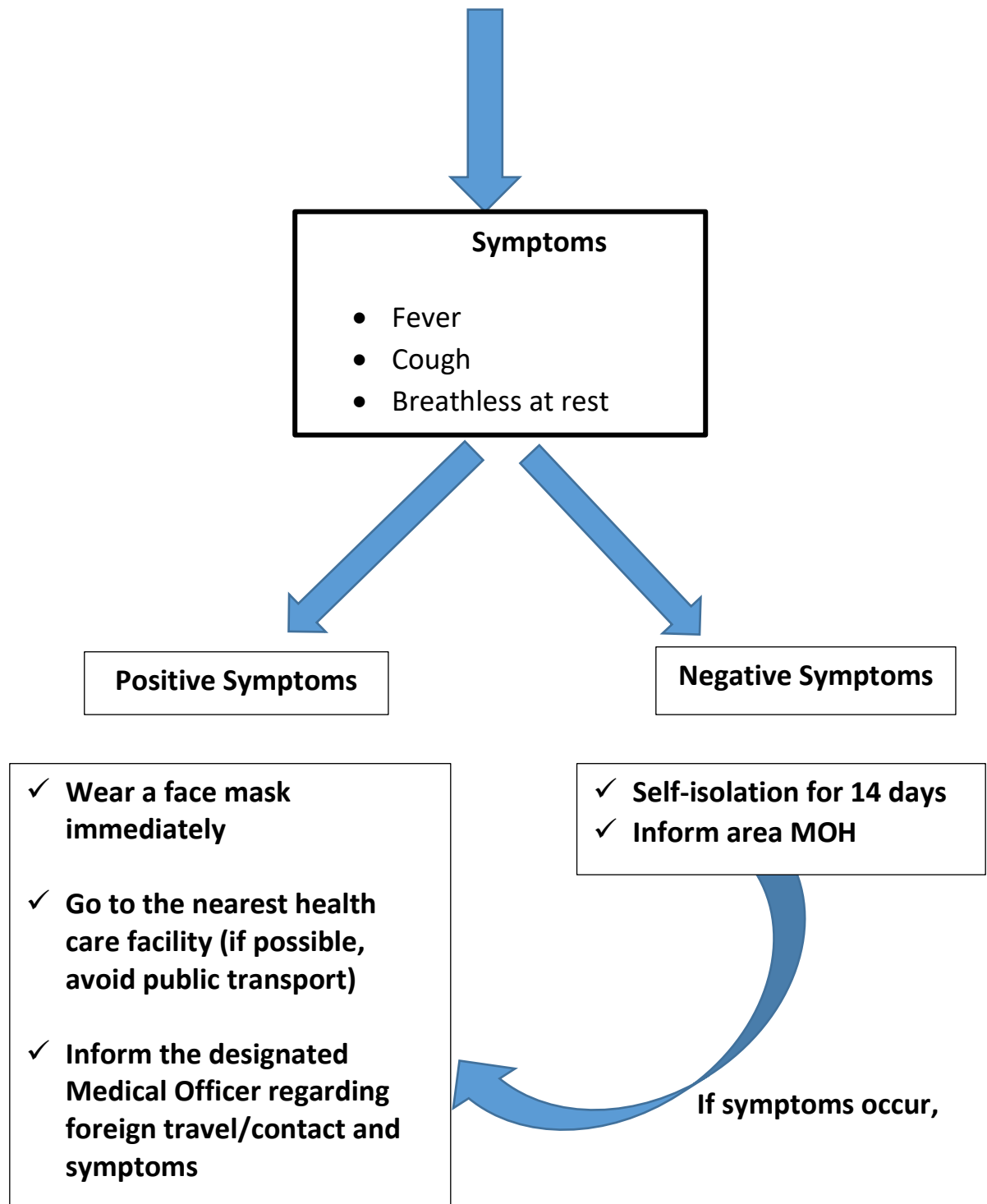
1. Fentanyl vials
2. Morphine vials
3. Propofol 1%
4. Midazolam
5. Rocuronium
6. Suxamethonium
7. Atracurium
8. Vecuronium
9. Glycopyrrate
10. Adrenalin vials
11. Noreadrenalin vials
12. Atropine vials
13. Dobutamine vials
14. Vasopressin vials
15. Ephedrine vials
16. Antibiotics
17. Insulin (actrapid)
18. Amiodarone IV
19. Amiodarone oral
20. Thiamine vials
21. Ranitidine vials
22. Enoxaparin
23. Heparin vials
24. Haloperidol
25. KCL (potassium chloride)
26. MgSO₄
27. Crystalloids (saline, RL, dextrose, 50%)
28. Lignocaine 2%
29. Nebuliser solutions (salbutamol)

Annexure 3 - Quick risk assessment check list for first contact level

Age: <50 yrs ☐ 50-70 ☐ > 70 ☐	1. Has come from a from abroad (ANY COUNTRY) within 14 days prior to onset of symptoms ☐	2. Had contacts with a confirmed case of COVID19 ☐	Co-morbidities - COPD ☐ - Hypertension ☐ - IHD ☐ - DM ☐ - Chronic renal failure ☐ - Chronic Liver Diseases ☐ - Pregnancy ☐ - Other _____ ☐				
Presenting complaints		Clinical Assessment					
Symptoms	Duration		Mild		Moderate		Severe
- Fever ☐ - Cough ☐ - Breathlessness ☐ - Other _____	_____ _____ _____ _____	Pulse rate	<100		100-120		>120
		Respiratory rate	12-20		20-30		>30
		O2 saturation	<94		90-94		<90

Annexure 4 - Public instruction flow chart for hospitals receiving suspected COVID-19 patients

- A person with a recent foreign travel (ANY COUNTRY) history ≤14 days
- A person who has been in **close contact** with a confirmed or suspected COVID 19 infected patient (Close contact- a person staying in an enclosed environment e.g.: same house hold/workplace/social gatherings/travelling in same vehicle)



Annexure 5 - Guidance on use of PPE

Guidance on the rational use of personal protective equipment (PPE) in hospitals in the context of COVID-19 disease

The rational use of PPE is a key measure to protect healthcare workers and prevent transmission of COVID-19 in healthcare settings.

This document outlines the recommendations for the rational use of PPE in hospitals in the current context.

In addition to using the appropriate PPE, frequent hand hygiene and respiratory hygiene should always be performed. Healthcare workers should discard PPE in an appropriate waste container after use and perform hand hygiene before donning and after doffing of PPE.

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Healthcare facilities			
Triage*	Healthcare workers	Preliminary screening not involving direct contact.	Maintain spatial distance of at least 1 m. Surgical mask
	Patients with respiratory symptoms.	Any activity	Maintain spatial distance of at least 1 m. Provide surgical mask.
	Patients without respiratory symptoms	Any activity	No PPE required
Waiting areas until transfer (in hospitals where inpatient facilities are not available and patients awaiting transfer to designated hospitals)	Suspected cases of COVID 19	Any activity	Provide surgical mask Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1m from other patients.
Areas of patient transit (e.g., wards, corridors) ¹	All staff, including healthcare workers.	Any activity that does not involve contact with COVID-19 patients.	No PPE required
	All staff, including healthcare workers.	If involved in patient transfer	Surgical mask or and gloves

¹ (Have a designated route for the transport of patients within the hospital. Before transporting the patient, inform the destination unit of the patient's transfer. Make arrangements to clear the route of transport within the hospital (making announcement over the public address system or through staff). Make sure the patient is given a surgical mask.

Patient room ²	Healthcare workers	Providing direct care to COVID-19 suspected or confirmed patients.	NIOSH approved N-95 mask Impermeable isolation gown Two pairs of gloves Eye protection (goggles or face shield) Surgical hood or Cap Covered shoes and fluid resistant shoe cover or boots
		Aerosol-generating procedures performed on COVID-19 patients.	NIOSH approved N95 mask or FFP2 standard, or equivalent. Impermeable isolation gown Two pairs of gloves Eye Protection Apron Surgical Hood Covered shoes and fluid resistant shoe cover or boot
	Cleaners	Entering the room of COVID-19 patients.	NIOSH approved N-95 mask or surgical masks Fluid resistant gown Heavy duty gloves Eye protection Boots or closed work shoes and shoe covers Surgical cap or surgical Hood (Masks and eye protection can be shared between rooms of confirmed cases or between rooms of suspected cases)
	Visitors ³	Entering the room of a COVID-19 patient	Surgical mask Gown Gloves
Laboratory and biosafety cabinet	Lab technician	Manipulation of respiratory samples.	Surgical mask Fluid resistant gown Gloves Eye protection

***Triage of patients in the hospital**

² If cohort isolation of suspected cases of COVID 19 is practiced, the same set of PPEs should be used for all patients.

³ Visitors should not be allowed. If visitors must enter a COVID-19 patient's room, they should be provided with clear instructions about how to put on and remove PPE and about performing hand hygiene before putting on and after removing PPE; this should be supervised by a healthcare worker.

Administrative areas	All staff, including healthcare workers.	Administrative tasks that do not involve contact with COVID-19 patients.	No PPE required
Ambulance or transfer vehicle ⁴	Healthcare workers	Transporting suspected COVID-19 patients in the same compartment of the ambulance to the referral healthcare facility.	Surgical mask or NIOSH approved N95 mask Fluid resistant gowns Gloves Eye protection
	Driver	Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID-19 patient	Maintain spatial distance of at least 1 m. No PPE required
		Assisting with loading or unloading patient with suspected COVID-19 disease.	Surgical mask or NIOSH approved N95 mask Fluid resistant gowns Gloves Eye protection
		No direct contact with patient with suspected COVID-19, but no separation between driver's and patient's compartments	Surgical mask
	Patient with suspected COVID-19 disease.	Transport to the referral healthcare facility.	Surgical mask
	Cleaners	Cleaning after and between transports of patients with suspected COVID-19 disease to the referral healthcare facility.	Surgical mask Fluid resistant gown Heavy duty gloves Eye protection Boots or closed work shoes

⁴ Always use ambulances with two compartments (separate driver's area), if available.

1. Display a signage to direct patients with a recent travel history to countries/areas with COVID 19 within 14 days or with a contact history with someone who had travelled to such an area and developed symptoms or a person suspected/diagnosed with COVID 19
2. Display these signage in all the main languages at the entrance to the hospital building
3. Use a checklist to identify suspected cases of COVID 19 during the triage of patients. Inquire the following:
 - a. Travel history
 - b. Respiratory symptoms
 - c. Contact history
4. Refrain from performing a detailed clinical examination of suspected patients in the triage area unless medically indicated
5. Healthcare workers can wear the same PPE for a shift in the triage area

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