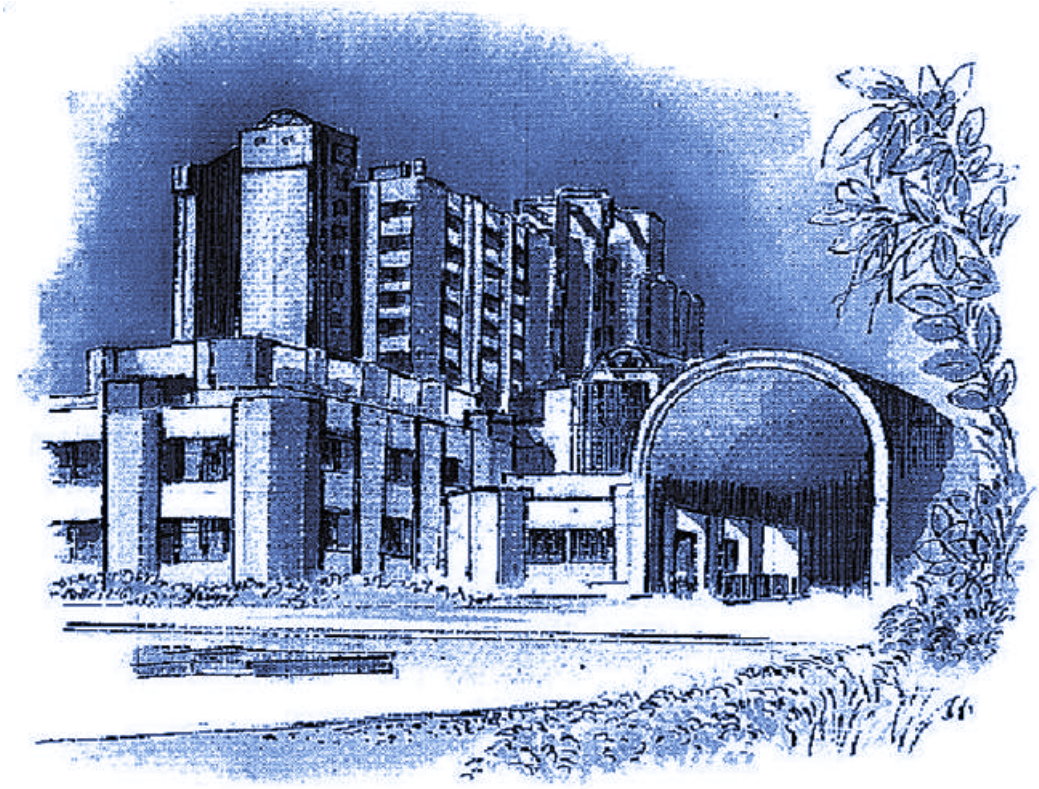
Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India



COVID – 19: THE PROTOCOL BOOK

Foreword

Emergence of novel **Corona virus disease- 2019 or COVID-19** at the beginning of the year 2020 has posed an unprecedented and overwhelming challenge to the health care providers all over the world. The COVID-19 pandemic has engulfed almost the whole world, compelling medical institutions, hospitals and health care systems to re-invent themselves, to provide appropriate care to COVID-19 patients and safeguard the medical personnel from getting infected themselves. SGPGIMS Lucknow was entrusted the job of creating the apex level-3 category Covid-care facility for the state of Uttar Pradesh by the government, a job that we have undertaken and completed in a very short span of time, by creating the ***"Rajdhani Covid Hospital" or RCH***. Unlike most other medical conditions that we are so used to managing based on pre-existing evidence based clinical practice guidelines, protocols had to be drawn up afresh for the care of COVID-19 patients, and organising various aspects of functioning of the RCH. Besides, an institute like ours has to continue managing a whole spectrum of patients with varied medical conditions who are not infected with COVID-19, but need to be safe-guarded against the same while undergoing treatment, for which too appropriate protocols were prepared and implemented. This mammoth job of creating protocols and implementing various aspects of care and services at SGPGIMS was entrusted to the ***SGPGI Covid task-force***, and the 17 teams or committees as part of it.

This ***COVID-19 protocol book*** has been compiled by the members of the SGPGI Covid task-force and other faculty members of the institute. This protocol book can work as a ready recknoner of the clinical protocols, including the ICU protocols being used for management of COVID-19 patients, their pre- hospital screening, transportation, admission and discharge, and all other aspects of managing the services and care of these patients at SGPGIMS and RCH. This protocol book also provides a concise account of protocols and SOP's we are using for organising the work in non-COVID areas of our hospital. These protocols are dynamic ones, having undergone number of changes and modifications, and will undergo further changes in coming weeks and months, owing to new information and guidelines from various regulatory bodies coming to light. Needless to say, a lot of work has gone into organising and delivering care to COVID-19 patients at SGPGI, as also in compiling this protocol book, which has been done by a large number of committed faculty members and other cadres of the institute. I thank all of them, for compiling this useful compendium which can guide care of COVID-19 patients and organisation of services in various hospitals and settings elsewhere in the country.

Prof Radha Krishan Dhiman
Director SGPGIMS Lucknow, Chairman, SGPGI Covid Task-force

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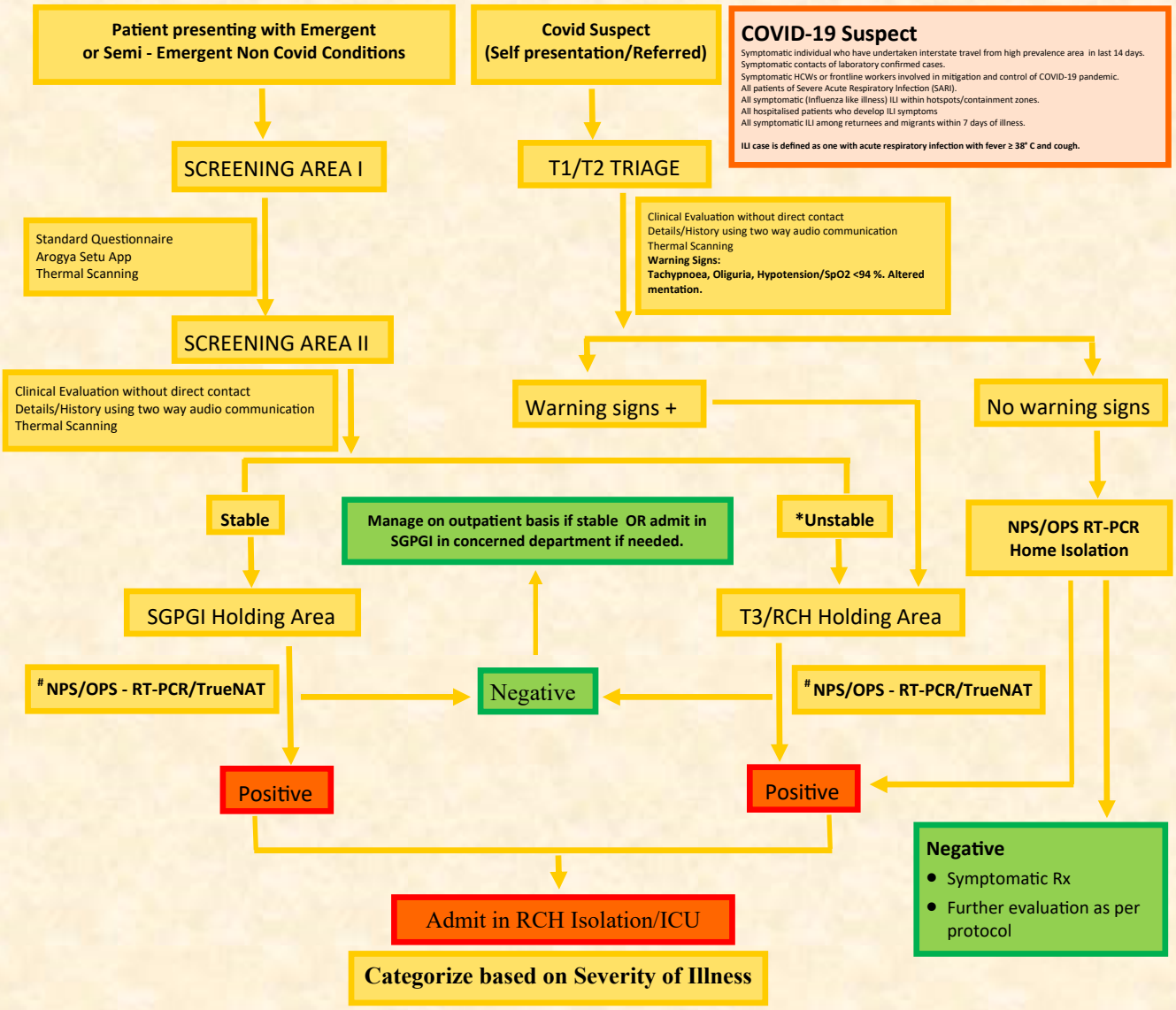
COVID-19 Management Protocol
SGPGIMS, Lucknow
Version 1.3.1

August 20, 2020



Categorize based on Severity of Illness

Mild	Moderate	Severe
Fever, Mild URTI **No dyspnoea,**	**Pneumonia with no signs of severe disease** **RR ≥ 24/ min, SPO2 ≤ 94 % on Room Air**	**Respiratory distress requiring assisted vent.** **RR ≥ 30/min, SPO2 ≤ 90% on Room Air**

• Admit in Isolation Ward
• Contact and Droplet precautions
• Strict hand hygiene
• Tab. Hydroxychloroquine (400mg) BD on 1st day followed by 200mg 1 BD for 4 days for patients with high risk of severe disese[1]. (after ECG Assessment) with Tab Azithromycin 500 mg OD x 5 days
OR
• Tab Ivermectin 12mg OD x 3day s with Tab Doxycycline 100 mg BD x 5 days
OR
• Tab. Favipirivir 1800mg BD on Day 1, followed by 800mg BD x 13 days
• Tab. Vit C 500mg BD
• Tab Zinc 50mg BD
• Symptomatic treatment for cough and fever (bronchodilators, mucolytic, paracetamol)
• Monitor closely for warning signs
  ◦ Chest pain, dyspnoea
  ◦ Tachypnoea, cyanosis, altered mentation
	• Admit in ICU/HDU
	• Oxygen Support through nasal cannulae
	• Target SpO2: 92-96% (88-92% in COPD).
	• Awake proning as a rescue therapy.
	• All patients should have daily 12-lead ECG
	• Follow CRP, D-dimer & Ferritin, Fibrinogen, Procalcitonin every 48-72 hourly; CBC, KFT/LFT daily
	• Inj. Remdesevir 200 mg IV on Day 1 followed by 100mg OD for 4 days
	• Consider IV methylprednisolone 0.5 - 1 mg/kg or dexamethasone 0.1- 0.2 mg/kg for 7 - 10 days (within 48 hours of admission or if oxygen requirement is increasing and if inflammatory markers are increased)
	• Prophylactic dose of UFH[2] or LMWH[2] (e.g., enoxaparin 40 mg per day SC)
	• Inj. Thiamine 100 mg IV OD, Inj. Vit C 1.5gm IV 6 hourly
	• Antibiotics if suspecting infection according to llocal policy
	• Control of co-morbid condition.
	• **Monitor for: Increased WOB, Hemodynamic instability , Increase in oxygen requirement**
		• Cautious trial of CPAP/NIV, HFNC to avoid intubation
		• Inj. Remdesevir 200 mg IV on Day 1 followed by 100mg OD for 4 days
		• IV methylprednisolone 1.0 to 2 mg/kg or dexamethasone 0.1- 0.2 mg/kg for 7 - 10 days if not already given (To be tapered over 2 - 4 weeks depending on radiological involvement and clinical recovery)
		• Therapeutic dose of UFH or LMWH (after excluding coagulopathy or thrombocytopenia or high risk of bleeding[3]
		• Inj. Thiamine 100 mg IV OD, Inj. Vit C 1.5gm IV 6 hourly
		• Monitor inflammatory markers daily
		• ** Inj. Tocilizumab or Methylprednisolone pulse for Mx of Cytokine storm and ARDS (Off Label, Individualise))
		• Mechanical ventilation if unable to maintain saturation, increased work of breathing or development of hemodynamic instability
		  ◦ Conventional ARDS Net strategy
		  ◦ Proning, recruitment manoeuvres
		• Management of septic shock as per SSC guidelines and local antibiotic policy
		• Convalescent Plasma (Under Trial Setting) or rescue therapy on compassionate grounds

Testing
While attending suspect case as per above protocol based on clinical assessment, testing shall be resorted to and if negative—manage in Non-Covid facility according to clinical diagnosis

Discharge
After clinical improvement, discharge according to state discharge policy

1. High risk patients for Severe Disease
   - Age > 60 years
   - HTN, Diabetets Mellitus and other immunocompromising conditions.
   - Chronic lung, kidney or liver disease
   - Cerebrovascular disease
   - Obesity BMI > 25 kg/m^2

2. LMWH: Low Molecular Weight Heparin: if no contraindication or high risk of bleeding: UFH: Unfractionated Heparin
3. Risk of Bleeding: Use validated score for assessing bleeding risk (e.g. HAS-BLED Score), Use D-Dimer and SIC for further risk stratification (SIC score ≥ 24 portends high thrombotic risk)

* **Apply Emergency Severity Index (ESI): ESI: 1-2—Unstable, ESI: 3—Borderline, ESI: 4-5—Stable**
\# **Nasopharyngeal/Oropharyngeal Swab**
** **Informed consent mandatory before use of off label drugs.**

Source: MoHFW/ICMR

COVID -19: CLINICAL MANAGEMENT PROTCOL

Background

Coronaviruses are large group of viruses that cause illness in humans and animals. Rarely, animal coronaviruses can evolve and infect people and then spread between people such as has been seen with MERS and SARS. The outbreak of Novel coronavirus disease (COVID-19) was initially noticed in a seafood market in Wuhan city in Hubei Province of China in mid-December, 2019, has now spread to 214 countries/territories/areas worldwide. WHO (under International Health Regulations) has declared this outbreak as a "Public Health Emergency of International Concern" (PHEIC) on 30thJanuary 2020. WHO subsequently declared COVID-19 a pandemic on 11th March, 2020.

Disease Epidemiology

Current available evidence for COVID-19 suggests that the causative virus (SARS-CoV-2) has a zoonotic source closely related to bat-origin SARS-like coronavirus. It is an enveloped RNA beta coronavirus related to the Severe Acute Respiratory Syndrome (SARS) virus, and the virus has been shown to use the angiotensin-converting enzyme 2 (ACE2) receptor for cell entry.

The persons infected by the novel coronavirus are the main source of infection. Direct person-to-person transmission occurs through close contact, mainly through respiratory droplets that are released when the infected person coughs, sneezes, or talks. These droplets may also land on surfaces, where the virus remains viable. Infection can also occur if a person touches an infected surface and then touches his or her eyes, nose, or mouth.

The median incubation period is 5.1 days (range 2–14 days). The precise interval during which an individual with COVID-19 is infectious is uncertain. As per the current evidence, the period of infectivity starts 2 days prior to onset of symptoms and lasts up to 8 days. The extent and role played by pre-clinical/ asymptomatic infections in transmission still remain under investigation.

Pathophysiology

Most patients with COVID-19 predominantly have a respiratory tract infection associated with SARS-CoV-2 infection. However, in a small proportion of cases, they can progress to a more severe and systemic disease characterized by the Acute Respiratory Distress Syndrome (ARDS), sepsis and septic shock, multiorgan failure, including acute kidney injury and cardiac injury.

Autopsy findings in China and European countries showed endothelial damage of pulmonary vasculature, microvascular thrombosis and hemorrhage linked to extensive alveolar and interstitial inflammation that ultimately result in COVID-19 vasculopathy, pulmonary intravascular coagulopathy, hypercoagulability, ventilation perfusion mismatch, and refractory ARDS. Hypoxemia, secondary to ARDS may also activate the coagulation cascade.

Case definitions

Suspect case

A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), AND a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset

OR

A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case in the last 14 days prior to symptom onset

OR

A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; AND requiring hospitalization) AND in the absence of an alternative diagnosis that fully explains the clinical presentation.

Probable Case

A suspect case for whom testing for the COVID-19 virus is inconclusive.

OR

A suspect case for whom testing could not be performed for any reason.

Confirmed Case

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

Clinical Features

Most common clinical features are:

1. Fever
2. Cough
3. Fatigue
4. Shortness of breath
5. Expectoration
6. Myalgia
7. Rhinorrhea, sore throat, diarrhea
8. Loss of smell (anosmia) or loss of taste (ageusia) preceding the onset of respiratory symptoms has also been reported

Older people and immune-suppressed patients in particular may present with atypical symptoms such as fatigue, reduced alertness, reduced mobility, diarrhoea, loss of appetite, delirium, and absence of fever. Children might not have reported fever or cough as frequently as adults. As per data from Integrated Health Information Platform (IHIP)/ Integrated Disease Surveillance Programme (IDSP) portal case investigation forms for COVID 19 (n=15,366), the details on the signs and symptoms reported are (as on 11.06.2020), fever (27%), cough (21%), sore throat (10%), breathlessness (8%), Weakness (7%), running nose (3%) and others 24%.

Risk factors for severe disease

1. Obesity
2. Age more than 60 years (increasing with age).
3. Underlying non-communicable diseases (NCDs): diabetes, hypertension, cardiac disease, chronic lung disease, cerebro-vascular disease, chronic kidney disease, immune-suppression and cancer.

Laboratory evaluation

In all patients following baseline investigations should be done:

1. CBC
2. Serum electrolytes, Liver function tests, Renal function tests
3. PT/INR, aPTT
4. Urine R/M
5. CXR

6. Electrocardiogram
7. Serum, Ferritin, CRP, LDH, Procalcitonin
8. Plasma Fibrinogen
9. Arterial blood gases (In patients having saturation < 94% on room air)

Classification of Severity:

The classification of severity is done on the basis of clinical and lab parameters:

1. **Category A – Mild disease**
    a. Patients with uncomplicated upper respiratory tract infection, may have mild symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache.
    b. Patients with RR < 20/ min, not requiring any oxygen supplementation (SpO2 > 96% on Room Air) and normal CXR.
    c. Laboratory criteria:
        (i) NLR < 3.2
        (ii) CRP < 40
        (iii) LDH < 300
        (iv) Ferritin < 500 mg/dl
        (v) D-dimers < 500ng/ml
        (vi) IL-6 < 5 times ULN
    d. CT criteria:
        (i) Less than 25% involvement of the lung parenchyma
2. **Category B – Moderate disease**
    a. Patients features in category A with dyspnoea with or without exertion
    b. Patients with RR > 24/min, SpO2 < 94% on Room Air
    c. CXR showing bilateral patchy homogenous/heterogenous opacities
    d. Laboratory criteria:
        (i) NLR > 3.2
        (ii) CRP – 40 – 125
        (iii) LDH – 300 - 400
        (iv) Ferritin – 500 - 800 mg/dl
        (v) D-dimers – 500 – 1000 ng/ml
        (vi) IL-6 – 5 - 10 times ULN

e. CT criteria:
   (ii) 25 - 75% involvement

3. Category C – Severe disease

a. Patients features in category A with dyspnoea at rest

b. Patients with RR > 30/min, SpO2 < 90% on Room Air

c. CXR showing bilateral diffuse homogenous/heterogenous opacities

d. Hemodynamic instability.

e. Presence of altered mentation.

f. Laboratory criteria:
   (i) NLR > 5.5
   (ii) CRP > 125
   (iii) Ferritin > 800 mg/dl
   (iv) D-dimers > 1000 ng/ml
   (v) IL-6 > 10 times ULN

g. CT criteria:
   (iii) More than 75% involvement of lung parenchyma

Basic Principles

1. Categorize into A, B, C based on Symptoms, SpO2 & Respiratory Rate
2. Supportive Care
   a. Finger Pulse Oximeter for continuous monitoring of Heart rate and Oxygen saturation
   b. Start oxygen with Mask at saturation of 94% or lower
   c. HFNC to be used if there is failed oxygen therapy and Non-invasive ventilation (NIV) to be used appropriately with two limb circuit expiratory filters.
   d. Counselling of COVID19 patients (By Counsellor/psychologist/psychiatrist)
   e. Normal feeding, no dietary restrictions, good oral hydration
   f. Maintenance IV fluids (If indicated)
   g. Maintain blood glucose levels <180 mg/dl.
   h. If Patient is on ACE inhibitors/ARBs, should be continued
   i. Avoid using NSAIDs other than Paracetamol Unless Absolutely Necessary

j. Antibiotic selection in case of superadded bacterial pneumonia should be according to institution antibiogram.

Management

Category A

Mild cases should be managed preferably at L1 facilities but early identification of at risk population should be done with detailed history for comorbidities listed in risk factors for severe disease.

1. Admit in Isolation Ward
2. Contact and Droplet precautions
3. Strict hand hygiene
4. Maintain adequate hydration
5. Pharmacological therapy
    - Tab. Hydroxychloroquine (400mg) BD on 1st day followed by 200mg 1 BD for 4 days for patients with high risk of severe disese1. (after ECG Assessment) with Tab Azithromycin 500 mg OD x 5 days

      OR

      Tab Ivermectin 12mg OD x 3day s with Tab Doxycy-cline 100 mg BD x 5 days

      OR

      Tab. Favipirivir 1800mg BD on Day 1, followed by 800mg BD x 13 days
    - Symptomatic treatment for cough and fever (bronchodilators, mucolytic, paracetamol)
    - Vitamin C 500mg BD PO
    - Zinc 50 mg BD PO
    - Prophylactic LMWH should be given to all patients if not contraindicated. (Enoxaparin 1mg/kg or Dalteparin 100 IU/kg)
6. Patients should be monitored for signs and symptoms of complications that should prompt urgent referral. Patients with risk factors for severe illness should be monitored closely, given the possible risk of deterioration. If they develop any worsening symptoms (such as mental confusion, difficulty breathing, persistent pain or pressure in the chest, bluish coloration of face/lips, dehydration, decreased urine output, etc.), they should be immediately admitted to HDU/ICU
7. Monitor inflammatory markers every 72 hours or if any sign of deterioration.

8. Children with mild COVID-19 should be monitored for signs and symptoms of clinical deterioration requiring urgent re-evaluation. These include difficulty in breathing/fast or shallow breathing (for infants: grunting, inability to breastfeed), blue lips or face, chest pain or pressure, new confusion, inability to awaken/not interacting when awake, inability to drink or keep down any liquids. If any of the above features are present child should be immediately transferred to ICU.

Category B

1. Admit to HDU/ICU
2. Contact and Droplet precautions
3. Strict hand hygiene
4. Maintain adequate hydration
5. Oxygen Support:
    1. Target SpO2: 92-96% (88-92% in patients with COPD)
    2. Oxygen supplementation should be started with nasal prongs. If unable to maintain saturation with up to 6litre/min high flow oxygen delivery systems should used such as:
        a. Venturi Mask
        b. Non rebreathing reservoir bag masks
        c. High Flow Nasal Cannula

    If HFNC or simple nasal cannula is used, N95 mask should be applied over it.

    3. **Awake proning may be used as a rescue therapy**.
        1. All patients should have daily 12-lead ECG undergoing awake proning
        2. Protocol for awake proning (Annexure 1).

Criteria to be fulfilled	**Avoid proning**
Patients with oxygen requirement of > 6L on nasal prongs or 10 – 12 L/min on venturi mask Patients on HFNC and NIV can be suggested intermittent lateral position Normal mental status Able to self-prone or change position with minimal assistance	Hemodynamic instability Close monitoring not possible

Patients will undergo a rotational change in position from prone to lying on each side to sitting up. Typical protocols include 30–120 minutes in prone position, followed by 30–120 minutes in left lateral decubitus, right lateral decubitus, and upright sitting

position.

6. Symptomatic treatment such as antipyretic (Paracetamol) for fever and pain, anti-tussives for cough.
7. High dose Vitamin C 1.5gm IV 6 hourly
8. Parenteral Thiamine 100 mg IV OD
9. Anticoagulation
    a. Prophylactic dose of UFH or LMWH (e.g., enoxaparin 40 mg per day SC)
    Contraindications: End stage renal disease, active bleeding, emergency surgery
    Consider unfractionated heparin in ESRD
10. Corticosteroids
    a. Consider IV methylprednisolone 0.5 to 1 mg/kg OR Dexamethasone 0.1 to 0.2 mg/kg for 3 days (preferably within 48 hours of admission or if oxygen requirement is increasing and if inflammatory markers are increased). Review the duration of administration as per clinical response.
11. Anti-virals
    a. Inj. Remdesivir 200 mg on Day 1 followed by 100mg daily from Day 2 – 4 (under EUA)
12. Control of co-morbid condition
13. Follow up CRP, D-dimer & Ferritin every 48-72 hourly (if available); CBC with differential count, Absolute Lymphocyte count, KFT/LFT daily.
14. Consider anti-inflammatory therapy with anti-IL-6 if Ferritin ot IL-6 doubles within 24 hours along with clinical and physiological signs of deterioration after ruling out clinically significant secondary bacterial or fungal infection
15. Monitor for:
    a. Increased work of breathing (use of accessary muscles)
    b. Hemodynamic instability
    c. Increase in oxygen requirement
    d. Rise in inflammatory doubling of IL-6 or Ferritin, CRP in 24 hours
16. If any of the above occurs, shift to ICU
17. Few patients with COVID-19 experience a secondary bacterial infection. Consider empiric antibiotic therapy as per local antibiogram and guidelines in older people, immune-compromised patients, and children < 5 years of age.
18. Convalescent Plasma should be given in moderate disease if patients has persistent

hypoxia despite above measures. (Off label use)

Category C

1. Cautious trial of CPAP/NIV should be given as the therapeutic window in hypoxemic respiratory failure is very small. Facility for mechanical ventilation should be ready before attempting NIV
2. HFNC has shown to be of benefit in avoiding intubation in patients with very high oxygen requirements.
3. Use conservative fluid management in patients with Severe Covid when there is no evidence of shock.
4. Consider anti-inflammatory therapy with anti-IL-6 if Ferritin ot IL-6 doubles within 24 hours along with clinical and physiological signs of deterioration after ruling out clinically significant secondary bacterial or fungal infection
5. Corticosteroids
    a. Consider IV methylprednisolone 0.5 to 1 mg/kg OR Dexamethasone 0.1 to 0.2 mg/kg for 3 days (preferably within 48 hours of admission or if oxygen requirement is increasing and if inflammatory markers are increased). Review the duration of administration as per clinical response.
6. Anti-virals
    b. Inj. Remdesivir 200 mg on Day 1 followed by 100mg daily from Day 2 – 4 (under EUA)
7. Control of co-morbid condition
8. Therapeutic dose of UFH or LMWH (e.g., enoxaparin 40 mg per day SC) after excluding coagulopathy or thrombocytopenia or high risk of bleeding3
9. Inj. Thiamine 100 mg IV OD, Inj. Vit C 1.5gm IV 6 hourly
10. Mechanical ventilation if unable to maintain saturation, increased work of breathing or development of hemodynamic instability
    a. Conventional ARDS Net strategy
    b. Proning, recruitment manoeuvres
11. Convalescent Plasma (Under Trial Setting) or rescue therapy on compassionate grounds.

Management of hypoxemic respiratory failure and ARDS

Categorization of severity ARDS

- Mild ARDS: 200 mmHg < PaO2/FiO2 ≤ 300 mmHg (with PEEP or CPAP ≥5 cm H2O)
- Moderate ARDS: 100 mmHg < PaO2/FiO2 ≤200 mmHg with PEEP ≥5 cm H2O)
- Severe ARDS: PaO2/FiO2 ≤ 100 mmHg with PEEP ≥5 cm H2O)
- When PaO2 is not available, SpO2/FiO2 ≤315 suggests ARDS (including in non-ventilated patients)

Oxygenation targets — Vntilation strategy should be titrated to target a peripheral oxygen saturation (SpO2) of ≥ 94 percent during initial resuscitation and ≥9 0 percent for maintenance oxygenation. Hyperoxia should be avoided. Individualization of the goal is important such that some patients may warrant a lower target (eg, patients with a concomitant acute hypercapnic respiratory failure from chronic obstructive pulmonary disease [COPD]) and others may warrant a higher target (eg, pregnancy).

Low flow oxygen — For patients with COVID-19, supplemental oxygenation with a low flow system via nasal cannula or oxygen pendant (Annexure 1) is appropriate (ie, up to 6 L/min). Although the degree of micro-organism aerosolization at low flow rates is unknown, it is reasonable to surmise that it is minimal.

Higher flows of oxygen may be administered using a simple face mask, venturi face mask, or nonrebreather mask (eg, up to 10 to 20 L/minute) for patients with higher oxygen requirement. It is recommended that patients on nasal cannula to also wear a droplet mask, especially during transport or when staff are in the room.

Patients with higher oxygen requirements — As patients progress, higher amounts of oxygen are needed. Options at this point in non-COVID-19 patients are NRBM, Venturi mask, high-flow oxygen via nasal cannulae (HFNC) or the initiation of noninvasive ventilation (NIV). All these modalities have been used variably across the globe.

Noninvasive modalities or Invasive ventilation – Noninvasive modalities should be preferred as initial modality rather than proceeding directly to intubation. We believe that the decision to initiate noninvasive modalities, HFNC or NIV, should be made by balancing the risks and benefits to the patient, the risk of exposure to healthcare workers, and best use of resources. Clinical judgment should prevail always in these circumstances.

HFNC versus NIV – Among the noninvasive modalities, HFNC is preferred over NIV as an initial measure. The reasons cited in literature for this is better acceptability by the patient, patient comfort and prevention **Patient Self Inflicted Lung Injury** (PSILI) due to generation of very large tidal volumes with NIV. Overall, preference for HFNC is based upon limited and inconsistent data. NIV may be appropriate in patients with indications that have proven efficacy; these include patients with acute hypercapnic respiratory failure from an acute exacerbation of chronic obstructive pulmonary disease (AECOPD), patients with acute cardiogenic pulmonary edema, and patients with sleep disordered breathing (eg, obstructive sleep apnea or obesity hypoventilation). Overall, the data on the use of HFNC and NIV in patients with COVID-19 are limited. A systematic review (Rochwerg et al; Ann Intern Med 2020) identified one trial evaluating HFNC in patients with COVID-19, which suggested that it reduced the need for mechanical ventilation. Another systematic review (Schünemann et al; Ann Intern Med 2020) that included evidence from patients with SARS and MERS as well as COVID-19 reported that NIV might reduce the rate of intubation and mortality, based on low quality evidence. However, NIV may also increase the risk for transmission of SARS-CoV-2 to health care workers. Furthermore, the data on NIV are mixed, as some studies suggest a high failure rate of NIV in patients with MERS and other causes of ARDS.

Monitoring – Patients on HFNC or NIV need close monitoring for progression with frequent clinical and arterial blood gas evaluation to ensure effective ventilation prevention of complications. A low threshold to intubate such patients, particularly if they show any signs of rapid progression is recommended.

Precautions – HFNC and NIV are considered aerosol generating procedures. Thus, when HFNC or NIV is used, airborne in addition to standard precautions should be undertaken (ie, airborne infection isolation room [also known as a negative pressure room], full personal protective equipment).

HFNC – Placing a surgical or N95 mask on the patient during HFNC when healthcare workers are in the room decreases risk of transmission of infection to HCW. Additionally, using low flow rates to start with may also be beneficial however practicality of this has not been proved in clinical trials. Inhaled medications or gases (eg, epoprostenol, nitric oxide bronchodilators) should be avoided during HFNC.

NIV – Full face NIV masks are preferred to minimize particle dispersion. The mask should preferably have a good seal and should be non-vented. Use of a helmet has been

proposed for delivering NIV to patients with COVID-19. If NIV is used, **dual limb circuitry with a filter on the expiratory limb on a critical care ventilator may decrease dispersion** compared with single limb circuitry on portable devices, although data to support this are lacking. Starting with continuous positive airway pressure (CPAP) using the lowest effective pressures (eg, 5 to 10 cm H2O) is suggested.

Nebulized medications (spontaneously breathing patients) — Nebulization with bronchodilation may be required in patients with coexistent obstructive airway diseases but concerns have been raised about aerosolization and potentially increase the risk of transmission of COVID infection to HCWs. Generally, nebulized bronchodilator therapy should be reserved for patients with diagnosed OADs otherwise, nebulized therapy should be avoided. Metered dose inhalers (MDIs) with spacer devices are preferred over nebulizers for management of chronic conditions (eg, asthma or COPD controller therapy). Patients can use their own MDIs if the hospital does not have them on formulary.

Potential for transmission of SARS-CoV-2 should inform the use of other interventions in patients with documented or suspected COVID-19. It is prudent to minimize the following:

a. Positive airway devices for chronic nocturnal ventilation support
b. Chest physical therapy or oscillatory devices
c. Oral or airway suctioning
d. Sputum induction should be avoided
e. Bronchoscopy should be avoided in spontaneously breathing patients and limited to therapeutic indications (eg, life-threatening hemoptysis, central airway stenosis).
f. If any of these therapies are performed, similar PPE to that described for nebulizer therapy should be used.

Awake Self-Proning — Awake self proning is being increasingly advocated and is being recommended that patients should spend as much time as possible in prone position while on oxygen therapy or even on NIV. The rationale for this approach is based upon limited direct evidence and anecdotal observations in the field as well as indirect evidence of its efficacy in ventilated patients with acute respiratory distress syndrome (ARDS). Emerging evidence suggests that proning is feasible and results in improved oxygenation in some patients with COVID-19, regardless of whether they are receiving supplemental oxygen only, HFNC, or NIV. It remains unclear whether

pronation averts intubation, accelerates recovery, or reduces mortality.

When to Intubate

Timing – Appropriate time of intubation in patient with COVID-ARDS is controversial. Most patients with acute respiratory distress syndrome (ARDS) due to COVID-19 will warrant intubation and mechanical ventilation. **Delaying intubation until the patient acutely decompensates is potentially harmful to the patient and healthcare workers and is not advised**. For patients with escalating oxygen requirements, we monitor clinical and gas exchange parameters everyone to two hours and have a low threshold to intubate patients with the following:

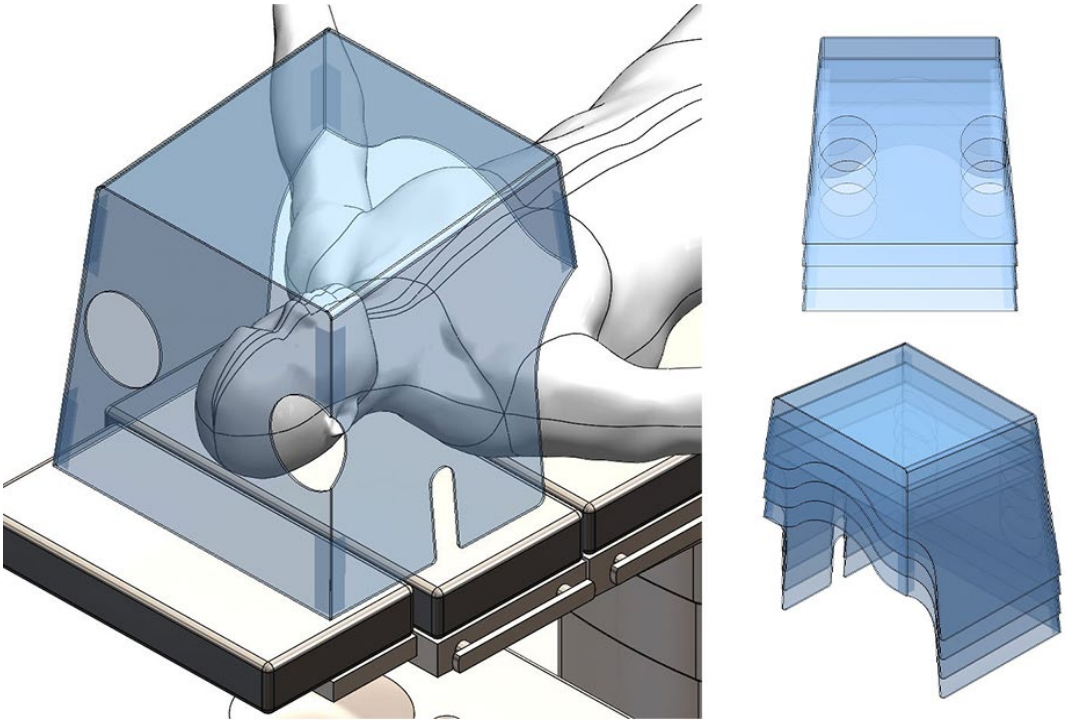
1. Rapid progression over hours
2. Lack of improvement on >50 L/minute of high flow oxygen and a fraction of inspired oxygen (FiO2) >0.6
3. Evolving hypercapnia, increasing work of breathing, increasing tidal volume, worsening mental status
4. Hemodynamic instability or multiorgan failure

Early intubation is often recommended but the definition of "early" is not clear. Use of noninvasive means are traditionally used to avoid intubation. However, their use is subject to controversy in patients with COVID-19. Clinicians should longitudinally assess the patients and monitor the oxygen requirement and perform an objective assessment of work of breathing make decision to intubate. The optimal timing of intubation and mechanical ventilation is largely based on clinical judgment and technical expertise in the field.

Precautions — Intubation is the highest risk procedure for droplet dispersion in patients with COVID-19. While quantification of the risk has been poorly documented, one prospective study of self-reported COVID-19 infection in healthcare workers reported a cumulative incidence of 3.6, 6.1, and 8.5 percent at 7, 14, and 21 days post a tracheal intubation procedure. Person intubating should be donning full PPE. Appropriate PPE includes a fit-tested disposable N95 respirator mask, with eye protection or a powered air-purifying respirator (PAPR), also known as an isolation suit. Intubation should be performed in an airborne infection isolation room, if possible, by the most qualified individual (eg, anesthesiologist) after proper preoxygenation since delayed and unsuccessful attempts of intubation may prolong dispersion and place the patient at risk of a respiratory arrest. Use of video laryngoscopy has been advocated by experts.

All preparations should be done before initiating the process of intubation such as preparing the ventilator circuit, selecting appropriate settings and mode of ventilator, Closed suction circuits should be utilized to minimize aersolization.. The expiratory limb on the ventilator should have a HEPA filter to decrease contamination of the ventilator and environment and protect staff when changing limb circuitry. To minimize exposure, bundling intubation with other procedures is appropriate as is bundling the chest radiograph for ETT and central venous catheter placement.

Use of transparent intubation box was associated with significant reduction in aerosol deposition to the individual performing intubation, their PPE clothing, and the surrounding environment as compared to doing it without box. Such devices are not yet commercially available.



Ventilator Management of Acute Respiratory Distress Syndrome

It is unclear that whether different phases of COVID-19 pneumonitis require different ventilatory strategies because Gattinoni and colleagues have highlighted the nonuniformity of patients with COVID-19-associated ARDS and proposed the existence of two primary phenotypes: type L (low values of elastance, pulmonary ventilation/

perfusion ratio, lung weight, and recruitability) and type H (high values of elastance, right-to-left shunt, lung weight, and recruitability), with the latter being more consistent

with what they describe as typical severe ARDS. However, this hypothesis, remains unproven and optimal ventilatory strategies based upon it are unclear. Until further data are available, a lung protective “open lung strategy” is preferred that promotes lung protection as outlined in the sections below.

Low tidal volume ventilation (LTVV) — As for all patients with ARDS, patients with COVID-19 pneumonia who develop ARDS requiring mechanical ventilation should receive LTVV targeting ≤6 mL/kg predicted body weight (PBW; range 4 to 8 mL/kg PBW (table 3 and table 4)). A volume-limited assist control mode should be used, beginning with a tidal volume of 6 mL/kg PBW, which targets a plateau pressure (Pplat) ≤30 cm H2O, and applies positive end-expiratory pressure (PEEP). This approach is based upon the standard ARDS Net strategy which have reported improved mortality from LTVV in patients with ARDS. It is thought that low tidal volumes (VT) mitigate alveolar overdistension induced by mechanical ventilation, which can cause additional lung injury and mortality in patients with ARDS. An institutional protocol that promotes LTVV to ventilated patients with ARDS is shown in the table below:

Initial ventilator settings								
Calculate predicted body weight (PBW)								
Male =	50 + 2.3 [height (inches) - 60] **OR**							
	50 + 0.91 [height (cm) - 152.4]							
Female =	45.5 + 2.3 [height (inches) - 60] **OR**							
	45.5 + 0.91 [height (cm) - 152.4]							
Set mode to volume assist-control								
Set initial tidal volume to 6 mL/kg PBW								
Set initial ventilator rate ≤35 breaths/min to match baseline minute ventilation								
Subsequent tidal volume adjustment								
Plateau pressure goal: Pplat ≤30 cm H_2O								
Check inspiratory plateau pressure with 0.5 second inspiratory pause at least every four hours and after each change in PEEP or tidal volume.								
If Pplat >30 cm H_2O, decrease tidal volume in 1 mL/kg PBW steps to 5 or if necessary to 4 mL/kg PBW.								
If Pplat <25 cm H_2O and tidal volume <6 mL/kg, increase tidal volume by 1 mL/kg PBW until Pplat >25 cm H_2O or tidal volume = 6 mL/kg.								
If breath stacking (autoPEEP) or severe dyspnea occurs, tidal volume may be increased to 7 or 8 mL/kg PBW if Pplat remains ≤30 cm H_2O.								
Arterial oxygenation and PEEP								
Oxygenation goal: PaO_2 55 to 80 mmHg or SpO_2 88 to 95 percent								
Use these FiO_2/PEEP combinations to achieve oxygenation goal:								
FiO_2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PEEP	5	5 to 8	8 to 10	10	10 to 14	14	14 to 18	18 to 24
PEEP should be applied starting with the minimum value for a given FiO_2.								

The use of a written protocol outlining how to provide LTVV is associated with enhanced compliance in patients with ARDS.

In patients with ARDS, we prefer the use of standard variables (VT and Pplat, lung compliance) rather than driving pressure to manage ventilator settings. However, the driving pressure may have some value in patients with severe or refractory ARDS to identify those with recruitable lung who may benefit from high levels of PEEP.

LTVV typically involve the following steps:

1. Choosing volume- or pressure-limited assist-control mode
2. Setting the initial VT and respiratory rate
3. Setting PEEP and fraction of inspired oxygen (FiO2)

Volume versus pressure-limited mode – While practice varies among clinicians, most experts adhere to a strategy of LTVV, using a volume-limited assist-control mode. However, a pressure-limited mode is an acceptable alternative if the resulting tidal volumes are stable and consistent with the strategy of LTVV. In most patients with ARDS, a volume-limited mode will produce a stable tidal volume while a pressure-limited mode will deliver a stable airway pressure, assuming that breath-to-breath lung mechanics and patient effort are stable. Regardless of whether volume-limited or pressure-limited mode of ventilation is chosen, fully supported modes of mechanical ventilation (eg, assist-control) are generally favored and partially supported modes **(eg, synchronized intermittent mandatory ventilation, should not be used**)

Tidal volume and respiratory rate – LTVV using a protocol like that used in the ARDS Network low tidal volume study trial as given in the picture above is recommended. The initial VT is set at 6 mL/kg PBW and the initial respiratory rate is set to meet the patient's minute ventilation requirements, provided it is ≤ 35 breaths per minute (most often between 14 and 22 breaths/minute). The PBW is calculated using the following equations (table 1 and table 2):

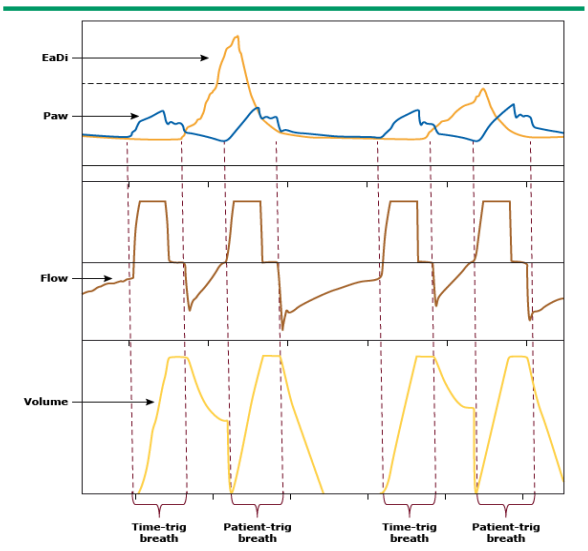
- For females: PBW (kg) = 45.5 + 0.91 * (height [cm] - 152.4)
- For males: PBW (kg) = 50 + 0.91 * (height [cm] - 152.4)

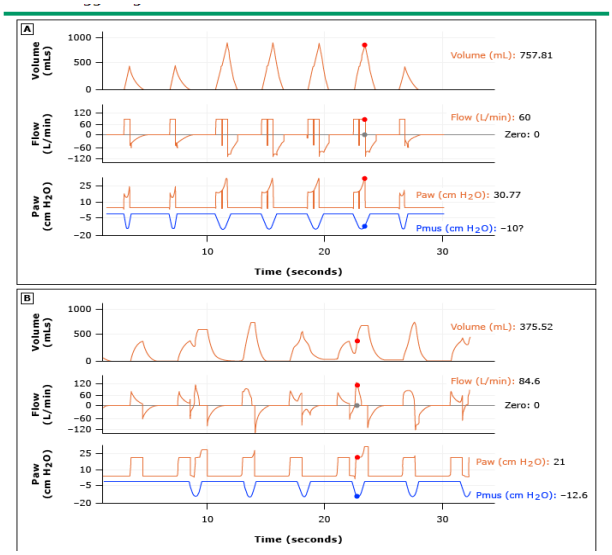
Over the next one to four hours, the patient’s clinical response, gas exchange, and Pplat can be used to adjust the VT and respiratory rate, if necessary. Clinicians are encouraged to make bedside adjustments to VT to ensure lung protective ventilation is being appropriately administered and to assess response in real-time before obtaining arterial blood gases. Typically, adjustments are made simultaneously to meet clinical

and gas exchange, as well as Pplat parameters.

- The goal Pplat is ≤30 cm H2O. The following is a general guideline for adjustment of the VT based upon Pplat:
- When the Pplat is ≤30 cm H2O and VT is 6 mL/kg PBW, no further adjustments are typically necessary.
- When the Pplat is >30 cm H2O and the VT is set at 6 mL/kg PBW or higher, the VT should be decreased in 1 mL/kg PBW increments to a minimum of 4 mL/kg PBW to reach the target plateau. Importantly, any decrease in VT may need to be accompanied by an increase in respiratory rate to maintain an acceptable minute ventilation.

If dyssynchrony is observed (typically, double triggering, the Pplat is <25 cm H2O, and the VT is <6 mL/kg PBW, the VT can be increased in 1 mL/kg PBW increments to Pplat >25 ≤30 cm H2O or VT reaches 6 mL/kg PBW (or 8 mL/kg PBW if dyssynchrony is severe).





The goal Pplat of ≤30 cm H2O is based upon the ARDS Network LTVV study, which showed benefit from this strategy. It is reasonable to keep the Pplat as low as possible, using LTVV even if the Pplat is already below 30 cm H2O. Adjustments to the VT and respiratory rate can also be made based upon gas exchange. There is no consensus regarding an acceptable lower or upper limit for pH or partial arterial pressure of carbon dioxide (PaCO2). However, most experts agree that while the ideal target is a pH 7.35 to 7.45, a pH below 7.25 and above 7.5 should be addressed while maintaining LTVV (ie, a VT between 4 and 8 mL/kg PBW and a pPlat ≤30 cm H2O).

Positive end-expiratory pressure (PEEP) and fraction of inspired oxygen – The goal of applied PEEP in patients with ARDS is to maximize and maintain alveolar recruitment and subsequently improving oxygenation. A set PEEP at 5 cm H2O and FiO2 at 1 at the onset of initiation of mechanical ventilation is recommended; the FiO2 is rapidly weaned over the next hour to target a peripheral saturation (SpO2) of 90 to 94 percent. Further adjustments of PEEP and FiO2 are then made using the strategy outlined in the ARDS Network LTVV study. A reasonable oxygenation goal during LTVV is a PaO2 between 55 and 80 mmHg (7.3 to 10.6 kPa) or an oxyhemoglobin saturation between 88 and 95 percent.

Efficacy and harm – Collectively, evidence suggests that the early application of and adherence to LTVV improves mortality, as well as other clinically important outcomes in patients with ARDS.

LTVV is generally well-tolerated but potential adverse effects include:

Permissive hypercapnia – Hypercapnic respiratory acidosis eg, pH <7.35 and PaCO2 >45 mmHg) is aby product of LTVV which is generally well tolerated and helps in maintaining a low alveolar pressure and minimize the complications of alveolar overdistension (eg, ventilator-associated lung injury). Permissive hypercapnia has got beneficial effects also such as better tissue oxygen delivery due to shift of oxygen dissociation curve to right and anti-inflammatory properties by triggering gene transcription against proinflammatory cytokines.

Auto-PEEP – Theoretically higher respiratory rates and decreases lung compliance together may create auto-PEEP by decreasing the time available for complete expiration. However, a subgroup analysis from the ARDS Network LTVV study detected negligible quantities of auto-PEEP in both the LTVV and conventional mechanical ventilation groups, indicating that auto-PEEP is rare during LTVV. However, if auto-PEEP is suspected, clinicians should estimate the contribution of auto-PEEP to the overall level of PEEP being delivered and manage it accordingly. Many ventilators are equipped with automatic tool for auto PEEP estimation and if not present an expiratory hold maneuver may be performed in completely paralyzed patient and auto PEEP can calculated as the difference between total PEEP and set PEEP (P_{Tot} - P_{Ext}) and managed accordingly by titrating PPE and respiratory rate.

Sedation – Logically speaking dyssynchrony should need higher sedation but a post-hoc analysis of data from a single center involved in the ARDS Network LTVV study,

there were no significant differences in the percentage of days patients received sedatives, opioids, or neuromuscular blockade when the LTVV group was compared with the conventional mechanical ventilation group

Failure of low tidal volume ventilation — For patients with COVID-19 that fail to achieve adequate oxygenation with LTVV, we agree with other experts in the field who have chosen prone ventilation as the preferred next step. For its application, we use similar criteria to those in non-COVD-19 patients (ie, partial arterial pressure of oxygen/fraction of inspired oxygen [PaO2:FiO2] ratio <150 mmHg, a FiO2 ≥0.6, and PEEP ≥5 cm H2O; excessively high airway pressures; or recalcitrant hypoxemia), although some experts use a higher PaO2:FiO2 ratio, given the good response seen in this population.

Prone ventilation — The efficacy of prone position ventilation in ARDS is well described in literature similar data for COVID related ARDS is lacking. But as of now it is recommended that patients with COVID-19-related ARDS should also be subjected prone ventilation for as long as is feasible without prematurely returning the patient to the supine position (ie, 12 to 16 hours prone per day) and to perform the maneuver at change of shift when sufficient staff are available.

The criteria for prong remain the same as for non COVID ARDS i.e. PaO2:FiO2 < 150 mmHg, FiO2 ≤0.6, PEEP > 10 cm H2O.

Additional measures — Additional options for patients in whom prone ventilation fails include the following:

- **Recruitment maneuvers** – Recruitment maneuvers and high PEEP may be attempted if the personnel have adequate experience for the same in patient having refractory hypoxemia.

- **Pulmonary vasodilators** – These agents may be used as rescue therapy in patients with refractory ARDS when other ventilatory stragies have failed. There is paucity of data to promote or refute the use og these agents in COVID related ARDS. These agents can improve ventilation-perfusion mismatch in patients with severe hypoxemia (eg, PaO2:FiO2 <100) and may be especially helpful in those with decompensated or acute pulmonary arterial hypertension [8].

  Inhaled nitric oxide gas (iNO) and aerosolized epoprostenol, are the two commonly employed agents in this regard.

Neuromuscular blockade – NMBA should be used in patients with refractory ARDS have ventilator asynchrony. The use should be cautious and prolonged use should be avoided because it is a risk factor for development of critical illness neuromyopathy which is an impediment to successful weaning.

Extracorporeal membrane oxygenation (ECMO) – In selected patients with refractory ARDS Veno-venous ECMO may be used as a rescue modality. The data regarding its efficacy in COVID-ARDS is evolving and it has been increasingly used as an adjunct support for patients presenting with acute viral pneumonia associated with COVID-ARDS. The initial reports indicate that it is assisting in restoring patients' blood oxygen saturation and reducing fatalities among the approximately 3% of severe cases where it has been utilized. For critically ill patients, the mortality rate reduces from around 59-71% with conventional therapy to approximately 46% with extracorporeal membrane oxygenation.

INDICATIONS	ABSOLUTE CONTRAINDICATIONS	RELATIVE CONTRAINDICATIONS
Murray score (PaO_2/FiO_2 ratio, PEEP, compliance, chest radiograph) ≥3 Refractory hypoxemia (PaO_2/FiO_2 ratio ≤100) despite lung-protective ventilation (tidal volume 4–6 mL/kg of predicted body weight, plateau pressure ≤30 cmH_2O, neuromuscular blockade, prone positioning considered, Inhaled pulmonary vasodilators Persistent respiratory acidosis (pH <7.20)	Uncontrolled metastatic cancer or terminal disease (life expectancy <6 months Acute intracerebral hemorrhage, infarction, or neurological dysfunction Contraindication to systemic anticoagulation	Immunocompromise Intubation >7 days (preferably <3 days), especially with high pressure/FiO_2 Severe multiorgan failure-increased lactate, increased INR, worsening LFT results, need for CRRT Age >65 years Limited vascular access RESP scores ≤–6 (*www. respscore. com*) or PRESERVE score >7

General precautions

1. Avoidance of unnecessary disconnection with the endotracheal tube (ETT) in ventilated patients with COVID-19 to avoid derecruitment and unnecessary exposure of virus to the environment.
2. Appropriate humidification apparatus to minimize chances of VAP.
3. Appropriate cuff pressures (between 25 and 30 cm H2O)
4. All ventilators should have appropriate filters in place and agreed upon filter change schedule (eg, every six hours). The ventilator should be wiped down after every filter change.

Weaning – Standard weaning criteria should be used for extubation of patients recovering from COVID-ARDS:

1. Patient should be afebrile, fully conscious orients and hemodynamically stable

without any vasopressor support.

2. He should fulfil following criteria:
    a. RR< 30/min
    b. HR< 90/min
    c. **Rapid Shallow Breathing Index (RR/Tidal volume in liters)** > 100
3. There should minimal mucoid ET secretions. Any evidence of incubating or active lung infection should take as contraindication for weaning.
4. Patient should be able to maintain saturation above 94% on FIO2 of < 0.4 with a PEEP support of > 6.

Extubation – Extubation should ideally be performed in an airborne isolation room. Respiratory therapists and others in the room during extubation should adhere to stricy IPC and airborne precautions.

Extubation failures should be anticipated and facility for back up noninvasive ventilation or HFNC should be available. Both low-flow and high-flow oxygen systems should be set up and readily available.

Post-extubation care – A extubation failure rate of 6 – 11% is acceptable in a standard ICU. Facilties for NIV support to avoid reintaubation should be readily available and threshold to reintubate should be low.

Management of septic shock

1. 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] <5th centile or >2 SD below normal for age) or two of the three 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.
2. 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.

3. 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.
4. 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.
5. 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 raising test, 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.
6. 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.
7. 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
8. local tissue necrosis. If extravasation occurs, stop infusion. Vasopressors can also be administered through intraosseous needles.
9. If signs of poor perfusion and cardiac dysfunction persist despite achieving MAP target with fluids and vasopressors, consider an inotrope such as dobutamine.

Annexure 1

Protocol for "awake proning" in patients with or suspected of having COVID-19

Proning intubated patients is a standard of care in the management of patients with ARDS in intensive care. Its mechanism in improving oxygenation is by recruitment of dorsal lung units and improving V/Q matching. This is similar in non-intubated patients (1) and may be beneficial in the management of hypoxaemia associated with COVID-19. However, prone poisoning should not delay the referral to critical care if appropriate.

Criteria for proning:

1. Co-operative patient who is able to communicate clearly
2. The patient is able to change position themselves
3. Requiring approximately >40% oxygen and/or saturations <93%
4. Patients are haemodynamically stable with systolic blood pressure >90mmHg

Aim: To improve oxygen saturations in patients with or suspected of having COVID-19

Timed Position Changes:

If patient fulfils criteria for proning ask the patient to switch positions as follows. Monitor oxygen saturations 15 minutes after each position change to ensure oxygen saturation has not decreased

1. 30 minutes to 2 hours lying fully prone (bed flat)
2. 30 minutes to 2 hours lying on right side (bed flat)
3. 30 minutes to 2 hours sitting up (30-60 degrees) by adjusting head of the bed
4. 30 minutes to 2 hours lying on left side (bed flat)
5. 30 minutes to 2 hours lying prone again
6. Continue to repeat the cycle…….

The variable duration of prone positioning is to make the procedure as well tolerated as possible. Sedation to allow proning should be avoided.

. If oxygen saturation decreases:

1. Check oxygen is connected to patient
2. Ask the patient to change to one of the other positions
3. Increase inspired oxygen if feasible
4. Refer to escalation plan if oxygen saturation not improving.

Discontinue prone positioning if

1. No improvement in oxygen saturations with change of position – ensure decision regarding escalation of care made.
2. Consistent reduction in oxygen requirements to 28% or 4l/min oxygen via NC

Annexure 2

Dosing & Preparation of Vasoactive Drugs

Drug	**Ampoule / vial**	**STEP 1 Calculation of drug dose for preparation**	**STEP 2 How to prepare**	**STEP 3 Infusion rate**	**STEP 4 Actual drug dose patient receiving**
Noradrenaline/ Adrenaline	1 amp. contains 2 mg	Body weight × 0.03 =.....mg	To be dissolved in Distilled water or 5% dextrose in a 50 ml syringe	1 ml/ hour equals to 3 ml/hour equals to 10 ml/hour equals to	0.01 mcg/kg/min 0.03 mcg/kg/min 0.1 mcg/kg/min
Dobutamine	1 vial contains 250 mg	Body weight × 3 =.....mg	To be dissolved in Distilled water in a 50 ml syringe	3 ml / hr equals to 5 ml / hr equals to	3 mcg/kg / min 5 mcg/kg / min
Vasopressin	1 amp. Contains 20 U		To be dissolved in Distilled water in a 20 ml syringe	1.2ml/hour equals to 2.4ml/hour equals to 3.6ml/hour equals to	0.02 units/min 0.04 units/min 0.06 units/min
Hydrocortisone (Septic shock)	1 vial contains 100 mg		To be dissolved in distilled water in a 50 ml syringe		200 mg (2 vials) infusion over 24 hours

Prevention of Complications

Anticipated Outcome	Interventions
Reduce days of invasive mechanical ventilation	• **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	• **Oral intubation is preferable to nasal intubation in adolescents and adults** • **Keep patient in semi-recumbent position (head of bed elevation 30- 45º)** • **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	• **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	• **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	• **Turn patient every two hours**
Reduce Incidence of stress ulcers and gastrointestinal bleeding	• **Give early enteral nutrition (within24-48 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 ≥ 48 hours, coagulopathy, renal replacement therapy, liver disease, multiple co-morbidities, and higher organ failure score**
Reduce incidence of ICU-related weakness	• **Actively mobilize the patient early in the course of illness when safe to do so**

Pharmacological Therapy – Dosage and Precautions

Hydroxychloroquine (HCQ)

Dose: Tab HCQ 400mg BD for 1 DAY followed by 200 mg BD x 4 Days

Contraindication for HCQ

a. QT Interval > 480ms
b. Pre-existing cardiomyopathy and cardiac rhythm disorders
c. History of Unexplained Syncope
d. Retinopathy,
e. Hypersensitivity to HCQ or 4-aminoquinoline compounds
f. G6PD deficiency
g. Epilepsy
h. Hypokalemia (K+ < 3 Meq)

Anticoagulant Agents

Pro Coagulant factors are increased in COVID-19 infection and associated with increased risk of thrombosis. Pneumonia and sepsis are complicated by DIC, but although COVID-19 patients do have abnormalities of coagulation and are not atypical of DIC. The most marked abnormality is an elevation of D-Dimer (if D-dimer is more than 1000ng/ml) but without a parallel fall in platelet or prolongation of clotting time, this suggests that local rather disseminated thrombin generation and fibrinolysis is taking place.

- Inj ENOXAPARIN 40MG S/C Once daily for mild and moderate. Twice daily in severe cases **OR**
- Inj Fondaparinux 2.5mg OD SC **OR**
- Unfractioned Heparin 5000 Units BD SC

Risk of Bleeding:

Use validated score for assessing bleeding risk (e.g. HAS-BLED Score), Use D-Dimer and SIC for further risk stratification (SIC score ≥ 24 portends high thrombotic risk).

Contraindications:

ESRD, active bleeding, emergency surgery, platelets < 20,000/mm3, BP >200/120 mmHg)

Remdesevir

Remdesivir (under Emergency Use Authorization) may be considered in patients with moderate disease (those on oxygen) with none of the following contraindications:

- AST/ALT > 5 times Upper limit of normal (ULN)
- Severe renal impairment (i.e., eGFR < 30ml/min/m2 or need for haemodialysis)
- Pregnancy or lactating females
- Children (< 12 years of age)
- Can be given in cases of ESRD on maintenance haemodialysis under nephrologist consultation

Dose: 200 mg IV on day 1 followed by 100 mg IV daily for 4 days (total 5 days)

No dose adjustment for Inj REMDESIVIR if eGFR >30ml/min

Convalescent plasma (Off Label) may be considered in patients with moderate disease who are not improving (oxygen requirement is progressively increasing) despite use of steroids. Special prerequisites while considering convalescent plasma include:

a. ABO compatibility and cross matching of the donor plasma
b. Neutralizing titer of donor plasma should be above the specific threshold (if the latter is not available, plasma IgG titer (against S-protein RBD) above 1:640 should be used)
c. Recipient should be closely monitored for several hours post transfusion for any transfusion related adverse events
d. Use should be avoided in patients with IgA deficiency or immunoglobulin allergy
e. Dose: Dose is variable ranging from 4 to 13 ml/kg (usually 200 ml single dose given slowly over not less than 2 hours

Tocilizumab (Off Label) may be considered in patients with severe disease with progressively increasing oxygen requirements and in mechanically ventilated patients not improving despite use of steroids. Long term safety data in COVID 19 remains largely unknown. Special considerations before its use include:

a. IL-6 levels 50-100-fold higher than normal (Normal range 0 - 9.5pg/ml
b. Worsening trend of the inflammatory markers (Ferritin, LDH, CRP) (doubling within 24 hours)

c. Deteriorating clinical condition with worsening of PaO2/Fio2 ratio (more than 25% deterioration from the immediate previous value)

The drug is contraindicated in:

PLHIV, those with active infections (systemic bacterial/fungal), High Serum Procalcitonin, Tuberculosis, active hepatitis, Absolute Neutrophil Count < 2000/mm3 and Platelet count < 1,00,000/mm3, hepatic and renal impairment; patients on chronic steroid therapy, Paediatric patients <18 years old; Pregnancy and, Nursing mothers

Dose: 8mg/kg (maximum 800 mg at one time) given slowly in 100 ml NS over 1 hour; dose can be repeated once after 12 to 24 hours if needed

Drugs Recently approved by DGCI

1. **ITOLIZUMAB** (An anti-CD6 IgG1 monoclonal antibody)

a. Indication:
    1. IL-6 levels 50-100 fold higher than normal (Normal range 0 - 9.5pg/ml
    2. Worsening trend of the inflammatory markers (Ferritin, LDH, CRP)
    3. Deteriorating clinical condition with worsening of PaO2/Fio2 ratio (more than 25%

b. Deterioration from the immediate previous value).
c. Dose: 1st dose – 1.6mg/kg dose iv infusion
d. Subsequent dose: weekly 0.8mg/kg dose infusion over 4hours if required based on lung function parameters

Contraindication:

PLHIV, those with active infections (systemic bacterial/fungal), High Serum. Procalcitonin, Tuberculosis, active hepatitis, Absolute Neutrophil Count < 2000/mm3 and Platelet count < 1,00,000/mm3, hepatic and renal impairment; patients on chronic steroid therapy, Paediatric patients <18 years old; Pregnancy and, Nursing mothers

Side effects:

a. In trial infusion reactions have been reported in 15% of the patients
b. In clinical practice also infusion reaction ranged from 12% to 15%
c. Other adverse events include Diahorea, Pruritus in 7 – 12 % of cases

Favipiravir

Mechanism of action: It is considered that favipiravir is metabolized in cells to a ribosyl triphosphate form (favipiravir RTP) and that favipiravir RTP selectively inhibits RNA polymerase involved in influenza viral replication

Indications: mild to moderate cases of COVID19 in adults >18yrs old

Dose: 1800mg bid followed by 800mg bid up to maximum of 14days

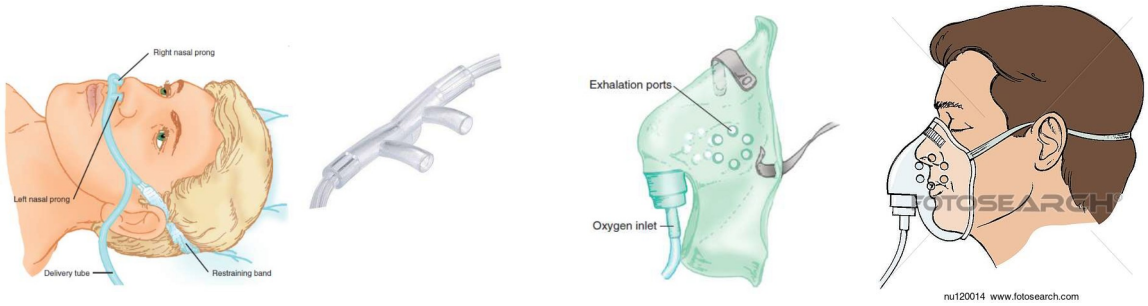
Contraindications: Hyperuricaemia, severe hepatic & renal impairment, Pregnant women and lactating mothers

Side Effects: Increased Uric Acid levels, diarrhoea, decreased neutrophil counts, increase in AST/ALT levels

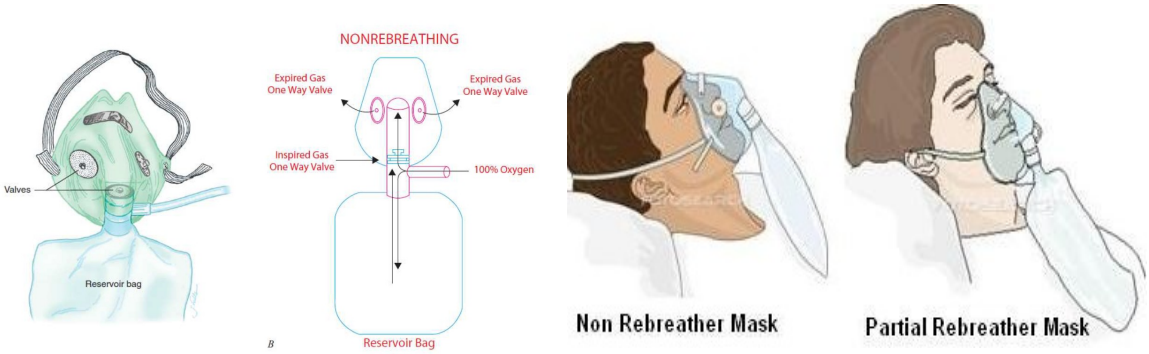
Drug Interactions: Metabolised partly by Aldehyde Oxidase (AO) and partly by Xanthine Oxidase (XO). Precautions for co-administration with Pyrazinamide, Repaglinide, Theophyline, Famciclovir

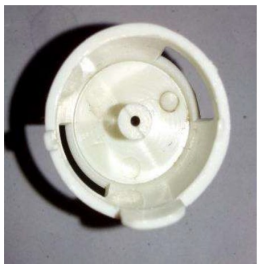
Oxygen delivery protocol

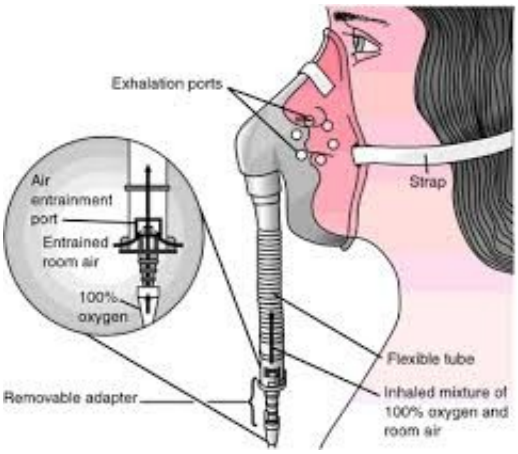
- Oxygen supplementation may be done done through simple face mask or nasal prongs @ 3 - 6 liter/min if SpO2 < 94%



- Continuous close monitoring should be done with finger pulse oximetry or multiparametric monitors if available.
- If patient is unable to maintain SpO2 > 94% on simple face mask or nasal prongs, Venturi Masks OR Non rebreathing reservoir bag masks should be used @ a flow of 10-15L/min





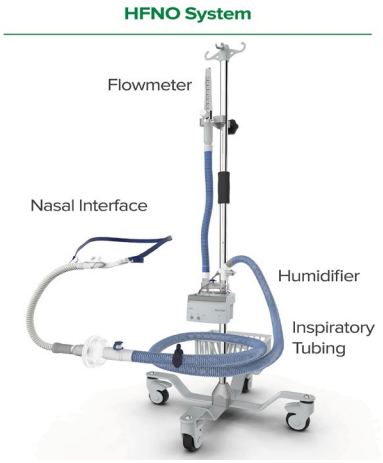


- Oxygen delivered with various oxygen delivery devices (approximate FiO2%) is shown in table below:

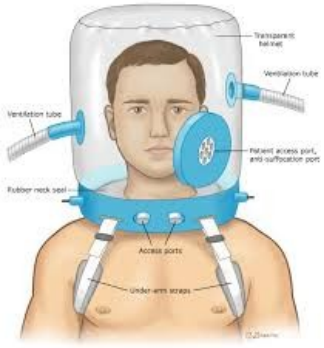
FLOW RATE (L/min)	FiO2 delivered
Nasal cannula (1-6)	0.24 – 0.44
Trans tracheal catheter (0.5-4)	0.24 – 0.4
Oxygen mask (5 – 8)	0.4 – 0.6
Mask with reservoir bag (6-10)	0.6 – 0.9
Non rebreathing (4-10)	0.6 – 1.0
Venturi mask (high flow) 3-15	0.24 – 0.6

HFNO (High Frequency Nasal Oxygen) and NIV (Non-invasive Ventilation)

- When oxygen requirement increases to needing NRB, options of High Frequency Nasal Oxygen (HFNO) or NIV should be considered.
- HFNC flow rates to be set from 30 -60 L/min titrating to maintain SpO2 ≥ 92%
- HFNC provides PEEP up to 5-6 cm H20 and can deliver FiO2 up to 100%



- If HFNC non-available or patient not maintaining SpO2 on flow rates up to 60L/min, initiate on non-invasive ventilation (NIV) only with an ICU ventilator with two limbed circuit and expiratory HME filter with a NIV mode available. Caution is to be exercised to not use potable home BiPAP or CPAP machines with single circuit for these patients.



Initial Settings	

• Spontaneous trigger mode with back up rate
• Start with low pressures
• IPAP – 8 to 12 cm of H2O
• EPAP – 3 to 5 cm of H2O
• Adjust inspired FiO2 to keep Sat > 94%
• Increase IPAP gradually to
  • Decrease respiratory rate
  • Increase tidal volume
	• Success and failure criteria for NIIPV
	  • Improvement in pH and PCO2 within 2 hours of initiation
	• Indication for discontinuation of NIV
	  • Worsening sensorium
	  • Extreme anxiety and distress
	  • Hemodynamic instability
	  • Worsening oxygenation

- Appropriate mask with good seal to be ensured when initiated on NIV. Helmet masks/hoods if available, to be preferred to minimize aerosol contamination.
- Once initiated on NIV, close monitoring of respiratory variables hourly is important.
- Reassess clinical condition hourly, monitor and observe ABG's 4-6hrly
- Look for signs of clinical improvement in the form of settling tachycardia, improving SpO2, reduced tachypnea and reduced work of breathing.
- On NIV when there are signs of clinical deterioration in the form of worsening sensorium, increased accessory muscles of breathing, raising Pco2, worsening pH on ABG ~ failure of NIV has to be considered and patient has to be planned for intubation and mechanical ventilation after consent from the family.

Intubation and Mechanical Ventilation

Timing of intubation

- There is lack of high-quality evidence to provide guidance on optimal timing of intubation in ARDS due to COVID-19.
- Intubation might be beneficial in patients with high respiratory drive and at high risk of patient self-inflicted lung injury (PSILI)
- Non-invasive ventilation has been associated with worse outcomes when PaO2/FiO2 ratio <150 in ARDS
- Consider timely intubation as indicated by refractory hypoxaemia or hypercapnia, and by objective evidence of high work of breathing on clinical examination

Indication for intubation:

- ARDS with PaO2/FiO2 < 200 (clinical judgement prevails)
- Worsening respiratory distress even on NIV
- Patient in Shock

Initial Settings:

Volume Control or Pressure control mode to me preferable used

Calculate predicted body weight (PBW)

- **Males = 50 + 2.3 [height (inches) - 60]**
- **Females = 45.5 + 2.3 [height (inches) -60]**

Tidal volume

- Low tidal volume ventilation (4-6ml/kg PBW) has been associated with improved outcomes in patients with and without ARDS and should be used in COVID related ARDS also.
- Tidal volume may be liberalized (up to 8 mL/kg PBW) in patients who are double triggering, or if inspiratory airway pressure decreases below PEEP, keeping plateau pressure <30 cm H2O36
- Ideally, **driving pressure should be** (Pplat - PEEP) ≤14 cm H2O

PEEP

- Higher PEEP might be beneficial in patients H Phenotype i.e. tose with with high recruitability, with better gas exchange and reduced risk of ventilator-induced lung injury
- Higher PEEP can be harmful in patients with L Phenotype i.e. those with low recruitability, who have hypoxaemia due largely to pulmonary vascular pathology; high PEEP can lead to adverse haemodynamic effects or barotrauma

- Individualise PEEP; consider higher PEEP in patients with evidence of higher potential for recruitment

Suggested Combinations of PEEP and FIO_2 for ARDS/ALI GOAL PaO_2																	
FI02	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0
PEEP (cm H_20)	5-14	5-14	8-16	8-16	10-20	10-20	10-20	12-20	14-20	14-22	14-22	14-22	16-22	18-22	20-22	22	24

Goals of mechanical ventilation in ARDS/ALI
PaO_2: 55-80 mm Hg
Plateau Pressure: < 30 cm H_20
Tidal volume: 6ml/kg predicted body weight
pH: > 7.15

Titrating the Ventilator in ARDS/ALI
Start with AC with Tidal Volume of 8 mL/kg of predicted body weight and decrease by 1ml/kg over four hours until tidal volume is 6mL/kg goal is reached
If plateau pressure is >30 cm H_20, decrease tidal volume by 1mL/kg until tidal volume is 4mL/kg or arterial pH reaches 7.15
Initiate PEEP at 5 cm H_20 and titrate up in increments of 2cm H_20 according to table above
Optimal PEEP setting are between 8-15 cm H_20

Prone positioning

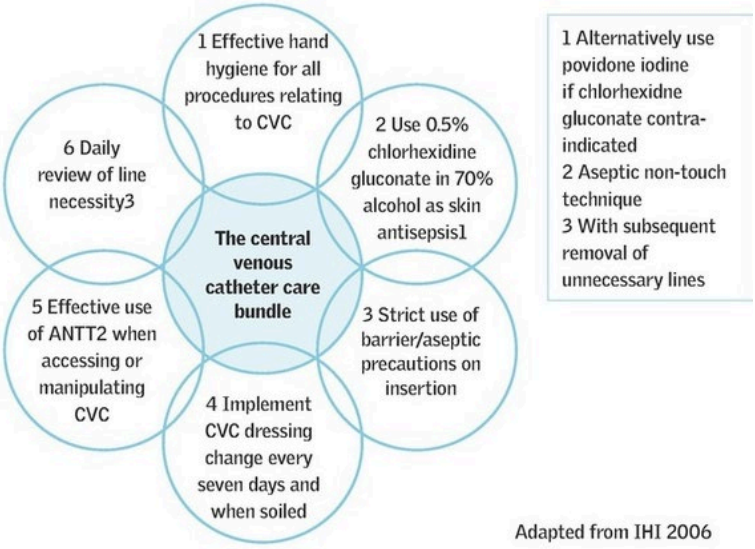
- Efficacy and safety of prone positioning in awake, non-intubated patients remain unclear and are being evaluated in clinical trials in patients with COVID-19 (NCT04350723, NCT04347941, NCT04365959)
- In the absence of contraindications, use prone positioning in mechanically ventilated patients with PaO2/FiO2 ratio <150 on FiO2 > 70%, PEEP > 8 and TV 6ml/kg.
- Early proning i.e. mechanical ventilation duration < 36 hours is associated with better results
- Patient should be proned for 12 – 16 hours
- Multiple sessions are required till desirable results are achieved.

Venovenous ECMO

- Patients can develop refractory hypoxaemia or have mechanics leading to potentially injurious levels of mechanical ventilation, despite optimisation of conventional measures
- Venovenous ECMO may be considered in patients with refractory hypoxaemia or high driving pressures or respiratory acidosis despite conventional lung-protective measures (eg, higher PEEP or prone positioning)

Adjunctive care in patients on ventilator

Prevention of VAP



Prevention of CRBSI

The CAUTI Bundle:

- **Hand Washing**
- **Avoid unnecessary urinary Catheters**
- **Insert urinary catheters using aseptic technique**
- **Maintain urinary catheters based on recommended guidelines**
- **Review urinary catheter necessity daily**

Prevention of UTI

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Standard Operating Procedure for Management of Patients Presenting with Acute Respiratory Illness at RCH

This guideline provides recommendations for infection prevention and control in managing patients with suspected or confirmed COVID-19 in the institute. These guidelines aim to prevent transmission of COVID-19 infection in the institute. through the implementation of appropriate infection prevention and control measures.

1. All patients presenting to the institute with acute respiratory illness will be primarily admitted and evaluated at the emergency department (T3) of Rajdhani COVID-19 Hospital.
2. COVID-19 should be suspected as a possible etiology in all patients presenting to the institute with acute respiratory illness.
3. Screening and Triage:
    a. All patients with suspected COVID-19 should be screened at the first point of contact i.e. the emergency department of Rajdhani COVID-19 Hospital.
    b. COVID-19 should be considered as a possible etiology in all patients presenting to the institute with SARI. Triaging of patients should be done using standardized triage tools and standard first-line treatments should be initiated.
4. Standard IPC measures should be implemented at the all times in the management of SARI.
5. All patients' beds should be placed at least 1 metre apart regardless of whether they are suspected to have COVID-19.
6. All health care personnel should be donning full PPE during management of these patients
7. Immediate sample collection should be done and sent for COVID 19 testing by True Nat and RT-PCR.
8. If RT-PCR is positive the patient should be transferred to ICU or Isolation ward of COVID-19 hospital as applicable.

9. Empirical therapy with Broad spectrum antibiotics according underlying comorbidity.
    a. If no comorbidity – Third generation cephalosporin with Doxycycline
    b. Underlying DM or immune suppressing condition – Carbapenam plus Tiecoplanin plus doxy/azithromycin should be started
    c. If very high index of suspicion of COVID – HCQ plus Azithromycin may be added empirically.
10. All patients with suggestive history and ILI and hypoxemic respiratory failure should undergo an HRCT thorax and CORADS scoring should be done. In CORAD = 4 and above: empirical Remdesevir 200 mg IV on Day 1 then 100 mg IV OD x 4days, prophylactive dose anticoagulation with LMWH (Enoxaparin/Dalteparin) and Dexamethasone 0.1 - 0.2 mg/kg OD may be started.
11. Contact and Droplet precautions
12. Strict hand hygiene
13. Maintain adequate hydration
14. Oxygen Support:
15. Target SpO2: 92-96% (88-92% in patients with COPD)
16. Oxygen supplementation should be started with nasal prongs. If unable to maintain saturation with up to 6litre/min high flow oxygen delivery systems should used such as:
    a. Venturi Mask
    b. Non re-breathing reservoir bag masks
    c. High Flow nasal cannula
    d. If HFNC or simple nasal cannula is used, N95 mask should be applied over it.
17. Cautious trial of CPAP/NIV should be given as the therapeutic window in hypoxemic respiratory failure is very small. Facility for mechanical ventilation should be ready before attempting NIV
18. HFNC has shown to be of benefit in avoiding intubation in patients with very oxygen requirements.
19. Use conservative fluid management in patients with Severe Covid when there is no evidence of shock.
20. Mechanical ventilation if unable to maintain saturation, increased work of breathing or development of hemodynamic instability (for details refer to chapter 1)
    a. Conventional ARDS Net strategy should be implemented.
    b. Proning, recruitment manoeuvres as rescue for refractory hypoxia

22. In case of high index of suspicion two sets of COVID testing (One TrueNat and One RT PCR) should be obtained before labelling an individual as COVID-19 negative. His hospital documents will be transferred online, and no documents will be taken out of T3 including hospital file, treatment flow charts etc
23. Patient should be transferred out to the destination depart ent according to the Transfer- ut SOP.

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COVID-19 Testing Protocol SPGIMS, Lucknow

Recommendations of committee on COVID-19 testing guidelines at SGPGIMS, Lucknow (*These are only interim guidelines and may be revised as and when ICMR and or COVID-19 testing guideline committee-SGPGI modifies it in light of emerging evidence and or logistics)*

Free COVID-19 testing

As per Indian Council of Medical research (ICMR), New Delhi guidelines COVID-19 free testing should be performed for following group of patients.

1. All symptomatic Influenza like illness (ILI) individuals with history of international travel in the last 14 days.
2. All symptomatic contacts of laboratory confirmed cases.
3. All symptomatic health care workers / frontline workers involved in containment and mitigation of COVID19.
4. All patients of Severe Acute Respiratory Infection (SARI).
5. All symptomatic ILI within hotspots/containment zones.
6. All hospitalized patients who develop ILI symptoms.
7. All symptomatic ILI among returnees and migrants within 7 days of illness.

Retesting of SARS CoV-2 (COVID-19) positive patients

This is as per the revised discharge policy of COVID-19 patients, Ministry of Health and Family Welfare, Govt. of India (www.mohfw.gov.in).

1. **Very mild/ mild / Pre-symptomatic cases**: As per guidelines the patient may be discharged after 10 days of symptom onset and no fever for 3 days and there is no **need for testing prior to discharge.** However the committee recommends that the patient be discharged only after PCR negative report once.
2. **Moderate severity cases**:

a. Patients whose symptoms resolve within 3 days and maintain saturation above 95% for next 4 days: As per guidelines if the fever resolves within 3 days and patient maintains saturation above 95% for the next 4 days (without oxygen support) such patient may be discharged after 10 days of symptom onset in case of:

- Absence of fever without antipyretics
- Resolution of breathlessness
- No oxygen requirement
- There is no **need for testing prior to discharge.** However the committee recommends that these patients be discharged only after PCR negative report once on day 12(As per UP Govt Order No: 1094/5-5-2020, DATED 14/5/2020).

b. Patient on oxygenation whose fever does not resolve within 3 days and demand of oxygen therapy continues:

1. Such patient may be discharged

- Only after resolution of clinical symptoms
- Ability to maintain oxygen saturation for 3 consecutive days. There is no **need for testing prior to discharge.** However the committee recommends that the patient be discharged only after PCR negative report once done on day 12(As per UP Govt Order No: 1094/5-5-2020, dated 14/5/2020)..

3. **Severe cases including Immunocompromised** (HIV patients, Transplant patients, Malignancy):

a. May be discharged based on clinical recovery and the **patient should be tested negative once by RT PCR before discharge.**

Free COVID-19 testing for Health care workers
(Including contractual health care workers working in SGPGI)

1. **HCW posted on COVID-19 duty and under active quarantine**: In accordance with Uttar Pradesh government order no 2362/71-1-2020 dated 28.05.20 after 14 days of COVID-19 duty; a sample will be collected once on day 15 for COVID-19 testing. For all symptomatic HCWs, they need to visit the triage of Rajdhani COVID Hospital (RCH) for free sampling.

2. **For HCW posted on non-COVID-19 duty:** In case the HCW is symptomatic with flu

like illness, he/she will visit the screening Area-1 and Area-2 of SGPGI and if needed will be tested free at PMSSY-SBI-ATM counter designated for HCWs.

3. Asymptomatic direct and high-risk contacts of a confirmed case to be tested twice. **First RTPCR will be done immediately following exposure and second test will be done on day 14 of exposure.**

Paid COVID-19 testing

In view of limited testing capacity of COVID-19 laboratory, Department of Microbiology, SGPGIMS it has been decided by committee to provide paid COVID-19 testing to following group of patients.

1. Patients admitted in SGPGIMS, Lucknow and undergoing major/ minor surgery, radiological/ cardiology/ surgical intervention procedure.
2. Patients presenting at Holding Area, SGPGIMS, Lucknow.
3. Patients receiving chemotherapy/Radiotherapy in SGPGIMS, Lucknow.
4. Patients undergoing surgical procedures at general hospital, SGPGIMS, Lucknow.
5. Before patient admission in ward/ICU of SGPGIMS the patient will be instructed to come to institute with COVID-19 test report from their native place/ outside.
6. Patients selected to attend physical OPD/ OPD based procedure/ Endoscopy/ Manometry/other aerosol generating procedure/ Inpatient admission at SGPGIMS, Lucknow must visit SGPGIMS along with only one attendant with COVID-19 negative report (Both patient and attendant) not more than 14 day old.
7. The committee recommends in that patient admitted to wards and ICU of SGPGIMS, Lucknow with COVID-19 negative reports, repeat COVID-19 testing is strongly discouraged and is indicated only if some aerosol generating procedure such as surgery under general anesthesia. The test remains valid till the patient remained admitted in the hospital and is asymptomatic.

For paid testing the patient should be registered at SGPGIMS and his form should be raised in Hospital information system. Further with current testing capacity it is not possible to test for more than one patient attendant at Department of Microbiology, SGPGIMS, Lucknow.

Note:

1. The gold standard test for COVID-19 is RT-PCR. The standard reporting time for this test is 12 to 24 hours. However, due to overwhelming workload, reporting times may be longer in some cases.

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STANDARD OPERATING PROTOCOL FOR HOLDING AREA

Implementation of Protocol for NON-COVID Area has been discussed in accordance with office order no. PGI/CMS/Estt./1306/2020 dated 30-04-2020.The following points discussed and decided.

1. A rapid response team is constituted who will co-ordinate the day to day functioning of emergency micro plan of Holding Area under chairmanship of Prof. Amit Agarwal, CMS. The committee is as under:-

I.	Prof. Puneet Goyal, Dept. of Anesthesiology	Nodal Officer
II.	Dr Alok Nath, Dept of Pulmonary Medicine	Co-Nodal Officer
III.	Prof Punita Lal, Head Radiotherapy	Member
IV.	Prof. Sudeep Kumar, Dept. of Cardiology	Member
V.	Dr. Amit Goel, Dept of Gastroenterology	Member
VI.	Dr. Dharmendra Bhadauria, Dept. of Nephrology	Member
VII.	Dr. Sanjoy Sureka, Dept. of Urology	Member
VIII.	Dr. Tapas Kumar Singh, Dept. of Anesthesiology	Member

2. **Objective of Holding Area (Non-Covid):** To hold patients requiring admission in SGPGI (Main hospital building and PMSSY block), till their Covid test report becomes available. They would be shifted to respective specialty ward or to ERS, as soon as covid report comes negative. If unfortunately, Covid test report comes positive then the patient would be shifted to RCH by back door of Old OPD block.
3. **Holding Area Zone 1** will be activated from Friday i.e. 8th May 2020 with 18 beds. Palliative Care ward in Old OPD Block would be used for this purpose and 18 bedded facility would be activated, initially. In principle zone 1 will be responsible **only for management of stable patients** (who would require minimal or no intervention for first 24 hrs / till covid report becomes available). Later on, when patient load exceeds the capacity of zone 1, Holding Area Zone 2 may be activated in adjacent ward of Old OPD Block to make a total capacity of 40 beds, depending upon the availability of manpower to run this.

   Only those patients who are stable and really require to stay in hospital till their COVID report becomes available would be admitted, OR those patients who are requested by Medical and Surgical Specialty for admission would be admitted in

holding area. It would be the responsibility of concerned unit to transfer them, as soon as COVID report becomes available.

4. Following types of patients would be admitted;
    a. Cancer patients requiring urgent care
    b. Neonates
    c. Pregnant Mothers for delivery / Emergency care
    d. Patients requested by Medical / Surgical Specialties
5. No patient with fever, Flu like illness, respiratory difficulty/distress would be admitted in holding area, they would be Red tagged and would be shifted to Rajdhani COVID hospital from screening area itself.
6. Chemotherapy / Radiotherapy patients with Covid Negative status, if become unstable, would be shifted to ERS.
7. Special precaution will be taken to screen patients coming from localities tagged as Red Zone / Containment Zone by State govt / Local administration. **Ms Kusum Yadav, PRO to make available the updated list of Hot spots / Red Zones at Screening area 1 and 2.**
8. One duty doctor, one Data Entry Operator and one PRO will be available round the clock for screening patients at Screening-2. DEO will register the patient and will generate CR No. then raise the form for Covid test. Same procedure will be followed for relative / attendant of the patient. Relative and Patient would pay the regular charges of hospital registration but their covid testing form will be generated on payment of Rs 1/-.
9. Guard at the entrance of Main Hospital building would check the Green Tag / OK Stamp of Screening 1 and Screening 2 area (situated at PRO Counter of Main Hospital Building) and Covid Sample taken Stamp of Sample collection Centre (situated at SBI e-Corner) and then only allow the patient to proceed towards Holding area. They would also check the COVID screening status of patient relatives, who are allowed inside and would not allow anyone to enter without covid status (either negative report or Green stamp from screening 1 and Screening 2 plus Covid sample taken. Signages are being displayed to guide patients from screening area towards SBI e corner and then from there towards holding area (entry through back door of Old OPD block).

10. Nurse receiving the patient in Holding area would cross check before admission (taking all precautions of minimal interaction with patient or relatives) to make sure that patient has passed Screening 1, Screening 2 and his/her Covid Sampling has been done.
11. No attendant / relative would be allowed in holding area with stable patients without covid report. If they have COVID report from a Govt approved lab, it will be honoured. If they do not have Covid report then their registration would be done at screening area itself and covid sampling ordered from our lab. They would visit to Covid sampling kiosk at SBI e Corner and would give sample along with their patient. Relatives would not be allowed to go out of hospital till their reports ofCovid becomes available. Their food arrangement will be done from hospital kitchen on payment basis. Relatives (with COVID negative status) will be allowed to wait in the Old Registration hall of main hospital building.
12. One relative would be allowed with Neonate, pregnant mother and wheel chair bound patients and would also be screened and tested for Covid before allowing entry in Holding area.
13. Unstable patients would be directed to RCH from screening area itself.
14. **Two staff nurses, 1 hospital attendant and 1housekeeping staff** will be posted in holding areas in 4 shifts (6 hours). They would follow the duty roster of 2 weeks (Active Quarantine) followed by 2 weeks of passive quarantine, as per MOHFW, Govt. of India guidelines.
15. HCWs posted in **Holding Area Zone 1** will be donning in **Full complement of PPE** while on duty, They would utilize the designated donning and doffing cubicles and perform this as per protocol. They are encouraged to take bath after their duty gets over in designated private rooms outside Holding Area Zone 1 and exit from a separate back door situated at back of Old OPD block.
16. All subspecialties will post **one SR on call** who will be actively involved in **all aspects of management** of patients admitted in this holding area. They will don and doff the full complement of PPE in the designated cubicles. If their exposure with the patient is brief (<30 Minutes) from a distance of > 1 meter, they would not require any quarantine. In rare circumstances, if the duration of contact is > 30 minutes and distance of interaction is < 1 meter, they would require to go for quarantine. (See detailed quarantine policy below).
17. Safety gear and PPE requirement will be sent to HRF according to manpower deployed in the micro plan.

18. Physical alterations needed in the Screening Area, Holding Area and Swine Flu ICU have explained to EE Civil and work has already been started.
19. In the Screening Area-2, Duty doctor or DEO will inform the S/R of concerned specialty (on-call S/R roster of all concerned specialties to be made available for needful, Ms Kusum Yadav, PRO will do this needful)
20. A special protocol has been designed for patients who require daily or twice to thrice weekly visits for chemotherapy, radiotherapy or any special treatment to hospital from following departments:
    a. Hematology department
    b. Radiotherapy department
    c. Nephrology department (Dialysis patients only)
    d. Patients on chemotherapy or special therapies from other departments. (Genetics, Endocrine surgery etc)
    e. These patients will be entering the hospital through screening area and will be enrolled in their respective treatment programme after documentation of negative COVID status.
    f. Those affording COVID testing can get it done from a government accredited private laboratory.
    g. The respective departments should organize the visits of their patients in such a way that the patient should undergo COVID at least one day prior to the scheduled visit.
    h. Their subsequent daily hospital visit will be from screening area (mandatory).
    i. On each visit they will have to undergo the standard questionnaire and last date COVID testing will be recorded in the questionnaire.
    j. All these patients will be tested again after 14 days.
    k. In between the visits if screening area feels that the patient needs to be kept in holding area and repeat testing is needed, the patient will be admitted in holding area.
    l. Department of Microbiology may design a method to label these samples separately so that sample processing may be prioritized and report may be available within 24 hours.
21. A new ward “HOLDING AREA” is created on HIS for admission of such patients.
22. Ms. Neelam Khokhar, DNS will be the Sister In charge of Holding area.

23. HRF counter will be activated from 4th may, 2020 as Mr. Abhay Mehrotra, SPO has informed that unit of HRF already existed in the Holding area and will function as per demand on payment basis.
24. Roster of HCWs posted in the Holding area will be prepared and provided by persons mentioned in the Office Order No PGI/CMS/Estt/1306/2020 dated 30/4/2020 and would be as follows;
    a. Roster for SR/JR at screening area by Dr Alok Nath of Pulmonary Medicine
    b. Neonatology and MRH SR – by respective dept
    c. Data Entry Operator and PRO roster: by CMS office / Ms Kusum Yadad, PRO
    d. Nursing staff roster by CNO
    e. Patient helper- by Mr Nikhil Chandra, SAO
    f. Sanitation- by Dr R Harshvardhan
25. Ms Neelam Khoker will collect the Nursing, Patient helper and Sanitary worker roster from appropriate person, as mentioned above.
26. All HODs are requested to send the on-call roster of residents / faculty who shall attend the calls from holding area, about clinical management of these patients.
27. All the departments are advised to divide their workforce in two groups. Those who would attend the calls from holding area (zone-1) should be working for full 7 days and should not be mingling with other members of department for these 7 days because in a remote possibility of a patient turning out positive in holding area, only this HCW will need to be quarantined, mitigating workforce shortage in various departments.
28. Donning and Doffing of HCWs entering Holding Area Zone 1 would be supervised by Ms Rachna (Nurse) and her team.
29. The sample collection center at SBI e-Corner has been made functional. This center will be responsible for samples of patients coming to screening, holding area and all wards areas in main PGI building and PMSSY block. The stable patients once tagged green from the screening area-2 will be sent to SBI corner sampling center where their form will be stamped “SAMPLE TAKEN” and there after they will go & get admitted in holding area.
30. Sample collection center at SBI e corner is functional from 9AM to 5PM only. Patients coming after the routine time, would be sampled at Holding area by on call resident from Microbiology. **Dr Ujjawla Ghoshal may kindly be requested for the same**. On call resident would collect sample after wearing full PPE. For practical purposes, he

can collect sample in batches, like every 4 hourly when few patients get accumulated in holding area.

31. **Quarantine Policy:** HCWs posted in this area (Nursing staff, patient helper and Sanitation worker) will be following pattern of 2 weeks of duty (active quarantine) and 2 weeks of passive quarantine and tested before release from quarantine.

    Quarantine policy for residents will be like this.

    i. Resident on call will start Active Quarantine, the day he visits any patient in holding area
    ii. He / She is supposed to follow covid report of the patients attended by him, by next day.
    iii. If all the patients attended by him turn out to be Covid Negative, he/she would not require passive quarantine.
    iv. If any patient attended by him becomes positive, he / she will go for passive quarantine of 14 days and quarantine protocol of our institute would be applicable on him / her.

    Residents attending the calls in holding area would not require quarantine if their exposure with patient is brief (less than 30 Minutes with more than 1 meter of distance away). They would be sent for quarantine, if the exposure is more than brief or if patient attended by them turns out to be positive.

    a. If any HCW comes out positive than entire team would require to be quarantined.
    b. Quarantine committee has been informed to arrange the facility for their stay in hospital campus during active quarantine.
    c. If any patient turns out to be positive then the Holding Area Zone 1 (Palliative care ward) would be closed and patient would be shifted to Swine Flu ICU, and Swine Flu ICU would be prepared and kept ready as backup area for patient holding.

32. **Kitchen / Food Policy:** Nursing staff would order the food from kitchen for admitted patients. Since we are not allowing relatives to go out frequently, food for them would be arranged from hospital kitchen on payment basis. Dr Anita Saxena has kindly consented for this arrangement.

33. **Radiology services:** It is strongly recommended that any radiological imaging should be kept on hold till Covid report becomes available and should be ordered only if urgency exists for the same. Portable Xray and USG machine available in holding area would be used for this purpose. HCW from radiology dept would be allowed inside with full PPE but *would not require quarantine*. If any emergent CT scan is required, the patient would be shifted to PMSSY CT room from back door of Old OPD block, designated for this purpose. Prof Sunil Jain, HOD Radiodiagnosis to be requested for these arrangements. Prof Punita Lal, HOD Radiotherapy has kindly consented to provide a portable USG machine of their ward with all 3 probes (Linear, Convex and Cardiac probes) to be shifted to Holding area zone 1 for this purpose.
34. **Entry and Exit points for holding area:** Patients would go from screening area to SBI e corner for Covid sample collection. After that they would enter the holding area through back door of Old OPD block (They can follow signages and Guards would also direct them). Three separate exit points exist at the back side of Old OPD block, specific exit point would be used for exit in 3 different circumstances earmarked for that purpose only;
    a. One point would be used for entry of patients, and for shifting patients requiring CT scan in PMSSY building
    b. Second exit for Covid Positive patients for transfer to RCH. **Same door would be used for Biomedical waste disposal.**
    c. Third exit point would be used by Neonatology and MRH patients.
    d. Exit of HCWs after doffing and bathing, after the end of their duty would be through a separate point at opposite side of old OPD block.
    e. Patients with Negative Covid status, who would require to be transferred to G Block / PMSSY block, would use the old OPD block corridor and then through old registration hall enter in G Block.
35. **Sanitization Policy:** Regular sanitization and disinfection of the entire corridor, holding area and back side area after exit points (Backyard of old OPD block, which would be used for transferring patients to RCH) would be performed under supervision of Dr Richa Mishra, Microbiology. Dr Richa Mishra has kindly consented to prepare SOP and designate persons for the same.
36. **Biomedical Waste:** BMW management would be done as per the protocol. In unfortunate incidence of death of any patient, Dead Body Disposal would be performed

as per already circulated guidelines. Dr R Harshvardhan would provide necessary support in this regard.

37. A Control room would be set up near screening area by Dept of Hospital administration. They would post their staff / PG student, who would report to CMS / Nodal officer of holding area. Dr R Harshvardhan has kindly consented for the same.
38. Transport committee (Land line Nos 4070 / 4071 and CUG 8765977853) would be contacted if any patient requires shifting from Holding area to Covid hospital or to PMSSY for CT scan.
39. Phone Numbers related with this entire arrangement:
    a. Land line Phone Nos of Screening 2 Area: 4070 and 4071.
    b. A separate CUG would be provided to duty doctor at screening 2 and number of the same would be intimated later.
    c. Nursing counter outside holding area: 4075. (Medical Oncology ward) This would provide necessary support of providing PPE kits to on call residents.
    d. Landline No of Holding area: 4823 (Palliative Care ward Nursing station)

Plan of action, in case of any patient is found Covid-19 Positive in holding area. (as per the guidelines received from UP Govt wide order No. 1083/PANCH-5-2020 dated 12/5/2020)

Following SOPs were decided in meeting in director office in presence of Director and Nodal Officer RCH.

1. Any patient who comes out to be Covid-19 positive in Primary holding area, would be transferred to RCH by a dedicated ambulance with all due precautions as per govt. guidelines, immediately.
2. Patients in holding area, who are admitted adjacent to this positive patient (in same cubicle) would be labelled as high risk contacts and would be kept separately in isolation rooms of Primary / secondary holding area (Medical Oncology ward), depending upon the bed availability.
3. *RT-PCR test of all these high-risk contact patients would be done on 5th day and they would be quarantined for 14 days and would be followed for development of any symptoms related to Covid-19 disease. They would be repeat tested on 14th day or on the day of development of symptoms. They would be shifted to destination ward only*

after Negative Covid-19 result on 14th day and would remain isolated in secondary holding area till then.

4. *All those high-risk patients, whose RT-PCR report on 5th day comes negative, can be sent home on 10th day with advice for Home isolation, if patient's clinical condition permits and treating dept. decides to discharge them. Treating dept. must advise an RT-PCR Covid test of these patients on 14th day on OPD basis, as per govt. guidelines*
5. Since patients admitted in other cubicles of holding area are not exposed to the positive patient, they would be shifted to their destination wards, once their RT PCR report comes negative.
6. Secondary holding area (Holding Area 2) has been created in Medical Oncology ward (Old OPD Block) which can be utilised in future, as and when the number of patients exceed the capacity of Primary holding area (Holding Area 1).
7. Additional donning area has been made just outside the Radiotherapy ward (Old OPD block), which will be used for wearing PPE by HCWs entering secondary holding area. Doffing area would continue to remain same as earlier.
8. All patients and their relatives would continue to wear masks as per govt guidelines circulated from time to time.
9. To minimise the risk of cross infection, patients and their relatives will remain in the cubicles of their admission. They would not go and mingle with patients in other cubicles.
10. Patients staying in the same cubicle would be shifted together once report of all patients comes out negative. This would reduce the possibility of shifting of any patient exposed to a positive patient in holding area to main hospital building. Nursing in-charge would ensure that patients admitted around same time are staying in one cubicle.
11. Cubicle of holding area, which had a positive patient, would be sealed and sanitised as per govt. guidelines and would remain closed for 24hrs, till disinfection is complete, as per govt. guidelines.
12. Patients admission would continue in remaining cubicles of holding area.
13. Outside Nursing Station, which is functioning from Radiotherapy ward, would be be shifted to Genetics Ward (Old OPD Block). Land Line No of this Outside Nursing Station is 4078.
14. Additional nursing staff would be required for managing these patients in secondary holding area. (CNO to prepare a contingency roster of nursing staff and be ready always, in case any such need arises)

15. A guard is available 24 hours at entry/exit gate of holding area to monitor / regulate patients/relatives movement. Land line number of this Entry/ Exit gate of holding area is 4822.
16. Already available SOPs of holding area would remain in place and above plan is in supplement to already circulated micro plan wide various office orders mentioned below (and Attached for ready reference);
    i. Office Order No. PGI/CMS/Estt/1362/2020 dated 07/05/2020
    ii. Office Order No. PGI/CMS/Estt/1479/2020 dated 19/5/2020
    iii. Office order No PGI/CMS/Estt/1490/2020 dated 20/5/2020

SANJAY GANDHI POST GRADUATE INSTITUTE OF MEDICAL SCIENCES

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DEPARTMENT OF MICROBIOLOGY

INFECTION PREVENTION & CONTROL GUIDELINES FOR COVID-19

CONTENTS

INTRODUCTION

In view of pandemic due to novel coronavirus (SARS CoV-2), posing a public health threat due to its spread and contagiousness. Healthcare workers (HCW) are at risk of infection. In view of the current situation regarding COVID -19 disease in the state of Uttar Pradesh, we have prepared this document for the handling of suspected and confirmed cases, who might present to the SGPGIMS, Lucknow.

Standard recommendations to prevent infection spread include standard precautions, contact precautions and respiratory precautions.

Patients suspected of having 2019-nCoV infection should be shifted to the isolation facility from the triage area as soon as possible. The HCP should do this after donning appropriate PPE. The patient should wear mask.

1. Standard precautions

Health-care workers caring for patients should implement standard infection control precautions.

These include

- **Hand hygiene**
- **Use of personal protective equipment**
- **Respiratory etiquettes**
- **Environmental disinfection**

ADVICE ON THE USAGE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

CHECKLIST FOR WEARING PERSONAL PROTECTIVE EQUIPMENT- DONNING

S.No	STEPS	YES	NO
1.	**Select appropriate size of PPE** and **pre label the VTM** with patient name, CR number and secure it with cellophane tape to prevent dampening in case of spill		
2.	**Remove all the personal items** like bangles, watch, finger rings, necklace, ear rings, threads in the hand and neck, mobile phone, pen, finger nail(<1/4 inch) etc.,		
3.	Donning procedure is performed under the supervision of an observer gives verbal commands and maintains a checklist to ensure complete ensemble of PPE **(Note: Hand rub bottle will be touched only by the observer)**		
4.	Instruct the HCW to attend the personal needs like using washroom and hydrating before wearing the PPE		
5.	Observer puts 1 complete puff of hand rub into the hands of collector and instructs to **perform proper hand hygiene**		
6.	**Put on a boot cover** - Performer sits in the donning area on a stool and wears the boot covers, making sure not to touch the floor or the boots, please perform hand hygiene before putting the inner gloves.		
7.	**Put on nitrile gloves** as the pair of inner gloves, making sure the cuffs are worn as far up of the arm as possible		
8.	**Put on the gown** - Inspect the gown has no tears or holes, wear it methodically and observer ties the behind strap and the side tie as snuggly as possible(making sure comfortable to the performer)		

9.	**Optional step: Tape the sleeve** with the inner glove to fill the separation between the sleeve and inner glove (make a fold at the end of the tape to facilitate easy removal)		
10.	**Put on N95 respirator** - hold the respirator in the palm of your right hand with the straps facing the floor, and place the respirator on the face covering the nose and mouth. Pull the bottom strap up and over the top of the head and put it behind the head below the ears. pull the upper strap over the head on to the crown. Press the ridge of the nose to obtain a tight seal, and perform fit check to ensure a tight seal		
11.	**Put on the surgical hood** – slowly pull it over the head and shoulder Trained observer inspects to see no skin or hair is visible		
12.	**Put on the outer apron(Optional)** – if patient is having diarrhea or vomiting, or if performing aerosol generating procedures or procedures with risk of body fluid exposure		
13.	**Put on the outer gloves** – use latex gloves and pull the cuff as up of the arm as possible above the sleeve of the gown (Different coloured gloves ensure rapid identification of any breach in the integrity in the outer gloves during procedures)		
14.	**Put on the protective Goggles provided in kit face shield** (Optional)		
15.	**Verify** - Observer confirms all the equipment are serviceable and donned successfully		
16.	Observer asks the performer to extend the arms, bend at the waist to ensure comfortable range of movements without exposure of the skin during movement		

CHECKLIST FOR REMOVING PPE – DOFFING

S. No	STEPS	YES	NO
1.	**Inspect the PPE for any signs of visible contamination**, if so disinfect with Microgen spray before leaving the patient area and also disinfect the gloves with hand rub		
2.	**Check for any rips**		
3.	**Change the outer gloves** – with hand rub		
4.	**Remove the outer apron (Optional)** – observer will help untying the straps present behind. Pull the apron to outside away from the body by breaking the strap and roll it with inside to outside and discard it in the bin – inspect PPE to look for any tears(if so disinfect with EPA registered wipes)		
5.	**Disinfect the outer gloves** – with hand rub		
6.	**Remove the boot cover –** Sit on the chair 1 (dirty chair) and make sure not to touch one leg with the other. Grasp the outside of the boot cover and pull it down , then lift the boot cover over the heel and pull it off the foot and dispose it.		
7.	**Disinfect the outer gloves** – with hand rub		
8.	**Remove the outer gloves –** hold palm facing up and pinch the gloves at wrist and pull it down carefully and hold it in the palm of other hand. Slide a finger down inside the other glove and pull it down and discard it in the bin **Note: Inspect the inner gloves for tear or any contamination – if so disinfect with hand rub and remove it and perform hand rub and wear a new gloves**		
9.	**Disinfect the inner gloves** – with hand rub		

10.	**Pull off the Eye goggles/face shield (Optional)**		
11.	**Disinfect the gloves** – with hand rub		
12.	**Remove the hood –** bend the head slightly and grasp the hood at the crown away from the body and off the head. Dispose it		
13.	**Disinfect the gloves** – with hand rub		
14.	**Remove the gown –** Release the tie. Grasp the gown at hip area and pull the gown away from the sides of the body, once the gown is away from the shoulder then pull one arm at a time from the sleeves of the gown. Then roll the gown inside out and dispose it.		
15.	**Disinfect the gloves** – with hand rub		
16.	**Remove the inner gloves –** same as earlier **Note: Don't touch your face with bare hands**		
17.	**Disinfect the hands**– with hand rub		
18.	**Put on a fresh pair of gloves**		
19.	**Remove the N95 respirator –** tilt the head forward, use 2 hands to grab the bottom strap, pull to the sides and over the head**,** repeat same for upper strap. Make sure to keep tension on the upper strap as you remove it, which will let the mask fall forward. Discard it. **Note: Donot touch the front part of the respirator**		
20.	**Disinfect the gloves** – with hand rub		
21.	**Sit down in the clean chair to disinfect the shoes** using EPA registered wipes including soles **(don't touch the ankles)**		
22.	**Disinfect the gloves** – with hand rub		
23.	**Remove your gloves**		
24.	**Perform hand wash**		

25.	**Inspect clothes for rips tears and contamination**	
26.	**Remove the scrubs and bath with soap and water**	

GUIDELINES FOR SAMPLE COLLECTION AND LABORATORY PROCESSING FOR DIAGNOSIS OF SARS: CORONA VIRUS 2

General guidelines

- Trained health care professionals to wear appropriate PPE while collecting the sample
- Restricted entry to visitors or attenders during sample collection
- Specimens should be collected as soon as possible once a suspected case is identified regardless of time of symptom onset.
- Label each specimen container with the patient's CR number, name, ward, specimen type and the date of collection
- Fill the requisition form completely (NIV, Pune Form provided separately)
- Transport immediately at 4 ^{0} C (Thermocol box with gel Pack) to virology lab, 2nd floor, C block, SGPGIMS, LKO.
- Proper disposal of all waste generated according to the institute guidelines

Samples to be collected

1. **In conscious corporative patient**: Upper respiratory tract – oropharyngeal swab (Collected in nylon/ Dacron swab and put inside the viral transport media)
2. **In unconscious intubated patient:** Lower respiratory tract – Endotracheal aspirate/ Bronchoalveolar lavage. (Collect 2-3 mL into a sterile, leak-proof container)

Note: Induced sputum samples are not indicated, due to the risk of aerosol generation

Procedure of Oropharyngeal swab collection

- Ask the patient to open mouth
- Rub swab over both tonsillar pillars and posterior oropharynx
- Keep the swab inside the viral transport media (VTM) after breaking the extra plastic stick and close the cap
- Place this VTM in secondary plastic container (50 ml falcon tube) without touching the secondary container
- Secondary container is put inside the zip lock pouch into the cold chain
- The whole assembly is put inside thermocol box with ice packs.

Note: 1. Avoid touching the tongue, teeth and gums

2. **Use the swab provided by Microbiology department**
3. **Do not use routine calcium alginate swabs or swabs with wooden shafts Storage of samples**

Samples can be stored at 4^{o} C for up to 72 hours, however department of Microbiology recommend immediate transfer to Microbiology department.

ENVIRONMENTAL CLEANING IN HEALTHCARE FACILITIES

Scope: To provide interim guidance about the environmental cleaning / decontamination in triage area and COVID-19 ward at SGPGIMS, Lucknow

Practices for Environmental Cleaning in Healthcare Facilities

- Environmental cleaning is part of Standard Precautions, which should be applied to all patients in all healthcare facilities

General instruction

Personal Protective Equipment (PPE) to wear while carrying out cleaning and disinfection works

- Wear heavy duty/disposable gloves, disposable long-sleeved gowns, eye goggles or a face shield, and a medical mask
- Avoid touching the nose and mouth
- Disposable gloves should be removed and discarded if they become soiled or damaged, and wear a new pair
- All other disposable PPE should be removed and discarded after cleaning activities are completed according to the guidelines

Where possible, seal off areas where the confirmed case has visited, before carrying out cleaning and disinfection

FACILITY BASED CLEANING GUIDELINES:

At T1 Triage: The health care worker will perform the first assessment without direct physical contact. The HCW should wear the surgical mask and also provide one surgical mask to the patient.

At T2 Triage: The health care worker will perform the assessment with close physical contact with patient , thus HCW should wear full PPE with N95 respirator.

At T3 Triage and COVID ward : The health care worker should wear full PPE with N95 respirator.

Table 1: Cleaning guidelines in Triage area T1 and T2

S.No	Triage Area	Disinfection method	Process and frequency
1.	General cleaning of floor	Detergent & warm water mop. 2 buckets cleaning.	Mop floors with hot water and detergent (Do not pour the water.) **Note: Should be done every 8 hourly**
2.	Table, lockers, cupboard, benches, Barrier railings, Chair	Damp dusting followed by H2O2 disinfectant.	Damp mopping with warm water with detergent, followed by disinfection with hydrogen peroxide disinfectant wipes (Oxivir) Remove any marks under arms and seat. **Note: Should be done every 8 hourly**
3.	Telephone/ CUG	Alcohol based Rub	Wipe with Alcohol based wipes. (Kim Wipes moistened with Avaguard/Microshield blue) **Note: Should be done every 4 hourly**

4.	Light switch	Damp dusting followed by H2O2 disinfectant.	Light switches to be cleaned of dust, spots and finger marks. Clean with a damp cloth (never wet) and detergent. Wipe with Hydrogen peroxide disinfectant wipes (Oxivir) **Note: Should be done every 8 hourly**
5.	Stethoscope BP cuff	Alcohol based Rub	Wipe with Alcohol based wipes. (Kim Wipes moistened with Avaguard/Microshield blue) **Note: Should be done after every use.**

Table 2: Cleaning guidelines in Triage T3 and COVID – 19 ward

S NO.	Area	Disinfection Method	Process and frequency
1.	Floor	Damp mopping followed by mopping with 1% Virex.	Sweep with the damp mop to remove surface dust. Prepare cleaning solution using detergent with warm water. Use the **three-bucket technique** for mopping the floor one bucket with plain water and one with the detergent solution • First mop the area with the warm water and detergent solution. • After mopping clean the mop in plain water and squeeze it. • Mop area again using 1%Virex after drying the area. • In between mopping if solution or water is dirty change it frequently. • Mop the floor starting at the far corner of the room and work towards the door. • Clean articles between cleaning. **Note: Mopping should be done once in 8 hours If confirmed cases are discharged/ died terminal cleaning should be conducted – for any details of special instructions contact infection control team, Microbiology, SGPGIMS**
2.	Ceilings and side walls	Damp mopping followed by mopping with 1% Virex	Damp dusting with a long Handled tool for the walls and ceiling done with very little moisture. Damp dusting should be done in straight lines that overlap one another using Virex 1%. **Note: Should be done once every 8 hours**

3.	Table, lockers, cupboard, benches, Barrier railings, Chair	Damp dusting followed by H2O2 disinfectant.	Damp mopping with Warm water and detergent, followed by disinfection with hydrogen peroxide disinfectant wipes (Oxivir) Remove any marks under arms and seat. **Note: Should be done every 8 hourly.**
4.	Ventilator (exterior) , Infusion pump, USG machine, Telephon e computer, keyboard, printer, Bed side monitor, ECG probes	Alcohol based Rub	Wipe with Alcohol based wipes. (Kim Wipes moistened with Avaguard/Microshield blue)
6.	Light switch	Damp dusting followed by H2O2 disinfectant.	Light switches to be cleaned of dust, spots and finger marks. Clean with a damp cloth (never wet) and detergent. Wipe with Hydrogen peroxide disinfectant wipes (Oxivir) **Note: Should be done every 8 hourly**
7.	Doors and door knobs	Damp dusting followed by H2O2 disinfectant.	Damp mopping with Warm water and detergent, followed by disinfection with hydrogen peroxide disinfectant wipes (Oxivir): **Once daily** Door knobs and other frequently touched surfaces should be cleaned 8 hourly followed by disinfection with hydrogen peroxide disinfectant wipes (Oxivir)
8.	Stethosco pe, Pulse oximeter	Alcohol based Rub	Wipe with Alcohol based wipes. (Kim Wipes moistened with Avaguard/Microshield blue) Note: Should be done after every use. **Disposable equipment are recommended**

10.	Thermom eter	Alcohol based hand rubs	Wipe with Alcohol based wipes • Store in individual holder inverted • Preferably one thermometer for each patient
11.	Injection and dressing trolley	Detergent and water mopping followed by Alcohol based hand Rubs	Damp mopping with Warm water and detergent, followed by disinfection Alcohol wipes **Note: Should be done every 8 hourly.**
12.	Refrigerat or	Detergent and water Absorbent paper	Empty the fridge and store things appropriately. Defrost, decontaminate and clean with detergent. Dry it properly and replace the things. **Weekly cleaning is recommended.**

Table 3: Cleaning guidelines for Toilet in COVI-19 ward

S. No.	COVID – 19 ward	Disinfection method	Process and frequency
1.	Showers area Taps and fittings	Warm water Detergent powder Nylon Scrubber	Thoroughly scrub the floors/tiles with warm water and detergent. • Wipe over taps and fittings with a damp Cloth, detergent and dried after cleaning • Care should be taken to clean the underside of taps and fittings.
2.	Outside sink	Soap powder and nylon scrubber	Scrub with the nylon scrubber.
3.	Toilet pot/ commode	Sodium hypochlorite 1% / Soap powder / long handle angular brush	Inside of toilet pot/commode: Scrub with the recommended agents and the long handle angular brush Outside: Clean with recommended agents; use a nylon scrubber
4.	Toilet floor	Soap powder and scrubbing brush/ nylon broom	Scrub floor with soap powder and the scrubbing brush • Wash with water • Use sodium hypochlorite1% dilution

Table 4: Guidelines for Spill management

S.No	Spill management	Disinfection method	Process and frequency
1.	**All patient care areas/ Laboratory**	Spill care kit - Sodium hypochlorite (1%), Absorbent paper Gloves Forceps Yellow bag Mop and Hot water	1. Wear full PPE 2. Remove if any broken pieces of glass and sharps, using a pair of forceps. 3. Pour sodium hypochlorite (1%) and cover with absorbent paper. 4. Wait for 20 minutes. 5. cover the spill with absorbent paper 6. Clean up and discard absorbent paper into yellow infectious waste bin. 7. Mop the area with soap and hot water.

WASTE MANAGEMENT (As per recent guidelines of Central pollution control board)

The surface or material known to be, or potentially be, contaminated by biological agents during laboratory operations must be correctly disinfected to control infectious risks. Proper processes for the identification and segregation of contaminated materials must be adopted before decontamination and/or disposal. The contaminated waste must be packaged in a leak proof manner, for transfer to decontamination capacity.

Category	Type of Bag/ container	Type of waste	Treatment disposal options
Yellow	Non chlorinated color coded bags in colored bins	Human anatomical waste, Soiled waste, Expired or discarded medicines, Chemical waste and clinical lab waste.	Incineration
Red	Non chlorinated plastic bags in colored bins/ containers	Contaminated plastic waste like tubing, bottles, urine bags, syringes(without needles) and gloves	Autoclave
White	Translucent, puncture, leak and tamper proof	Waste sharps including metals	Autoclave
Blue	Water proof card board boxes/ containers	Glassware waste	Autoclave

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6. Handbook of COVID-19 prevention and treatment, Zhejiany university school of medicine, Wuhan, China.
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8. Central pollution control board guidelines on handling of waste generated during treatment of covid-19 patient.
9. COVID -19 guidelines on dead body management, ministry of health and family welfare, New Delhi

Guidelines for Home Isolation of Pre-symptomatic Asymptomatic, Very Mild and Mild COVID-19 cases

Scope of guidelines

In view of large number of asymptomatic cases being detected, the MoHFW has already published guidelines for allowing home isolation of ***asymptomatic, very mild and mild cases of COVID-19*** dated 10th May 2020.

These guidelines apply to home isolation of ***asymptomatic, very mild and mild cases of COVID-19 in the State of Uttar Pradesh*** if he he/she has requisite facility for home isolation at his/her residence.

Eligibility for home isolation

a. The person should be clinically assigned as a very mild case/ pre-symptomatic case by the treating medical officer.
b. Patients < 3 years or > 65 years of age, pregnant mothers or with pre-existing severe uncontrolled medical or surgical conditions such as uncontrolled diabetes mellitus, decompensated liver disease, ESRD requiring maintenance haemodialysis, patients on immunosuppressive medications, uncontrolled asthma/COPD/OSAHS, decompensated congestive heart failure etc should not be considered for home isolation.
c. Patients eligible for home isolation after excluding above conditions should have the requisite facility at their residence for self-isolation and also for quarantining the family contacts i.e. a separate well-ventilated room and preferably a separate toilet.
d. All patients under home isolation will be required to purchase a thermometer and pulse oximeter for monitoring of their health status
e. If anybody in patient's house is above 60 years of age, is pregnant or has any severe medical condition like cancer, severe asthma, uncontrolled diabetes mellitus, serious cardiovascular disease or end stage renal disease requiring haemodialysis, renal disease etc., he or she should be shifted to another house till the patient recovers. In such situations, it is not safe to keep home quarantine for a COVID patient, as it can be dangerous for anyone with a compromised health condition.
f. A care giver should be available to provide care on 24 x7 basis. A communication link between the caregiver and hospital is a prerequisite for the entire duration of home isolation.

g. All family members of diagnosed/suspected COVID-19 patients in the house should take Hydroxychloroquine as per the doctor's prescription. The below mentioned persons should not take Hydroxychloroquine unless specifically prescribed –
    i. Those below 15 years
    ii. Those suffering from allergies
    iii. Heart Patients
    iv. Those undergoing treatment for any diseases
h. Arogya Setu App on mobile should be downloaded (available at: https://www.mygov.in/aarogya-setuapp/) and it should remain active at all times (through Bluetooth and Wi-Fi)
i. The patient shall agree to monitor his health and regularly inform his health status to the District Surveillance Officer for further follow up by the surveillance teams. A self-monitoring form (Annexure I) has to be duly filled in daily and informed to the office of DSO.
j. The patient will fill in an undertaking on self-isolation (Annexure II) and shall follow home quarantine guidelines. Such individual shall be eligible for home isolation.
k. In addition to the guidelines on home-quarantine available at: https://www.mohfw.gov.in/pdf/Guidelinesforhomequarantine.pdf , the required instructions for the care giver and the patient as in Annexure III shall be also followed.

When to seek medical attention

Patient / Care giver will keep monitoring their health. Immediate medical attention must be sought if serious signs or symptoms develop. These could include

i. Difficulty in breathing,
ii. Persistent pain/pressure in the chest,
iii. Mental confusion or inability to arouse,
iv. Developing bluish discolorations of lips/face and
v. As advised by treating medical officer

When to discontinue home isolation

Patient under home isolation will end home isolation after 17 days of onset of symptoms (or date of sampling, for pre-symptomatic cases) and no fever for 10 days. There is no need for testing after the home isolation period is over.

Annexure I

Self-Monitoring Chart

	Pulse Rate		Temperature		SpO2		Remarks
	Morning	Evening	Morning	Evening	Morning	Evening	
Day 1							
Day 2							
Day 3							
Day 4							
Day 5							
Day 6							
Day 7							
Day 8							
Day 9							
Day 10							
Day 11							
Day 12							
Day 13							
Day 14							
Day 15							
Day 16							
Day 17							

Annexure II

Undertaking on self-isolation

I …… S/W of ……., resident of …… being diagnosed as a confirmed/suspect case of COVID-19, do hereby voluntarily undertake to maintain strict self-isolation at all times for the prescribed period. During this period I shall monitor my health and those around me and interact with the assigned surveillance team/with the call centre (1800-180-5145), in case I suffer from any deteriorating symptoms or any of my close family contacts develops any symptoms consistent with COVID-19. I have been explained in detail about the precautions that I need to follow while I am under self-isolation. I am liable to be acted on under the prescribed law for any non-adherence to self-isolation protocol.

Signature_____

Date_____

Contact Number _____

Annexure III

Instructions for caregivers

1. Mask: The caregiver should wear a triple layer medical mask appropriately when in the same room with the ill person. Front portion of the mask should not be touched or handled during use. If the mask gets wet or dirty with secretions, it must be changed immediately. Discard the mask after use and perform hand hygiene after disposal of the mask.
2. He/she should avoid touching own face, nose or mouth.
3. Hand hygiene must be ensured following contact with ill person or his immediate environment.
4. Hand hygiene should also be practiced before and after preparing food, before eating, after using the toilet, and whenever hands look dirty. Use soap and water for hand washing at least for 40 seconds. Alcohol-based hand rub can be used, if hands are not visibly soiled.
5. After using soap and water, use of disposable paper towels to dry hands is desirable. If not available, use dedicated clean cloth towels and replace them when they become wet.
6. Exposure to patient: Avoid direct contact with body fluids of the patient, particularly oral or respiratory secretions. Use disposable gloves while handling the patient. Perform hand hygiene before and after removing gloves.
7. Avoid exposure to potentially contaminated items in his immediate environment (e.g. avoid sharing cigarettes, eating utensils, dishes, drinks, used towels or bed linen).
8. Food must be provided to the patient in his room
9. Utensils and dishes used by the patient should be cleaned with soap/detergent and water wearing gloves. The utensils and dishes may be re-used. Clean hands after taking off gloves or handling used items.
10. Use triple layer medical mask and disposable gloves while cleaning or handling surfaces, clothing or linen used by the patient. Perform hand hygiene before and after removing gloves.
11. The care giver will make sure that the patient follows the prescribed treatment.
12. The care giver and all close contact will self-monitor their health with daily temperature monitoring and report promptly if they develop any symptom suggestive of COVID-19 (fever/cough/difficulty in breathing)

Instructions for the patient

1. Patient should always use triple layer medical mask. Discard mask after 8 hours of use or earlier if they become wet or visibly soiled.
2. Mask should be discarded only after disinfecting it with 1% Sodium Hypochlorite.

3. Patient must stay in the identified room and away from other people in home, especially elderlies and those with co-morbid conditions like hypertension, cardiovascular disease, renal disease etc.
4. Patient must take rest and drink lot of fluids to maintain adequate hydration
5. Follow respiratory etiquettes all the time.
6. Hands must be washed often with soap and water for at least 40 seconds or clean with alcohol-based sanitizer.
7. Don't share personal items with other people.
8. Clean surfaces in the room that are touched often (tabletops, doorknobs, handles, etc) with 1% hypochlorite solution.
9. The patient must strictly follow the physician's instructions and medication advice.
10. The patient will self-monitor his/her health with daily temperature monitoring and report promptly if develops any deterioration of symptom as detailed below.

Instructions for Neighbours of Covid-19 Patients

1. If there are any Corona patients in your building under Home Isolation, do not panic. Follow basics self-hygiene measures and precautions to keep yourselves safe.
2. Keep your surroundings clean.
3. Ensure that the common spaces of your apartment building/flat such as lifts, or stairs are sanitized twice a day with 1% sodium hypochlorite solution.
4. Remember, the fight is against the disease, not the sick. Do not cause any kind of trouble for the patient or their family members.
5. If any person, stamped for isolation, is seen stepping out, call 1800-180-5145 immediately.
6. Wash your hands with soap and water for 40 to 60 seconds every time you come from outside.
7. Please take care of COVID-19 Patient. Do not hurt him/her because he/she is symptomatic. Your positive support can prevent further infection.
8. Help the patient until they get cured. If they need any essential items like medicine, ration, vegetables, etc., help them by leaving them outside the door of their house. Avoid exchange of currency until the patient has recovered.
9. For any assistance, call the Corona Helpline Service 1800-180-5145

NUTRITION GUIDE

VEGETARIAN

Do's	Don'ts
 Eat whole grains such as brown rice, whole wheat flour, oats, millets, etc.	Avoid eating maida, fried &junk food (chips, cookies etc). 
 Include beans, lentils & pulses as these are good sources of protein	Avoid sugary or packed juices & carbonated drinks as these are very low in nutrients. 
 Include fresh fruits & vegetables (Bright coloured fruits & vegetables like red capsicum, carrots, beetroot &greens etc)	Avoid eating cheese, coconut & palm oil, butter as they are unsaturated fats and are unhealthy. 
 Drink 8-10 Glasses of water and Hydrate yourself. Water helps to flush out toxins.	
 Citrus fruits like lemons & oranges are a good source of Vit C which is key in improving immunity levels & to fight off infections.	
 Include spices like ginger, garlic & turmeric which are natural immunity boosters.	
 Eat home cooked food. Use low fat and less oil for cooking food.	
 Wash fruits & vegetables before use Include Low fat milk & yogurt as they are good sources of protein &calcium.	

NON - VEGETARIAN

Do's	Don'ts
 Store non veg items separately from fresh products.	Avoid mutton, liver, fried & processed meats. 
 Include lean animal protein like skinless chicken, fish &egg whites.	Limit Non Veg intake to 2-3 times per week. 
	Limit intake of whole eggs to once a week. 

आत्मना सर्गो जितः

SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES, RAE BARELI ROAD, LUCKNOW- 226014

Micro-plan for functioning of Isolation facility for Health Care workers

I. Who can be admitted ?

- A**symptomatic** Covid positive health care workers of the institute who do not have adequate home isolation facility as per the guidelines

II. Who will decide admission ?

- Health Care worker Infection Committee: Protocol for admission to and discharge from isolation facility will be as per institutional guidelines. Criteria for admission of HCW to isolation facility to be developed by HCW committee and implemented after due approval by competent authority

III. Movement of Covid positive HCW

- Transport of HCW from active quarantine/ other area to isolation for HCW to be done by transport committee / PRO counter and to be coordinated by Dr R P Singh.
- Entry / Exit for phase I of Isolation for HCW, will be from the Fire exit of the old OPD area towards plaza
- One guard 24 hrs will be deployed at the backside door of the facility (landline no: 4822).

IV. Procedure for admission

- Separate department in the name of "Isolation for HCW" has been created on HIS with 05 isolation and 07 general beds in Phase I. Admission rights have been given to Chairman HCW infection committee and Nodal Officer, Isolation management Committee (IMC).
- Once the decision to admit a HCW in the isolation for HCW is made Chairman / nominee, HCW infection committee will inform Nodal Officer/ nominee, Isolation Management committee through whatsapp on the format provided below:

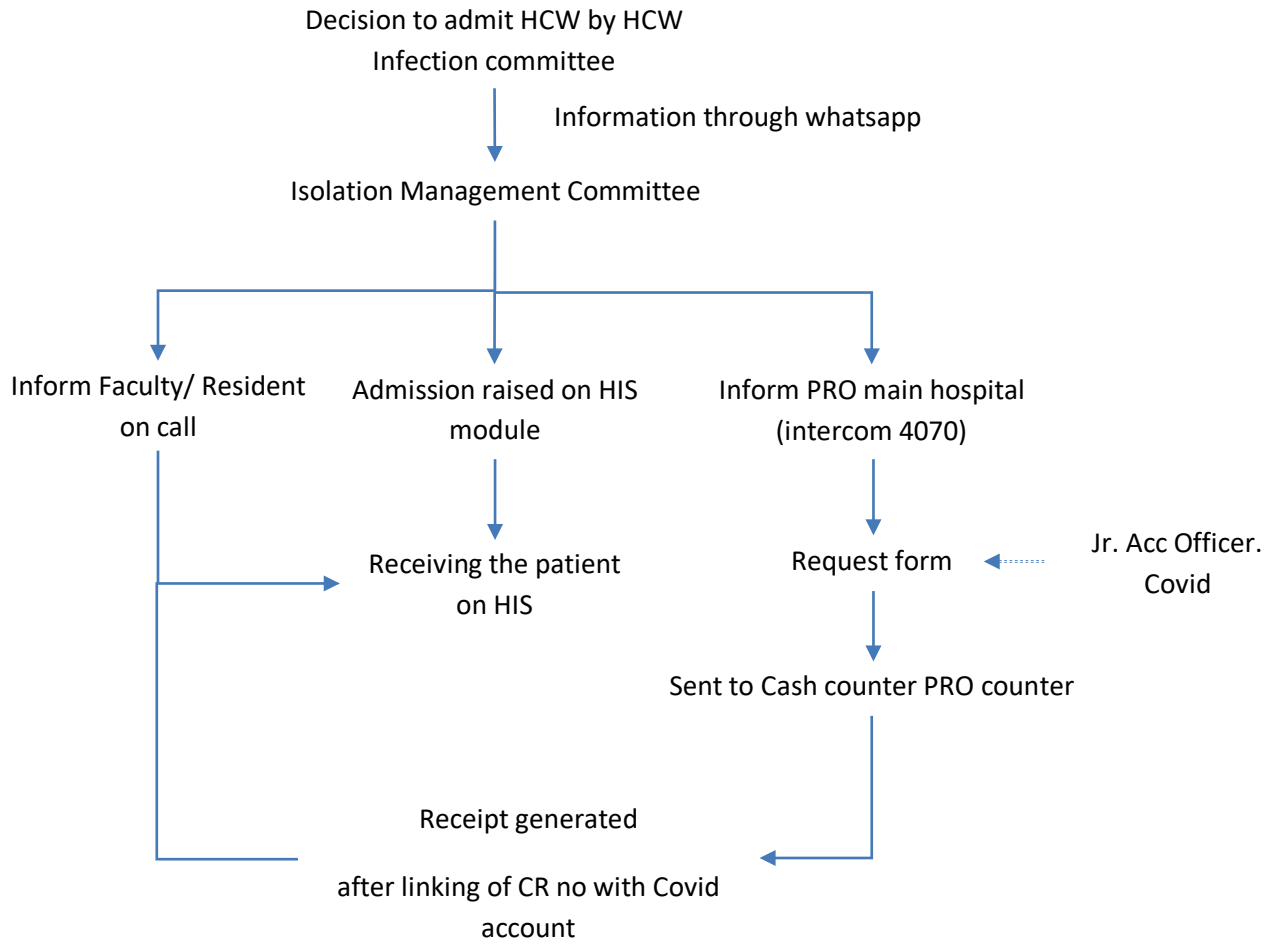
Format for admission of asymptomatic HCW in Isolation facility

Name of HCW	
Designation	
CR No	
Department	
Covid 19 +ve report date	
Asymptomatic	Yes No
Signature Chairman / nominee HCW Infection committee	

- Registration of HCW
    - HCWs who are covered under staff PED account may be admitted directory after raising the admission. Receipt to be generated by staff posted in cash counter. Receipt to be attached in patient file
    - Non staff patient: In case of contractual HCW who are not covered by staff PED account following steps need to be taken
        - Registration by respective establishment/ nodal officer as a Covid Patient at RCH.
        - As an alternative, registration of HCW to be admitted can be coordinated by Member of HCW I.C by sharing following information with on duty PRO in main hospital (extn no- 4070) for registration of HCW
            - Minimum information to be shared for registration= Name of HCW, Father's/ Husband's Name, Age, Address and contact no.
- Linking of non-staff HCW to Covid account:
    - After receiving information from HCW infection committee, Consultant on call / member from Isolation management committee to raise admission
    - Information about admission to be shared by Sister Incharge, with PRO on duty at Main Hospital PRO counter (landline no: 4070).
    - PRO shall fill the form as per RCH protocol (form to be provided by Mr Upendra Nath Srivastava, Jr. Acc. Officer, Covid) and provide the same to staff posted in cash counter.
    - Cash counter staff will link CR no with Covid PED account and will generate receipt to be attached in patient file.
    - HIS Management team (Mr Pradeep Kumar, CUG- 0614 or Mr V K Singh, CUG-9581 during daytime and Mr A K Sarkar, CUG-4478 during odd hours) to resolve any issues arising due to user login restrictions on HIS portal.

V. Discharge/ Transfer to RCH

- HCWs, if remain asymptomatic during admission, will be discharged after completion of isolation period as per Institute SOP (Annexure I) "Patient under home isolation will end home isolation after 17 days of onset of symptoms (or date of sampling, for pre-symptomatic cases) and no fever for 10 days. There is no need for testing after the home isolation period is over".
- HCWs if develop symptoms during admission, shall be transferred to RCH in consultation with RCH faculty, Member of HCW IC and Member of IMC.
- For transfer, request will be raised by Faculty/ resident on call by way of "cross consultation" for *Emergency* department under the patient care area on HIS in-patient module.



Procedure for admission of non-staff HCW

VI. Manpower management in Isolation facility

- One staff nurse, one sanitation/ housekeeping staff and one patient helper/ attendant will be posted round the clock for patient care activities in phase I of isolation for HCW.
- Roster of these staff shall be prepared by respective establishment / nodal officers

Staff category	Nodal officer	Contact No
Staff Nurse	Mrs. L.Kalib Solanki, CNO	0893 (CUG)
Patient Helper	Mr Nikhil Chandra, SAO	7735 (CUG)
Sanitation/ Housekeeping	Dr R Harsvardhan, N.O., BMW	9928 (CUG)
Security on Entry/ exit	Mr Bharat Singh, CAO	7734 (CUG)

- Duty rosters shall be distributed to all concerned officials including Nursing counter of Isolation for HCW.
- Nurse posted in Isolation for HCW shall be provided with HIS login for management of patients.
- Quarantine facility for staff posted inside Isolation facility to be provided by the quarantine committee as per the approved protocol of the institute.

VII. Clinical Management

- This facility shall function as a **surrogate home isolation facility**
- Any symptomatic patient or patient requiring clinical management more than home isolation protocol shall be shifted to RCH. In case of any difficulty final decision shall be made by Director/ CMS/ Chairman, HCW infection committee.
- The clinical management of admitted patients shall be in accordance with " Guidelines for Home Isolation of Pre-symptomatic Asymptomatic, Very Mild and Mild COVID-19 cases" **(Annexure- I)**and RCH protocol for management of patients admitted in isolation area **(Annexure-II)**
- Management protocol (including monitoring, treatment, testing etc) for admitted HCWs shall be same as per the protocol for isolation area in RCH. All treatment related logistics (equipment, drugs etc.) will be supervised and taken care of by Prof. R.K. Singh, Nodal Officer, RCH
- Consultants from General hospital shall be on call on weekly roster for clinical management of admitted Health care workers
- The resident from a particular department, who is on roster in holding area shall be on call duty of Isolation for HCW area on daily rotation basis.
- One member of the Isolation management committee shall be nominated by Nodal officer for coordination along with Consultant and resident on call on weekly basis.
- The resident will take two virtual rounds of the area using the phone (intercom no 4819) placed at the entry of isolation facility on daily basis and coordinate with Consultant on call for clinical management of admitted patients.
- Orientation of consultant on call and resident will be done by Faculty member from the Isolation management committee who will also provide them with HIS login details.
- Resident on duty as per roster will be provided with a resident login for management of patients in Isolation for HCW.
- Testing/investigation: will be raised / ordered/ decided by SR/ Consultant on call duty for testing in 24 Hrs Lab.
- Sampling for RT-PCR testing of habitants (if required), will be done by on-duty nurse.
- Following information shall be provided on duty roster of resident / faculty member.

- Clinical monitoring of habitants of the Isolation for HCW in accordance with institute RCH guidelines/ protocol
- To take two virtual rounds of the area using the telephone placed at the entry of Isolation area (Intercom nos of Isolation area Phase I: Nursing station= 4080, entry gate= 4819)
- Co-ordinate with Consultant on rotation duty for clinical management
- Incase of symptoms, co-ordinate with Nodal officer RCH/ Chairman HCW IC for transfer to RCH
- *Important phone nos:*
- Prof R K Singh, Nodal officer RCH- 8004904731 (CUG)
- Dr Alok Nath, Head Pulmonary Medicine- 8004904532 (CUG)
- Dr Dheeraj Khetan, Nodal Officer, Isolation Magmt Comm.- 8004904436 (CUG)

VIII. Patient Care

- Patient kits consisting of accessories for personal use will be provided to each patient after admission. Patient kits to be arranged by Dr R P Singh.
- One Thermometer along with disposable for wearing will be provided to each patient.
- Only one mobile phone with charger will be allowed.
- Minimum personal belongings to the patient will be encouraged
- Disinfection of any personal belonging at the time of discharge shall be the responsibility of the patient. Sanitizer solution / wipes shall be provided.
- Patient shall be responsible for self monitoring as per the provided format **(Annexure III)**
- Patient will have to give an undertaking of self isolation at the time of admission **(Annexure IV)**
- In case of any problem patient can contact on whatsapp to Nodal officer, Isolation management committee (8004904436)
- The above information related to patient care shall be shared with the patient at the time of admission

IX. HRF supplies

- HRF store of holding area shall be used for supply of items in isolation ward too.
- Ms Neelam Khokhar, DNS, In - charge of Isolation ward facility will be provided with HIS Login facility to raise request of items from HRF holding store for fulfilling the requirements of Isolation for HCW.

X. Kitchen / Food Policy:

- Food shall be provided from patient Kitchen of the Institute. The food will be served at a place of isolation ward, from where dedicated person of the isolation ward will serve the food inside.
- Food will be served in disposables and used disposables will be discarded as per protocol. The logistics of bins, etc will be met out from HRF. (action taken: Dr. R Harshvardhan)
- Supplier from kitchen will place the food in disposable serving at the entry of Isolation for HCW and press the doorbell. Patient helper/ attendant in the Isolation for HCW will receive the food and distribute to patients in the Isolation area. Same pattern as is being carried out in RCH shall be adopted.
- No supply of homemade food will be allowed

XI. Sanitation

- Sanitation, Cleaning, Disinfection and BMW activities in the facility round the clock as per protocol will be looked after by Dr R. Harsvardhan, Nodal Officer BMW.
- Biomedical waste shall be disposed off the Fire exit door of old OPD area opening towards plaza.
- Regular sanitization and disinfection of the entire corridors and wards shall be done in accordance with RCH protocol by Dr Richa Mishra, Microbiology Deptt.

- In unfortunate incidence of death of any patient, Dead Body Disposal would be performed as per already circulated guidelines. Dr R Harshvardhan would provide necessary support in this regard.

XII. Linen and personal wear for staff including PPE

- Linen etc requirement will be met out by CSSD
- Preferably disposable linen and personal wear will be used. Holding area HRF store will be used for providing these items.

Isolation for HCW: Treatment Protocol

- Contact and Droplet precautions
- Strict hand hygiene
- Tab Ivermectin (12 mg/day for 3 days, to be taken two hours after dinner) and Cap. Doxycycline (100 mg BD for 5 days)
    - Avoid Ivermectin in Pregnant women and children <2 years
    - Avoid Doxycycline in Pregnant women and children <12 years
- Alternate therapy -Tab. Hydroxychloroquine (400mg BD on 1st day followed by 200mg 1 BD for 4 days) and Tab Azithromycin (500 mg OD for five days). (ECG Assessment* to be done before initiating therapy)
- Tab Vit C (Limcee) 500mg 1 BD
- Tab Zincovit 50mg BD
- Paracetamol SOS
- Symptomatic treatment for cough and fever (bronchodilators, mucolytic, paracetamol)
- Monitor closely for warning signs
    - Chest pain, dyspnoea
    - Tachypnoea, cyanosis, altered mentation
- In case of persistent fever with either cough/ sore throat/ throat pain- discuss with Consultant on call to initiate
    - Favipiravir (1800 mg BD on Day 1 followed by 800 mg BD for days 2-14)

**ECG assessment*

- to be done by sharing the image of ECG through whatsapp with Faculty/ Resident on call duty.

Guidance for Preevntion and Management of COVID- 9 infection among HCW in Non COVID Health Care Facility

Background

There have been some instances of hospitals having closed down as few health care workers (HCW) working there turned out to be positive for COVID -19. This leads to undue apprehension among healthcare workers, sometimes leading to impaired functionality of such hospitals.

Although Ministry of Health & Family Welfare has issued comprehensive guidance to prevent occurrence of Hospital Acquired Infection (HAI) in health facilities, the practice of universal precautions might still be lacking in many of our hospitals. A COVID-19 case with mild/asymptomatic/atypical presentation may go undetected and inadvertently transmit the infection to other patients and healthcare workers, placing these individuals at risk of contracting disease and compromising the functionality of the healthcare facility.

Purpose of document

This document aims to provide guidance on (a) prevention of COVID infection among HCWs in a non-COVID health facility; and, (b) action to be taken on detection of confirmed COVID-19 infection in an HCW working in Non-COVID areas of our institute.

(A) Prevention of COVID infection in a non-COVID health facility

a. At the entrance of every ward as well as OT, a file will be maintained with an A4 size sheet that includes the names of every health care worker who is on duty in that particular ward. Every HCW, in every shift, entering the respective ward will have to sign a 'self-declaration' compliance (Annexure 01) sheet' that includes the following columns - (a) any history of fever, cough, chest pain, myalgia, expectoration; (b) any history of loss of smell and taste; (c) any contact with

COVID positive/suspected cases; and, (d) any history of travel or contact with a person with recent travel outside the city.

b. The sister-in-charge of each ward will appoint a nodal officer for all shifts in order to ensure that the compliance sheet is being signed and this data will be stored in the department after being ratified by particular in-charges on a daily basis.

c. In every ward, a section will be created which will be kept segregated and patient-free, so that in-case of exposure of COVID in one of those sections, the ward services will be shifted to the other section.

d. The HCWs of the wards will be regularly educated by faculty-in-charge on topics like wearing of masks, social distancing, frequent hand washes, wearing of shoe cover, and changing clothes or importance of bathing as soon as they reach home.

e. The persons on duty should not cluster together but remain in their respective areas in the wards so that they are all not exposed concurrently.

(B) Actions to be taken on detection of confirmed COVID HCWs:

A. Actions for HCWs:

a. The incident will be immediately reported to Healthcare Worker Infection Committee and the nodal officer COVID-19 of the institute.

b. The infected HCW will be immediately transferred to Rajdhani Covid Hospital Isolation Ward/Quarantine Area in a dedicated Ambulance as per the guidelines laid down by MoHFW.

c. Detailed contact tracing should be done from the time HCW had been symptomatic. The **risk of exposure** will be stratified according to table below:

	Duration > 15 min	**Distance < 1 meter**	**Patient without Mask**	**Person exposed Without Mask**
Name of contact	Yes/No	Yes/No	Yes/No	Yes/No

Note: Only contacts with all "Yes" in the above table will be considered as "high risk"

d. All HCWs who have come into contact with an infected person/patient without protection, within 1-meter distance from infected person, for more than 15-minutes, will be identified as **high-risk contacts (HRC)**. All the rest of the exposed individuals will be labeled as **low risk contacts (LRC).**

e. All HRCs will be immediately sent on home quarantine for 14 days if they have

appropriate facilities for the same at their home, otherwise they will be sent to the institutional quarantine facility. They will be given instructions for self-monitoring and protocols to be followed strictly during quarantine.

f. All HRCs will be tested for COVID-19 infection with RT-PCR day 1, 5 and 14 or anytime they become symptomatic during quarantine. However, for rapid diagnosis, TRUENAT will be used for D1 tests. For rest of the days i.e. 5 and 14, gold standard RT-PCR will be done. They will resume their routine if they are negative after completing 14 days of quarantine.
g. All LRCs will also be quarantined till the results of TRUENAT test done on **Day 1** of the high-risk contacts are available. They will be return back on duty if the Day 1 test results of HRCs are negative.
h. If any of the HRC turn out to be positive the above-mentioned protocol will also be applied to him.

B. Action for patients:

a. All the patients admitted in the healthcare facility who have been exposed to the infected HCW will again be categorized into HRC and LRC similar to that done for HCWs.
b. All patients will be transferred to the Holding Area immediately and HRC patients and LRC patients will be cohorted separately.
c. All HRCs will be quarantined in Holding Area for 14 days and closely observed for development of any symptoms. They will be tested on day 5 and 14 of the exposure or anytime if symptomatic. If after 5 days, they are negative and fit for discharge they will be discharged, and home quarantined for the remaining period.
d. LRC patients will be transferred back to the parent ward if HRC patients are tested negative.

C. Actions for the healthcare facility:

a. The ward in which HCW infection had occurred will be evacuated and sanitized thoroughly as per recommendations of MoHFW.
b. The healthcare facility may be reused after sanitization for LRC patients after results of HRC patients are available.

D. General precautions:

a. For all those HCWs who have come in contact with COVID 19 positive worker

and have been identified as HRCs, hydroxy chloroquine prophylaxis should be given under medical supervision.

b. Keeping in view the possibilities of COVID 19 infection in the institute strengthened staffing and contingency plan should be made according to which few HCWs should be kept in reserve or as backup so that functionality of any area does not get affected.
c. Only one attendant with photo identity gate pass should be allowed to stay with the patient as per need. The attendant should be taught all COVID standard precautions.
d. All the paramedical staff should be trained according to the IPC protocol and protocol for best management to fight COVID 19.
e. To prevent the spread of infection of COVID-19, proper logistics i.e PPE kits, hand sanitizer should be made available in adequate quantity.
f. The Chief Medical Superintendent should ensure that staff should confine to their workplace, and not roam around here and there during working hours and should not meet other staff and officers unnecessarily. To prevent the spread of covid-19, hand hygiene, respiratory etiquettes, wearing mask and maintaining social distancing is mandatory.
g. Patients admitted in wards should also wear masks, maintain physical distancing observe hand hygiene and maintain physical distancing.
h. Every patient admitted to the ward will first get a COVID testing (either in the holding area or ERS) and then shifted to the ward. This patient will be kept in an isolated area of ward until his/her second COVID test is negative.
i. The kitchen and CSSD workers will be given proper PPE and would also be tested prior to starting of their duties.
j. A random pool testing of all HCWs in a particular ward may also be carried out from time to time. This is particularly relevant to those HCWs whose home lies in the hot-spot zone of the city.
k. Health Care Infection Control Committee (HICC) should ensure the strict compliance of IPC protocol and should get the gap analysis done time to time. The feedback should be shared in weekly task Force Meeting and related lacunae should be taken care of.

ANNEXURE 01

Health Care Worker Self-Declaration Compliance Sheet Date:

Name	Duty shift	Fever	Cough	Breathlessness	History of contact with COVID patient	History of Travel	H/O of attending any ceremony or gathering	Signature

Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow

Instructions for Healthcare Workers Posted in Non Covid Area

Before coming to the hospital:

1. Self-evaluation is to be done before coming to the hospital. Assess yourself for fever, cough, body ache and breathlessness. Please check other symptoms like diarrhoea, weakness, or chest pain also.
2. If you have any of the above symptoms inform your HOD/Supervisor immediately.

On reaching Hospital:

1. On reaching hospital, the HODs/Supervisor will ensure your attendance and compliance sheet (Annexure 01)
2. Mask MUST be worn by all on duty.
3. Hand hygiene must be followed strictly. Wash your hands with soap at regular intervals or use sanitizers.
4. Maintain physical distancing with your colleagues at work.
5. While sneezing and coughing, respiratory etiquettes must be followed.
6. Immediately inform your in-charge if any symptoms develop during duty hours.
7. Tobacco chewing/smoking and spitting is strictly prohibited during duty hours.
8. Dispose-off your used masks at appropriate place.

After reaching home:

1. Keep your shoes / footwear outside.
2. Keep your belongings in a separate bag, which can be kept in a isolated place which cannot be used by other members of the family.
3. Take bath immediately after reaching home.
4. Follow hand hygiene, physical distancing and respiratory etiquette even at home with family members and neighbours.
5. If you move out of your house do wear a mask at all times.
6. Dispose-off your used masks at appropriate place.

संजय गांधी पोस्टग्रेजुएट इंस्टिट्यूट ऑफ मेडिकल साइंसेज, लखनऊ

नॉन कोविड क्षेत्र में कार्यरत स्वास्थ्य कर्मियों के लिए आवश्यक दिशानिर्देश

अस्पताल आने से पहले:

1. अपना मूल्यांकन स्वयं करें। तय करें कि आपको कहीं खांसी, बुखार, बदन दर्द, सांस लेने में तकलीफ तो नहीं है। अन्य लक्षण जैसे डायरिया सिर में दर्द मांसपेशियों की कमजोरी छाती में दर्द तो नहीं है।
2. अगर आपको उपरोक्त लक्षणो में से कोई भी लक्षण दिखाई पड़े तो तुरंत अपने विभागाध्यक्ष अथवा सुपरवाइजर को सूचित करें ।

अस्पताल पहुंचने पर:

3. सभी विभागाध्यक्ष अथवा सुपरवाइजर यह सुनिश्चित करेंगे कि प्रत्येक स्वास्थ्यकर्मी अस्पताल पहुंचने पर अनुपालन एवम उपस्थिति पंजिका पर हस्तकक्षकर करें और उनकी थर्मल स्क्रीनिंग भी की जाए ।
4. अपने कार्यस्थल पर ड्यूटी के समय अनिवार्यतः हमेशा मास्क पहने।
5. Hand hygiene का कड़ाई से पालन सुनिश्चित करें । थोड़ी थोड़ी देर में साबुन से हाथ धोये अथवा सैनिटाइजर से अपने हाथों को साफ करें।
6. ड्यूटी के समय सभी सहकर्मियों के साथ सोशल डिस्टेंसिंग का पालन करें।
7. खांसी और छीकते समय respiratory etiquette का इस्तेमाल करें। छीकते समय रुमाल का इस्तेमाल करें। यदि रुमाल नहीं है तो अपने हाथ के बाजू का इस्तेमाल करें।
8. किसी भी तरह के लक्षण आने पर तुरंत अपने इंचार्ज को सूचित करें।
9. संस्थान में तंबाकू/धूम्रपान/थूकना पूर्णतः वर्जित है ।
10. उपयोग किया हुआ मास्क का सावधानी से सही जगह निपटान करें ।

घर लौटने के बाद:

1. घर लौटने के बाद अस्पताल में इस्तेमाल किया गया सामान प्राथमिकता से बिल्कुल अलग रखें जिससे उसे घर का कोई भी सदस्य इस्तेमाल ना कर सके।
2. जूते घर के बाहर उतारे।
3. घर लौटने के बाद तुरंत स्नान करें।
4. घर पे भी शारीरिक दूरी, हैंड हाईजीन एवम रेस्पिरेटरी एटिकेट्स कंपालन करें एवम बाहर जाने पर हमेशा मास्क पहने ।
5. उपयोग किया हुआ मास्क का सावधानी से सही जगह निपटान करें ।

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Quarantine Policy for Health Care Workers (HCWs)

All HCWs should immediately report to the nodal officer, Covid Hospital, if he/she either develop any symptoms of COVID19 infection or have unprotected exposure (accidental) to a Covid positive case

Active quarantine

All the HCWs, during their duties, will stay in hospital designated accommodation and this will be considered as **"Active Quarantine".**

Passive quarantine

The quarantine, if required after completion of their duty period, will be called as **"Passive quarantine".**

Risk categories

All the HCWs will be categorized as 'High-Risk' or 'Low-Risk' category as defined below

High-risk category

1. HCWs involved in performance of aerosol generating procedures without appropriate PPE or breach in PPE such as:
    a. Endotracheal intubation or extubation
    b. Cardio-pulmonary resuscitation (CPR)
    c. Application of non-invasive ventilation (NIV) or open air-way suctioning
    d. Bronchoscopy or tracheostomy
    e. Nasopharyngeal swab or Sputum or Broncho-alveolar fluid specimen collection
    f. Any unprotected contact of more than 15 minutes and at a distance less than 2 meters from a suspected or confirmed case

2. Any unprotected exposure to suspected or confirmed case at a distance less than 2 meters

Recommendation

1. Passive quarantine (with in hospital premises or in a pre-designated area for quarantine) for 14 days.
2. Twice daily, self-monitoring for the fever, cough, breathing difficulty and other symptoms during the 14 days of quarantine period
3. All such HCWs will be tested on day 1, 5 and 14 or anytime they become symptomatic. If they are tested negative, they will resume their duties.
4. In an unfortunate event of testing positive, he/she shall be admitted to RCH if symptomatic and if asymptomatic, he/she will we admitted in the HCW Isolation facility.
5. Those who opt for home isolation will be allowed for home isolation as per state policy if facility for home isolation are available at his/her home and they fulfil criteria for home isolation.

Low risk category

All others will who are not high-risk contacts will be labelled as low risk contacts.

Recommendations

a) They will be eligible for active quarantine for the period of their duties i.e. 14 days\
b) Twice daily, self-monitoring for the fever, cough, breathing difficulty and other symptoms
c) RT-PCR at the end of duty period – If negative they will be given a break of 2 days after which they will resume their duties in Non COVID area.

Home quarantine (HCWs staying in his/her home): Home quarantine shall be preferred, if possible. During the home quarantine, following precautions shall be practiced.

a. The person shall have an uninterrupted 24 x 7 supply to food and water.
a) He/she shall have a room with separate toilet, i.e, The room, used by the HCW, shall not be shared by other members in the family
b) The HCW shall be able and agree to monitor for symptoms (fever, cough, breathing difficulty) twice daily
c) Discard all the disposable material in the hospital

d) Remove shoes and maximum possible cloths outside the house or in an isolated area at home
e) Keep bag packs and hospital stuff in a separate or dedicated area
f) Take bath immediately after entering the house
g) Change your remaining clothes and discard them in the laundry for **separate** cleaning
h) There shall be no sharing of utensil and linen between the quarantined HCW and other family members
i) Maintain the minimum distance of one meter (3 feets) from other family members
j) Maintain standard hygiene practices and respiratory etiquettes.
k) Stay away from children and elderly family members
l) If there are two stories in house, then preferably occupy the room in upper story

In-House quarantine (HCWs staying in hospital designated accommodation): If home quarantine is not feasible, then the HCWs can be quarantined in hospital designated accommodation.

References

a. Infection prevention and control during health care when COVID-19 is suspected; Interim Guidance by World Health Organization (WHO), dated 19th March 2020
b. Considerations for quarantine of individuals in the context of containment for Coronavirus disease (COVID-19); Interim Guidance by World Health Organization (WHO), dated 19th March 2020
c. Risk assessment and management of exposure of health care workers in the context of COVID- 19; Interim Guidance by World Health Organization (WHO), dated 19th March 2020
d. Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease (COVID-19); Center for Disease Control and Prevention, USA, dated 7th March 2020 (accessed from https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesmenthcp. html on 2nd April 2020)
e. Guidelines for Quarantine facilities COVID-19; National Center for Disease Control (NCDC), MoHFW, New Delhi
f. COVID-19: Guidelines for Setting up Isolation Facility/Ward; National Center for Disease Control (NCDC), MoHFW, New Delhi

g. COVID-19: The updated case definitions and contact-categorisation; National Center for Disease Control (NCDC), MoHFW, New Delhi

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STANDARD OPERATING PRTOCOL FOR DEAD BODY DISPOSAL

Instructions for Supervising Staff/Housekeeping Staff during removal & handling of Dead Body from the isolation room or any clinical area

- Time Period to carry out the procedure will range from 5 min upto 30 min
- The health worker attending to the dead body has to perform hand hygiene, ensure proper use of PPE (water resistant apron, goggles, N95 mask, gloves)
- All tubes, drains and catheters on the dead body has to be removed
- Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) has to be disinfected with 1% hypochlorite and dressed with impermeable material
- Apply caution while handling sharps such as intravenous catheters and other sharp devices. They have to be disposed into a sharp's container
- Plug Oral, nasal orifices of the dead body to prevent leakage of body fluids
- Place the dead body in leak-proof plastic body bag. The exterior of each body bag has to be decontaminated with 1% hypochlorite. This process has to be repeated three times so as to ensure packing of dead body in tripled layered leak-proof plastic body bag. The body bag can be wrapped with a mortuary sheet or sheet provided by the family members
- All used/ soiled linen has to be handled with standard precautions, put in biohazard bag and the outer surface of the bag disinfected with hypochlorite solution
- All Bio-medical waste must be handled and disposed of in accordance with Biomedical waste management rules
- The health Care Worker who handled the body will remove personal protective equipment and will have to perform hand hygiene once the dead body is handed over to Rapid Response Team, RCH or other team as Main Hospital, SGPGIMS
- Provide counselling to the family members and respect their sentiments

- If the family of the patient wishes to view the body at the time of removal from the isolation room or area, they may be allowed to do so while maintaining Standard Precautions

- All surfaces of the isolation area, ICU/ ERS/ any clinical area (floors, bed, railings, side tables, IV stand, etc.) has to be disinfected with 1% Sodium Hypochlorite solution

Instructions to Staff during Transportation & at Crematorium/ Burial Ground for COVID-19 Positive/Suspected cases

- Dedicated Hearse Van has to be used to transport of COVID-19 positive/suspected case

- The personnel handling the body has to follow standard precautions and use of PPE (water resistant apron, goggles, N95 mask, gloves)

- Presence of Medical Personnel is mandatory in the time of transporting Body to the Hearse Van

- With Hearse Van, one driver, one Police Personnel and one Personnel authorized by the institute must be present

- All staff identified to transport and handle dead body has to be readily available

- The vehicle must be disinfected with 1% Hypochlorite solution, once the body is handed over to the Crematorium/ Burial Ground, and the vehicle returns back to SGPGIMS

Instructions for Public Relation Officers (PROs) in COVID-19 Dead Body Management

- In case of Death of any COVID-19 positive/ suspected patient in Rajdhani Corona Hospital (RCH), the P.R.O. on duty must inform immediately to the respective District Officer, Chief Medical Officer and District Surveillance Officer via Written, Telephonic , Whatsapp and any other mode of communication as required

- P.R.O. has to provide a handout to Patient's Attendant in the presence of Police Personnel, of Instruction for Patient Attendant for Dead Body Management as per the government guidelines

- P.R.O. has to provide a handout of Patient Information to Police Personnel, also

- P.R.O. has to inform about the Death of any COVID-19 positive/ suspected patient to Central Control Room (RCH)

- P.R.O. Supervisor must provide duty roster of all P.R.Os on duty at RCH with their name and mobile No. respectively to Central Control Room (RCH)

- It is mandatory for all P.R.O.s on duty to undergo training in respect to COVID-19 Infection control and prevention practices and Dead Body Management as and when informed by Deptt. of Hospital Administration

Instructions for Patient Attendant during Transportation & at Crematorium/ Burial Ground for COVID-19 Positive/suspected case

- It is to inform all that COVID 19 does not pose additional risk if proper standard precautions are followed

- Standard precautions of hand hygiene, use of full PPE should be used by Patient Attendant/the person performing last rites for the cremation of Patient dead body

- Religious rituals such as reading from religious scripts, sprinkling holy water and any other last rites that does not require touching of the body can be allowed

- Bathing, kissing, hugging, etc. of the dead body is not allowed

- The funeral/ burial staff and family members must perform hand hygiene after cremation/ burial

- The ash does not pose any risk and can be collected to perform the last rites

- Large gathering at the crematorium/ burial ground must be avoided as a social distancing measure

- The vehicle must be disinfected with 1% Hypochlorite solution, once the body is handed over to the Crematorium/ burial Ground, and the vehicle returns back to SGPGIMS

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SOP for management in zero area of Rajdhani COVID Hospital

This document provides recommendations for infection prevention and control during registration process in managing patients with suspected or confirmed COVID-19 in the institute. These guidelines aim to prevent transmission of COVID-19 infection in the institute through the implementation of appropriate infection prevention and control measures.

1. Following healthcare personnel will be present in the zero area:
    a. PRO (MSW) 2 per shift 2 x3 = 6
    b. MSSO 1 per shift 1 x 3 = 3
    c. DEO 1 per shift 1x 3 = 3
    d. Attendant 1 x 3
2. MSW, MSSO and DEO will enter the hospital from designated entrance area and get ho there designated and remain stationed there.
3. Attendant will also be stationed at zero area.
4. All health care personnel except the attendant will wear surgical TLM while on duty. No other protective gear is required for them.
5. Attendant will be wearing surgical gown, N-95 mask and surgical cap while on duty.
6. He may be required for patient movement from isolation wards or ICU.
7. No patient relatives or attendants will be allowed in zero area. Registration will be done through emergency department who will send digital images of registration forms filled in by the patient relative in emergency department.
8. Once registration is done CR. No. will be communicated to staff in emergency and file will be prepared there. Therefore, no movement of healthcare personnel or patient relative will be required for registration process.
9. If patient form emergency is required to be shifted to ward or ICU the attendant of emergency department will escort him.
10. The attendant from zero area will only be responsible for movement from ward areas.

11. Daily requirement of protective gear will be calculated and supplied from HRF on weekly basis.
12. MSW will keep record of all the protective gear and provide it to the HRF for reissuing of material on weekly basis.

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STANDARD OPERATING PROCEDURE FOR TRANSFERRING-OUT PATIENTS FROM RAJDHANI CORONA HOSPITAL

Several patients admitted to Rajdhani Corona Hospital (RCH) SGPGIMS need further evaluation and management for their comorbidities or sequelae of COVID-19 after getting tested negative for COVID.

This document aims to provide guidelines for uneventful and safe transfer of such patients to their destination ward/ICU for to the destination ward/ICU.

1. All patients who are admitted to RCH and subsequently tested negative for COVID-19 but require further evaluation and management for their comorbidities or sequelae of COVID-19 should be considered for transfer to the destination department.
2. The faculty In-charge of the particular area where the patient is admitted, should ensure that the patient is stable enough to be transferred from RCH to SGPGI main hospital.
3. At least **TWO NEGATIVE RT-PCR** tests should be obtained 48 hours apart before contemplating transfer.
4. A detailed summary of the patient should be provided to the destination department and case should discussed by the faculty In-charge of the patient with faculty In-chrge of destination department.
5. Once the patient ids deemed fit for transfer, he/she will be first transferred to Holding Area with proper coordination with resident/faculty of the department and In-charge of Holding Area. The Sister In-charge should also be informed about the transfer process.
6. The faculty In-charge of the patient will coordinate with PRO at RCH for arranging transport of the patient.
7. The PRO at RCH will arrange the ambulance for transfer and inform the resident/faculty of destination area at the time of exit.

8. **Senior Resident of the destination ward should be ready with PPE donned at the Holding Area** to receive the patient.
9. Once the patient is received at Holding Area the clothes of the patient will be changed and terminal cleaning will be done to minimize fomite borne transmission of infection.
10. Subsequently patient will be transferred to destination department under full supervision.
11. If the patient is relatively unstable and needs intensive care and multispecialty involvement, he/she should be considered for transfer to Department of Critical Care Medicine. In that scenario the case should be discussed with HOD CCM and patient may be transferred to CCM subject to availability of beds.

Neonatal Covid Management Protocol

Index

Introduction

- Background
- Case definition
- Transmission routes
- General Precautions
- Protection of health care workers
- Preparation
- Disinfection Policy

Background

COVID 19, the disease caused by novel corona virus SARS CoV -2 has led to an unparalleled global contagion involving more than 200 countries and still spreading rapidly. The virus seems to affect people of all age groups though severity varies. Elderly persons and those with risk factors seem to have severe disease. This novel corona virus may cause clinical conditions ranging from asymptomatic viral shedding, to mild illness resembling the common cold, to severe influenza-like illness and viral pneumonia. Data is limited for pregnant women and neonates for COVID 19 disease. Though less common, the infection does affect children with propensity for more severe infection in infants less than 1 year of age. Pediatric data from China report that among 86/731 (11.8%) confirmed cases occurring among infants less than 1 year of age, 21/86 (24%) of those infants suffered severe or critical illness (1). No deaths were reported among these infants. Case reports document COVID-19 in children as young as 2 days of age infants with variable severity (2- 4). India has recently started reporting cases in pregnant mothers and infants with youngest case occurring in a 3 day old neonate from Mumbai. This document will guide all pediatricians dealing with management of neonates affected or likely to be affected with this infection. The manuscript describes in brief general introduction, delivery room management and postnatal management of neonates born to mother with COVID 19 infection.

Case Definition

Suspected COVID 19 mother

Symptomatic mother in perinatal period with history of travel to affected countries or affected
states / places in India or history of contact with persons travelled to affected countries or affected states / places in India during last 14 days prior to onset of symptoms.

OR

Symptomatic antenatal mother when no other etiology explains her clinical presentation.

OR

A health care working antenatal mother who came in contact with confirmed COVID 19 case in last 14 days prior to onset of symptoms.

Confirmed COVID 19 mother

Mother with positive RT-PCR for COVID 19, irrespective of clinical signs and symptoms.

Suspected COVID 19 Neonate

A neonate born to mother with history of COVID 19 infection between 14 days before delivery to 28 days after delivery, or the newborn directly exposed to those infected with COVID 19 (including members, caregivers, medical staff and visitors).

Confirmed COVID 19 Neonate

Diagnosis of COVID 19 infection can be confirmed if one of the following criteria is met.

1. Respiratory tract or blood specimens tested by RT-PCR are positive for COVID 19 nucleic acid.
2. Virus gene sequencing of the respiratory tract or blood specimens is highly homologous to that of the known COVID 19 specimens.

Transmission route

- Viral transmission is mainly via droplets and touch/ fomites
- Air borne spread through aerosol generation
- Possible fecal-oral transmission
- Vertical transmission- unproven but cannot be ruled out.
- Breast milk – unlikely, needs to be proven.

General Precautions

- Maternal contact / travel history/ details of ANC/spouse or relative`s travel details must

be routinely asked and documented in every case.

- Social distancing (minimum 1m) - during postnatal rounds from bystanders/ mother, while communicating with mother and examining the baby; also, between the team members (doctors/ nurses/ support staff etc) during rounds at any patient care area.
- A triple layer face mask - routine use during rounds /OPDs/ counselling/ interaction.
- 100% Hand hygiene compliance, use non-dominant hand/ elbow/push by legs for opening doors
- Parent counselling area should be outside NICU
- Periodic disinfection of all the door handles (every 2-4 hourly) during working hours
- Xray film cassette in a dedicated cover, while inside NICU
- Restrict the bystander number to one or none with the mother during rounds. Use elbow as barrier when suddenly sneezes or coughs.

Protection of health care workers

- Respiratory protection: Triple layered surgical mask N95 face masks to be used while performing an aerosol generating procedure or in an area where neonates are being provided respiratory support by CPAP device/ ventilator, during resuscitation (including at delivery), during chest physiotherapy and suctioning.
- Consider covering the head of neonate with simple head box with closed openings while baby is on non-invasive ventilation in order to prevent spread of aerosols to surroundings.
- Use of closed in line suction catheters for suctioning endotracheal tubes should be preferred, if available.
- Eye protection: Goggles or face shield.
- Body protection: long-sleeved water-resistant gown.
- Hand protection: Gloves.
- Feet protection: Shoe cover extending upto lower legs.
- Donning & Doffing areas - to be ear marked near labour room/ OT/isolation NICU.
- Donning & Doffing training as per guidelines for staff managing COVID 19 patients.

Preparation

- Separate rooms for suspected and confirmed cases.
- If single room, minimum 1 m distance between the cohorts preferably divided by a water- resistant curtain in between 2 beds.
- Isolation rooms with negative pressure ventilation for patients requiring aerosolisation procedures (respiratory support, suction, nebulisation).

- Suspected or confirmed neonates to be placed in an incubator or may be in open care covered with cling wrap.
- Diagnosis and treatment items (stethoscope, thermometer, etc.) and nursing facilities should be individualized, and items disinfected every 2-4 hourly.

Disinfection Policy

- If the equipment if visibly soiled - clean with soap and water solution or soaked cloth as appropriate, bbefore applying the disinfectant.
- 0.5% sodium hypochlorite (equivalent to 5000 ppm) - to disinfect large surfaces like floors and walls at least once per shift and for cleaning after a patient is transferred out of the area.
- 70% ethyl alcohol - to disinfect small areas between uses, such as reusable dedicated equipment.
- Hydrogen peroxide (dilute 100 ml of H_2O_2 10% v/v solution with 900 ml of distilled water) - for surface cleaning of incubators, open care systems, infusion pumps, weighing scales, standby equipments, ventilators, monitors, phototherapy units, and shelves. Use H_2O_2 only when equipment is not being used for the patient. Contact period of 1 hour is needed for efficacy of H_2O_2.

Delivery Room Neonatal Management of Suspected/Confirmed COVID-19 Mother

- Area Identification
- Human resource
- Equipment
- Resuscitation
- Transport of neonate

Area Identification

- Ideally, resuscitation should be done in a separate adjacent negative pressure air borne isolation room to ensure minimum possible exposure. If negative pressure air borne isolation room is not available, two exhaust fans can be installed.
- If not feasible, the resuscitation warmer should be physically separated from the mother's delivery area by a distance of atleast 2 meters and preferably kept towards foot end. A sterile water-resistant curtain can be used between the two areas to minimize exposure.
- Identify areas for Donning and Doffing of Personal Protective Equipment (Gown, glove, goggles/face shield, and N95 face mask) by healthcare personnel.
- Mother should perform hand hygiene and wear triple layer mask.

Human Resource

- Skilled neonatal team members.
- Wear a full set of personal protective equipment including N95 mask.
- Minimum number of personnel should attend (one person in low risk cases and two in high risk cases where extensive resuscitation may be anticipated).
- Practice universal standard contact/ droplet precautions.
- Keep ready one person outside the room in case need arise.

Equipment

- All equipment as per NRP 2015 guidelines.
- Use minimum possible equipment and consumables.
- Use a separate radiant warmer and keep ready a set of other equipment that is required for resuscitation.
- Self- inflating bag and mask (avoid T piece resuscitation) with an attached viral filter, if available.
- Use of disposable Ambu bag and laryngoscope blade depending on availability.
- Use of video laryngoscope is preferred. If not available, then intubate in a maximum upright position and maintaining maximum possible distance.
- Disinfection of non-disposable items before and after every use or minimum once a day.
- All equipment to be discarded as per biomedical waste management guidelines.
- Used laryngoscope to be treated as high-risk equipment and properly disinfected.

Resuscitation

- Follow NRP 2015 guidelines.
- Immediate cord clamping.
- No skin to skin contact.
- Routine care and shift out of OT/ DR as soon as possible.
- If required, provide PPV using self-inflating bag and mask and use viral filter, if available.
- Intubation to be attempted standing upright as much as possible.
- Avoid providing CPAP using T piece resuscitator due to risk of aerosol generation.
- Use of polythene bag to cover neonate may be considered.

Transport

- Shift to designated area using closed transport incubator.
- If not available, use open care system with cling wraps cover.
- Person responsible for transport must use PPE.
- Transport equipment to be disinfected promptly.

Postnatal Management of Stable Neonates of Suspected COVID 19 Mother

- Area Identification
- Feeding
- Testing for virus
- Neonatal examination
- Discharge of neonate

Area Identification

- Isolate the mother from the baby immediately after birth in a separate isolation room.
- During isolation, healthy neonates should preferably be cared for by family member not in contact with mother or other suspected/proven case.
- Mother can express milk after washing hands and breasts and while wearing mask. This expressed milk can be fed to her own baby after boiling or pasteurization.
- Mother and baby can be roomed-in once mother has been tested and declared to be clear of infection.
- To facilitate early rooming-in, viral testing in mothers with suspected infection should be conducted and reported on priority.
- If resources for isolation are not available, healthy neonate may be roomed-in with mother. Mother must follow strict hand hygiene and wear a face mask and a separate gown while direct caring for newborn. The mother-baby dyad must be isolated from other suspected and infected cases and healthy uninfected mothers and neonates.
- Aim for 2-meter separation or a curtain when mother not directly caring for the baby.

Feeding

- Mother can express milk in a steel container with lid, after washing hands and breasts and while wearing mask. This expressed milk can be fed to her own baby after boiling.
- Mother may directly do breast feeding after hand and breast hygiene, with mother wearing a separate gown and triple layered mask, along with baby has been covered by a separate cloth, earmarked for feeding the baby to prevent virus coming from mother's airway down to the breast-feeding baby.

- Boiled or pasteurized donor milk from non-infected lactating mother may be used, in case mother's own milk is not available.
- Formula milk may be used if mother`s own milk and donor milk is not available.

Testing for virus

- No routine swabs taken from the neonate.
- Neonates born to mothers with COVID-19 infection within 14 days prior to delivery or up to 28 days after birth.
- Testing for symptomatic neonates exposed to close contacts with COVID-19 infection.
- If asymptomatic and roomed-in, test only if and when mother's test comes positive.
- Newborn to be tested 24 hrs after birth for first test.
- If mother is COVID-19 positive and baby's initial sample is negative, another sample should be repeated after 48 hrs.
- Preferred sample for testing is nasopharyngeal swab. Other sites may be oropharyngeal /rectal swabs.

Neonatal examination

- Routine physical examination using PPE and mask.
- Training of caregivers in newborn day to day care, feeding and in identifying dangers signs.
- Monitor and watch for symptoms, vitals monitoring (Temp, HR, RR, SpO2, color) every 6 hourly and SOS by nurse.
- Newborn screening for thyroid and heart disease should be done within 72 hrs.
- Other metabolic screening, hearing and visual screening may be postponed till baby turns out to be negative for COVID 19.

Discharge

- If not roomed in and stable, discharge early by 24-48 hours and to be cared by a COVID 19 negative relative/caregiver.
- Routine vaccination (BCG/ Hep B / OPV) prior to discharge on identified days.
- Stable neonates exposed to COVID19 and being roomed in with their mothers may be

discharged at time of mothers' discharge.

- Early discharge to home may be followed by a telephonic/tele-medicine follow-up or home visit by a designated nurse.
- Mothers and family members should be counseled regarding the danger signs and advised to report back to the facility if the neonate develops any of the danger signs.
- Information brochure with contact number to be given at discharge.
- **Nutraceuticals supplementation as below-**
  - Vitamin C 40 mg OD
  - Drops Vitamin D3 (1ml=400 IU) 1 ml OD.
  - Drops A to Z 0.5 ml BD
  - Omega3 fatty acids 500mg OD

Postnatal Management of Stable Neonates of Confirmed COVID 19 Mother

- Care area
- Breastfeeding
- Testing for virus
- Neonatal examination
- Discharge Care Area

Scenario 2

- If isolation is possible, isolate the neonate from the mother immediately after the delivery.
- One caregiver who is not COVID 19 positive, has not had a contact with a suspected or confirmed COVID 19 positive case and has no symptoms is allowed in the room for taking care of the newborn.
- Once the mother clinical condition is stable and has been documented RT-PCR negative the mother and baby can be roomed in.

Scenario 2

- If isolation is not possible, keep neonate roomed in with the mother but the dyad should be isolated from other mother baby dyads either in separate rooms or at atleast 2 m distance separated by a curtain.
- Proper hand hygiene, breast hygiene and PPE's must be done by the mother to prevent any risk of post-natal transmission.
- One caregiver, who is not COVID 19 positive case, had no contact with the mother or any other COVID 19 positive case can be allowed in the isolation room for taking care of the neonate with proper PPE's and hand hygiene.

Breastfeeding

- If the neonate is isolated from the mother expressed mother`s own milk which is boiled can be given.
- Expression of breast milk should be done after proper hand hygiene and breast hygiene in a steel container with lid.
- Feeding can be done by spoon or paladai by the caregiver.

- Mother to practice proper hand hygiene, breast hygiene and wear a triple layer mask and disposable gown while breastfeeding & use a thin cotton cloth cover for the baby, to be used exclusively while breast feeding.

- Breastfeeding without PPE can be resumed once the mother is diagnosed RT-PCR negative at 2 occasions 24 hours apart or if the neonate also tests positive.

- **Nutraceuticals supplementation as below-**

  - Vitamin C 40 mg OD
  - Drops Vitamin D3 (1ml=400 IU) 1 ml OD.
  - Drops A to Z 0.5 ml BD
  - Omega3 fatty acids 500mg OD

Testing for virus

- Site- swab from nasopharynx, oropharynx and rectum.

- Time-24 hours after birth and if negative a repeat sampling after 48 hrs .

- Method-insert a swab with a plastic stick into the nostril parallel to the palate. Swab should reach depth equal to distance of nostril to the outer opening of the ear. Leave swab in place for 60 seconds to absorb secretions. Slowly remove swab while rotating it. Place swabs immediately in viral transport medium. Person taking sample should wear PPE and follow protocol.

Neonatal Examination

- Routine physical examination to be done at the time of admission, daily rounds and discharge. Detailed examination on day one of life & at discharge.

- Proper hand hygiene, N95 face mask and PPE to be used while examining the baby every time.

- Daily monitoring of vitals to be done 6 hourly with special attention to any development of new symptoms.

- Metabolic screening, hearing screening can be postponed till neonate is negative for COVID 19.

- If the neonate becomes COVID-19 positive manage as per confirmed COVID-19 neonate case guideline.

Discharge

- If mother and baby positive for COVID-19 but asymptomatic, advise early discharge with strict quarantine and monitoring at home if possible.
- If the baby was isolated from mother at birth and test negative for 2 nasopharyngeal swabs 24 hours apart, baby can be discharged home with a healthy caregiver.
- If the baby was not isolated at birth and has 2 RT-PCR 24 hours apart documented to be negative, keep the baby with the mother with continued droplet and contact precautions until she becomes afebrile with improvement in clinical signs and symptoms and test negative for COVID-19 RT PCR at 2 occasions 24 hours apart.
- Routine vaccination (BCG/ Hep B /OPV) prior to discharge on identified days if baby is negative for COVID 19.
- The neonate may be followed by a telephonic/tele-medicine follow-up.
- Mothers and family members should be counseled regarding the danger signs and advised to report back to the facility if the neonate develops any of the danger signs.
- Information brochure with contact number to be given at discharge.

Postnatal Management of Sick Neonates of Suspected/Confirmed COVID 19 Mother

- Transport
- Care Area
- Team members
- Testing for virus
- Respiratory management
- Supportive care
- Specific management
- Feeding
- Discharge

Transport

- Transport the baby to designated area in a closed transport incubator.
- If incubator facility not available an open care system with cling wrap cover can be used.
- Use a pulse oximeter to monitor neonate during transport.
- Transport team should be wearing recommended PPE.

Care Area

- Sick neonates should be preferably managed in separate negative airborne isolation rooms. If not available negative pressure could also be created by 2-4 exhaust fans driving air outside rooms.
- Suspected and confirmed COVID-19 case should be managed in separate isolation rooms.
- Separate ventilator/ CPAP machines/ other equipments must be ear marked and kept ready all the times.
- If there is no separate isolation facility for suspected and confirmed COVID 19 cases, they should be segregated by leaving enough spaces (atleast 2 m) between two cohorts. Insert a water non-permissible partition between two babies.
- Isolation rooms should have adequate ventilation. If room is air condition it must have 12 air changes/ hour and filtering of exhaust air.
- These areas should not be a part of the central air conditioning system.

Team members

- The doctor/ staff working in these isolation rooms should be separate from those working in regular NICU
- Staff should have easy access of PPE and follow contact and droplet precautions at all time while caring for sick neonate.
- Staff should also be trained in donning and doffing.
- Staff should be quarantined after duty as per COVID 19 guidelines of Institute.

Testing for virus

- Time- Immediately. Repeat test after 48 hrs, if initial sample was negative.
- Site - Nasopharyngeal, oropharyngeal swab (if intubated tracheal aspirate may be taken) and rectal swab.
- CBC, Blood culture, Electrolytes, LFT and RFT can be done as and when required and handled with all biohazard precautions and safety.

Respiratory management

- Respiratory support for neonates with suspected/proven COVID 19 infection is guided by principles of lung protective strategy including use of non-invasive ventilation.
- Nebulization and HHHFNC should be avoided due to high risk of aerosol generation.
- Supplemental low flow O_2, CPAP, NIPPV and invasive ventilation as per existing policy for respiratory support with customized infection prevention strategy.
- A headbox with all closed ports except one for tubing of circuit can be used to cover the head of neonate receiving any form of non-invasive ventilation to prevent spread of aerosol (Fig.1)
- Competent staff should only undertake intubation. Use of video laryngoscope is preferred. If not available, then intubate in a maximum upright position and maintaining maximum possible distance. Use disposable laryngoscope blades if available.
- Closed in-line suction catheter for suctioning endotracheal tube should be used when

possible.

Figure 1. Headbox covering the head of baby in order to prevent environmental contamination by aerosol. The ports are covered with the help of cling wrap.

Supportive care

- Closed incubators are preferred whenever feasible.
- General supportive care includes fluid and electrolyte management, shock management and use of antibiotics as per the unit policy, when required.
- Remember to investigate for non COVID pathogen also.
- Diapers should be discarded in separate bin which is disposed as per biohazard waste management.

Specific Medications

- Antivirals or chloroquine/ hydroxychloroquine are not recommended for symptomatic neonate with suspected /confirmed COVID 19 infection.
- Use of adjunctive therapy such as systemic corticosteroids and IVIG is not recommended in symptomatic infants with confirmed/ suspected case of COVID 19.
- Use of oseltamavir may be considered in selective cases.
- Use of micronutrients such as Zinc and vitamin A, C, D etc having immunomodulation effect should be given in RDA.
- Use of Omega 3 fatty acid supplementation/ PUFA.
- Other immunity enhancing agents like honey, turmeric etc, may be considered after due deliberation.

Feeding

- Boiled or pasteurized expressed breast milk (EBM) from mother via feeding tube in sick neonates as and when baby's general condition permits.
- EBM by cup/ paladai/ syringe feed once neonate becomes stable under strict aseptic precaution by the caregiver. The caregiver must wear PPE when caring for neonate.
- **Nutraceuticals supplementation as below-**
  - Vitamin C 40 mg OD
  - Drops Vitamin D3 (1ml=400 IU) 1 ml OD.
  - Drops A to Z 0.5 ml BD
  - Omega3 fatty acids 500mg OD

Transfer and discharge

- Transfer of neonates from isolation can be done, once symptoms are resolved and baby tested negative twice 24 hrs apart.
- If mother is still sick, discharge to a healthy care giver can be done when baby is tested twice negative 24 hrs apart.
- Routine vaccination (BCG/ Hep B / OPV) prior to discharge on identified days (Monday/ Thursday) once baby is negative and fit for discharge.
- These babies may be followed up atleast for 1 year since the long-term outcome of this infection is till unclear.

Counseling of Caregivers

- Counseling should be in written document format.
- Parents / caregivers should be counseled daily telephonically or use telemedicine platform for counseling. If not available then, counsel a healthy caregiver in a separate room away from NICU. The distance between doctors and caregivers should be atleast 1 m. Both parties should be wearing atleast basic face masks. The room and surfaces should be disinfected promptly once counseling is done.
- If opportunity for antenatal counseling is available, then parents should be preemptively counseled about plan of action including general care, feeding, testing,

isolation, prognosis and finances (as per hospital policy).

- Options should be discussed about where and by whom the baby will be cared. Pros and cons of both the options whether by healthy caregiver or by mother /father should be discussed and a decision should be arrived upon.

- Caregiver should be using strict contact and droplet precautions while caring for babies who are stable. They should wear personal protective equipment including mask, gloves and gown and wash their hands frequently. The baby should be kept on a separate bassinet or bed atleast 1 m from caregiver`s bed while baby is sleeping. Caregiver should be trained in basic monitoring of baby and identification of danger signs.

- Parents/caregiver should be counseled regarding feeding of newborn. Pros and cons each choice of feeding whether breast feeding/formula /pasteurized mother`s own milk or donor milk. A collective decision should be reached upon after discussion with parents or caregivers. Precautions to be taken by mother or caregiver during feeding as described in previous sections should be explained in detail.

- Contact precautions with use of gloves should be taken while changing the soiled diapers. The diapers should be discarded as biohazard.

- Bathing can be done as for normal neonate. Clothes should be washed in detergent and hot water and dried completely before use.

- Importance of nutraceuticals to be emphasized to the caregivers.

- Baby should be roomed in with mother once she is negative for COVID 19.They should be counseled about prognosis that most babies with mild symptoms will come out of this infection; however, one should customize according to severity of condition of the affected baby.

Contact information

- SGPGIMS hospital reception: 0522-2494070, 2494071
- Extension Neonatology OPD: 5650
- Extension NICU: 5267
- www.sgpgims.in/www.sgpgi.ac.in
- email-neonatologysgpgi@gmail.com

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13. https://www.covid19sgpgi.com/

Consent form

Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow

Department of Neonatology

NAME	
CR No.	
Date of admission	
Phone	
Address	
Email id	

SELF DECLARATION BY PARENTS / ATTENDANTS

Do you have	Yes	No
Fever		
Cough		
Pain in throat		
Body pain / Fatigue		
Travelled internationally in last 14 days		
Travelled within India in last 14 days		
Any family member COVID + or in quarantine		

CONSENT FOR UNDERGOING TREATMENT DURING COVID-19 PANDEMIC

I/We .....knowingly consent to get treatment for my baby during COVID 19 pandemic in SGPGIMS.

I/We have been explained that COVID 19 is a highly communicable disease and the risks associated with the spread of it.

I/we have also been informed about the precautions being taken by the hospital in the prevention of transmission of infection among patients and staff and I give my consent to comply with those norms.

To the best of my knowledge I/we are free from the above-mentioned symptoms but during the course of hospital stay if the baby, parents or close relatives may show symptoms or become COVID 19 positive. In that case, everyone mentioned above will be tested/quarantined as per government guidelines.

I/We understand and acknowledge that even after all proper precautions, no assurance can be guaranteed regarding disease transmission to the patient or clinical outcome in case the baby gets infected with the corona virus.

Parent's signature

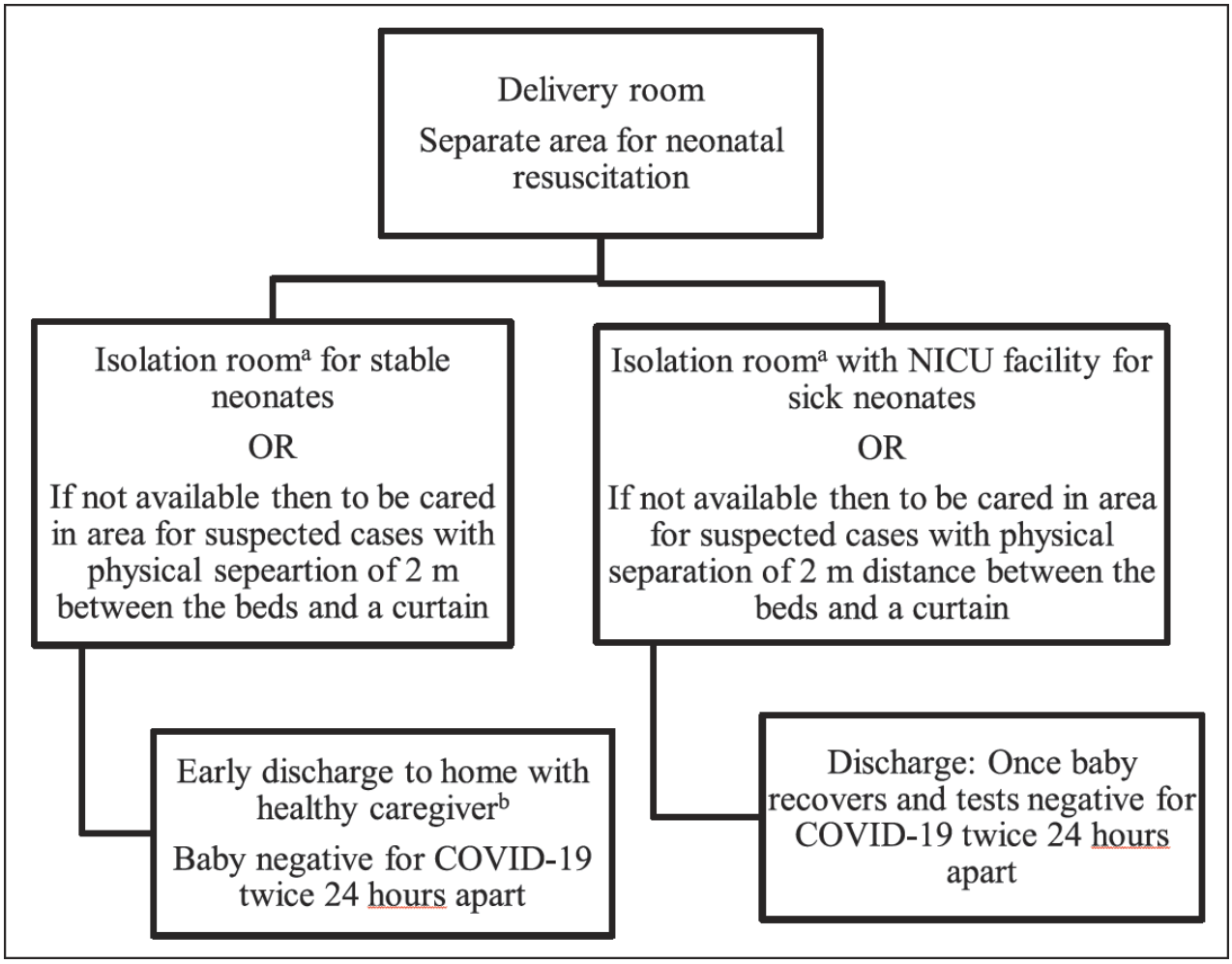
Parent's name

Doctor's Name Date Time

Appendix II

Flow chart for patient management

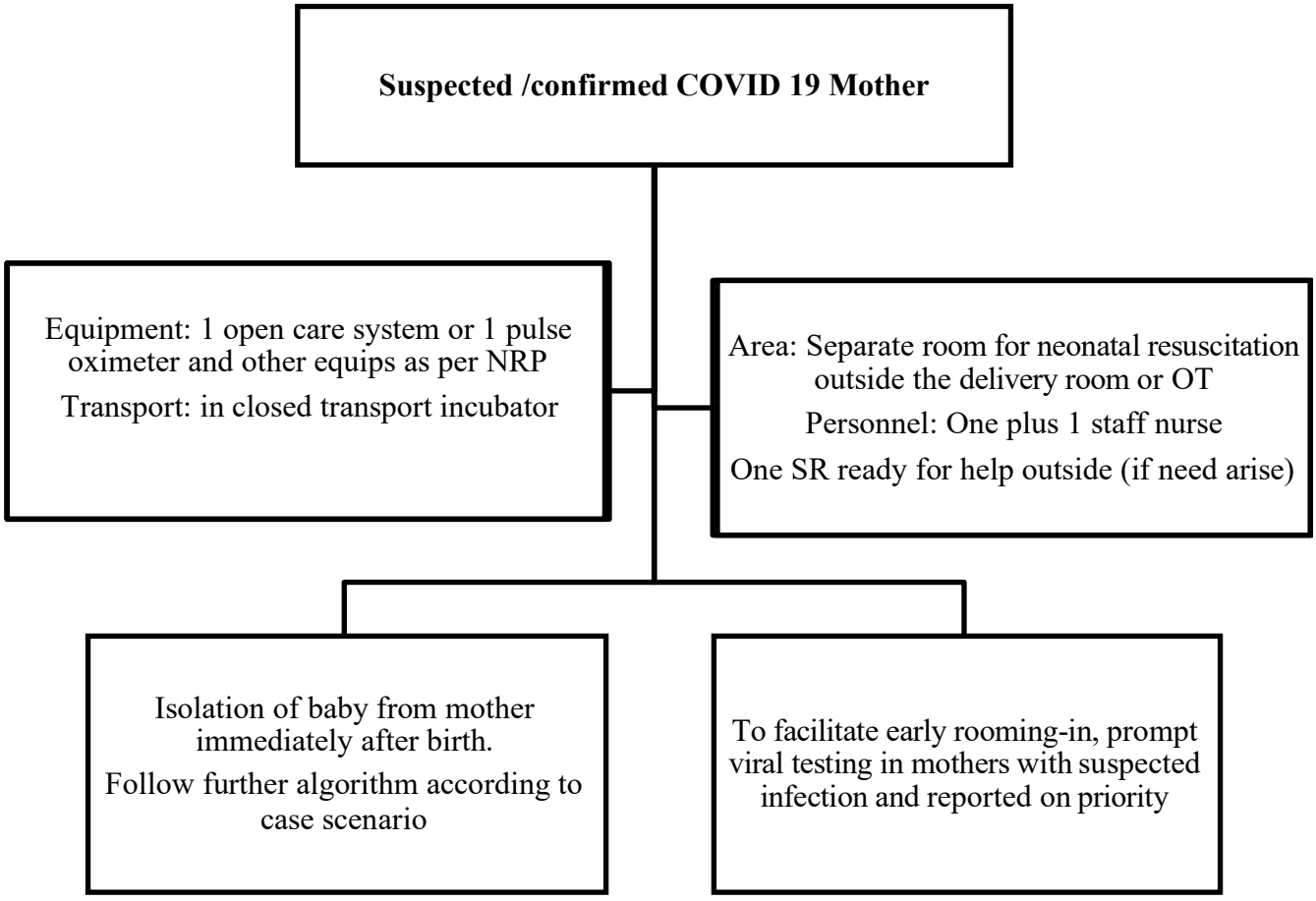
Flow Chart of Care Areas



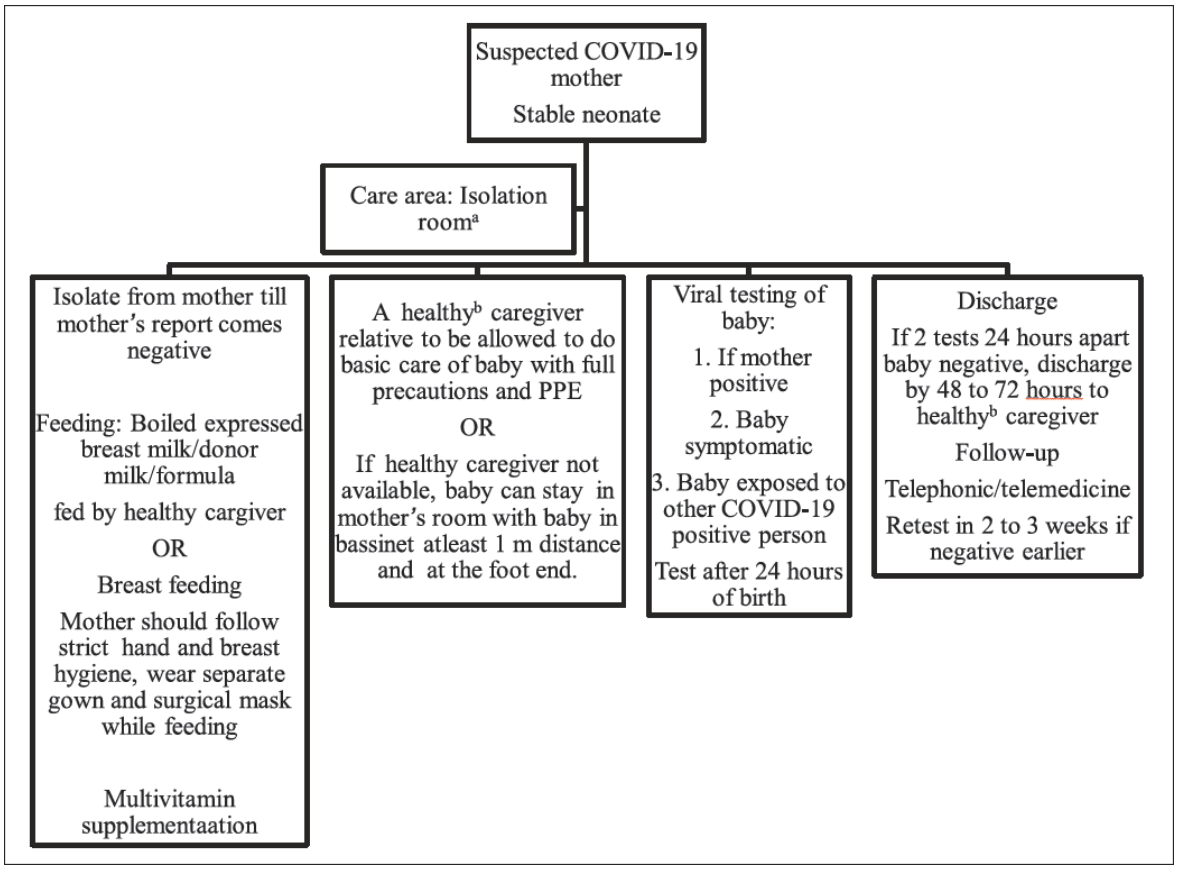
[a]Healthy caregiver: who is COVID 19 negative and hasn`t come in contact with mother or other positive case

[b]Room to be preferably negative pressure isolation rooms or if not facility for 2 exhaust fans

Delivery room management

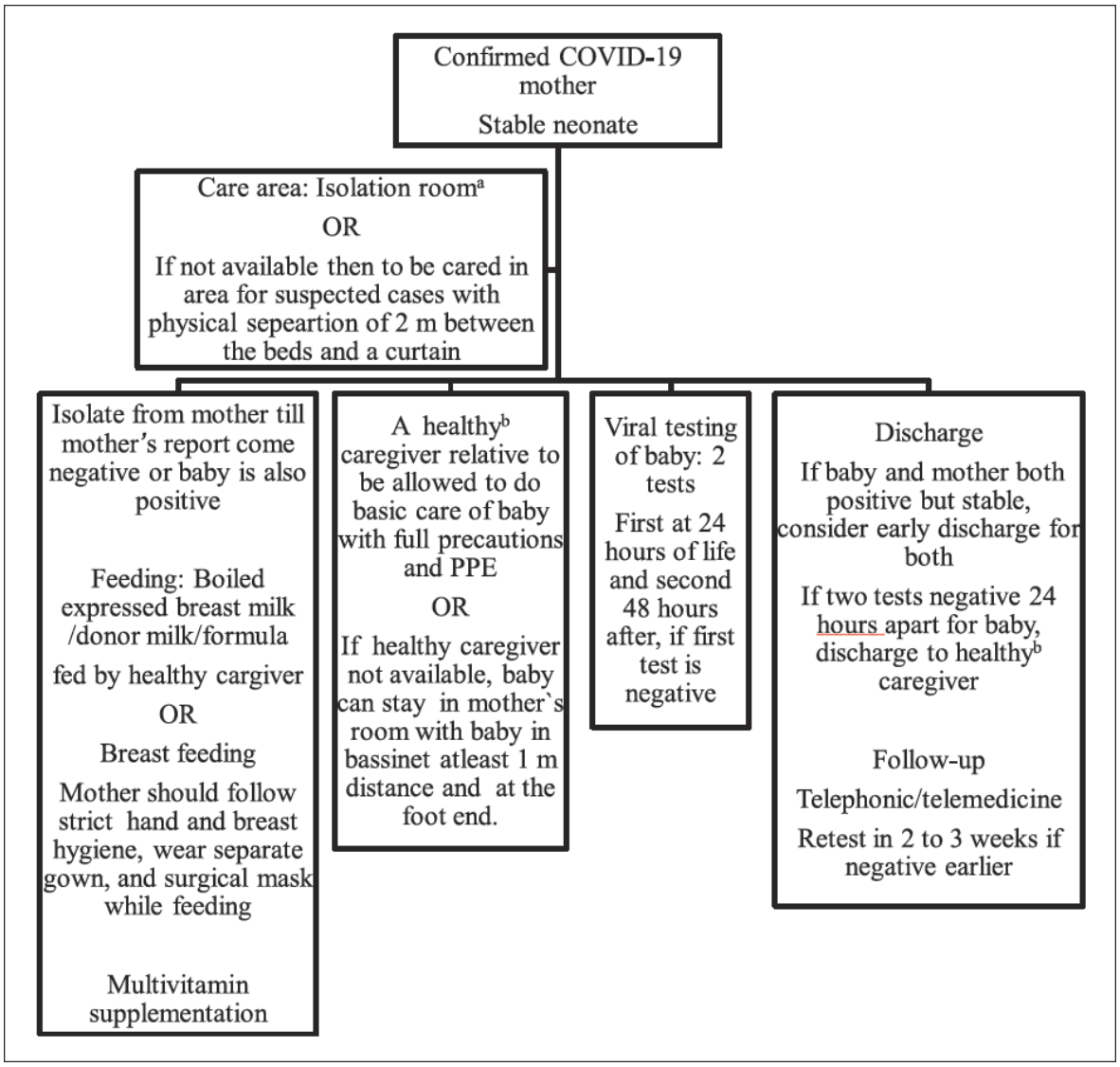


Management of Stable Neonate of Suspected COVID 19 Mother



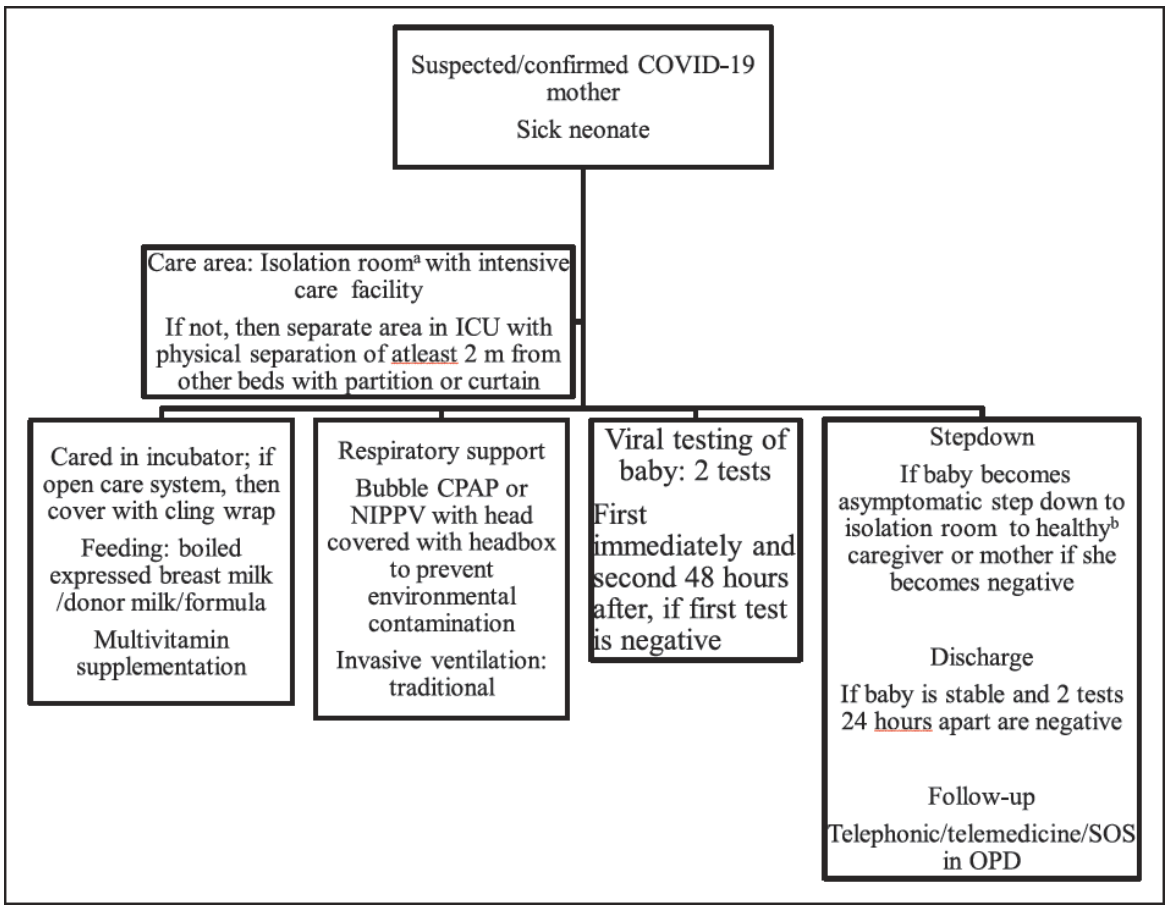
- [a]Room to be preferably negative pressure isolation rooms or if not facility for 2 exhaust fans.
- [b]Healthy caregiver: who is COVID-19 negative and has not come in contact with mother or other positive case

Management of Stable Neonate of Confirmed COVID 19 Mother



- [a]Room to be preferably negative pressure isolation rooms or if not facility for 2 exhaust fans.
- [b]Healthy caregiver: who is COVID-19 negative and has not come in contact with mother or other positive case

Management of Sick Neonate of Confirmed COVID-19 Mother



Transport of suspected/confirm COVID-19 patients

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Introduction:

COVID19 has been declared as a pandemic by the World Health Organization. During this prevailing pandemic, every hospital will have significant number of suspected and confirmed critically patient suffering from COVID19. It is not only about building the infrastructure but also about familiarizing staff with the workflow as human to human transmission of the virus is very high through droplet, contact and to some extent through airborne route. At times, patients will require inter and Intra-hospital transfer. Most of the Inter-hospital transfer will be following emergency admission to the isolation wards, intensive care units (ICU), or to radiological suites for necessary investigations. Inter-hospital transfer will also be necessary while escalating from primary to secondary/tertiary level of care, due to lack of further intensive care recourses in a particular hospital, or in need of specialized care not available in the hospital. In absence of established guidelines and protocols it will be challenging for the accompanying healthcare professionals to contain the spread of COVID19 infection during such transfer. The transportation of such patients should be done after proper communication and information relay based on recommendation of local health agencies. A thorough risk-benefit analysis centering on infection control measures like dissemination of contagion and potential benefit to patient is a prerequisite for any transfer. Cross border transport should be done as per local government guidelines only. The personnel involved should get familiar with each other and the paraphernalia of vehicle.

General considerations for inter-hospital transfer

Components:

The process of transfer can be divided into the following stages:

(i) Identify need of transferring a patient to another facility,

(ii) An agreement between the referring and accepting doctors (at the level of senior physicians),

(iii) Handover from referring critical care unit/treating unit staff to transfer team members (immediately preceding the transfer),

(iv) Transfer between care facilities,

(v) Handover from transfer team to accepting team in the referral centre,

(vi) Disinfection of transport vehicle and need for quarantine of personnel,

(vii) Safe return of transfer team and equipment to base hospital (1).

Inherent risks:

There are some inherent risks and challenges associated with critical care transfer. These can be divided into different categories:

1. Technical risks (patient/equipment related),
2. Non-technical risks (logistics, ambulance crew and resource management),
3. Administrative challenges related to organisations.

Incident reporting from large UK hospitals has shown that one-third of inter-hospital transfer related complications result in adverse outcomes including major physiological derangement (15%), patient/relative dissatisfaction (7%), prolonged hospital stay (4%), physical/psychological injury (3%), and finally death in 2% of patients undergoing transfer (3).

There is a fair possibility that these events are under-reported and the true incidence could be even higher (3). It is obligatory for the members of transfer organizing services to provide optimum in-transit care ensuring the safety of staff and patients (4).Monitoring and maintenance of physiological variables at their desired/targeted levels should be maintained during the transfer, with care provided by a competent and experienced team in a pragmatic manner (5).

Intra-hospital transfer is in no way a risk free proposition. Studies show medical staff report some form of difficulty or complication during two thirds of intra-hospital transfers (2).

Interestingly, careful patient selection, transfer planning, and equipment preparation results in improved outcomes, and some studies have shown up to 91% of these incidences are preventable (2).

Dissemination of contagion during transport and introduction of infection to newer territories/hospitals is a major concern. Disinfection and reuse of vehicle and equipment is also a major challenge. As ambulances, aircrafts are other transport vehicles make a closed space the risk of spread of contagion increases.

India specific concerns:

Containing the rapid spread of the infection is a national priority for a densely populated country like India. Therefore, planning and conducting safe transport for suspected or confirmed COVID19 patients are of paramount importance. After carefully reviewing the pattern of COVID19 spread in USA and EU countries, we can presume that in India increasingly more hospitals will be compelled to handle a similar situation. Transport of infected patients without standardized guidelines will result in nosocomial spread. Emergency responders who will handle the transport of COVID19 patients must follow the guidelines for the safety of the patients and healthcare personnel. Interfaculty transfer should weigh the gross benefit between two facilities. Objective criteria should be utilized and transfer shouldn't be just being decided on hospitality factors. Railways, navy and air force are ready for capacity building.

Inter- Hospital

- **Transfer Process:**

Preferably the decision to transfer a patient to another hospital should be agreed upon by the responsible consultants in both the referring and receiving hospitals. However considering rapidly changing scenario, which is anticipated during COVID19 outbreaks, the protocol can be more flexible as per the local/regional arrangements. During transfer, the prime responsibility for support and supervision of the transfer team lies with the referring senior

clinician (6,4). Team should constitute of experienced members conversant with intra- and inter- hospital transfer. In view of the highly contagious nature of COVID19 and rapidly changing physiological variables in critically ill COVID19 patients it is suggested that junior/trainee doctors should not be engaged in transfer when they are undertaking inter-hospital transfer for the first time, even if it's done under 'distant supervision'.

Optimal preparation and stabilization of the COVID19 patient before transfer is of paramount importance, in order to prevent problems and delay. A systematic approach consisting of 'Airway, Breathing, and Circulation (ABC)' is desirable to avoid oversight and pre-empt potential pitfalls. Proper resuscitation should preferably be completed before transfer. At least two intravenous access sites should always be available and accessible, and they must be of an appropriate size and adequately secured. Arterial lines should be well secured with non-invasive blood pressure monitoring in place (in opposite arm/leg), for use in the event of arterial line failure. Femoral central lines may get obstructed or be difficult to access during transfer; jugular or subclavian access is preferable. Vasopressors and inotropes should be prepared/stocked and to be kept ready to use, when required.

- **Emergency drugs and equipment:**

The dictum in transport is *"You have what you take"*. Drugs, likely to be required (i.e. inotropes, vasopressors, analgesics, sedatives, neuromuscular blockers), should be drawn up and readily available in appropriate doses. Medications (e.g. fluids and blood products) that are deemed as necessary, should be taken on the transfer with the required diluting solution, appropriate labels, lines and extension, and infusion pumps (adequately charged and with alternative cables). Transfer equipment should be compact, durable, well maintained and checked periodically. Most of the times additional equipment for ABC management is necessary; they should be kept in a dedicated transfer bag appropriately labelled. It is essential that the transferring clinicians are well accustomed to the transfer kit (site, arrangement, drugs and equipment available). This includes the ventilator and its circuit, infusion pumps, monitoring, suction, defibrillator, transfer bags and trolley, and should form part of any hospital's induction programme for selected groups of doctors expected to be part of future transfer teams. A specifically designed trolley is needed for transfer of the critically ill patient, rather than a standard ambulance trolley. This trolley should have docks for

keeping monitoring equipment, infusion pumps, the ventilator and oxygen cylinders systematically. This equipment should be securely attached to avoid injury to ensure both staff and patient during transfer (6). There should be port for suction and/or manipulation of endotracheal tube. Closed suction unit should be utilised. Once inside the ambulance, the transfer trolley must be locked into place and plugged into the vehicle's power source to prevent running off the battery and to ensure enough back up power in cases of energy failure. Adequate supply of PPE should be taken along. N95 mask should at least be worn during transport. However as a vehicle is a closed space high end PAPR could be used.

➢ Components of safety:

While transporting a suspected/confirmed COVID19 patient, crew should consider the following:

1) Early recognition of the deteriorating patient
2) Essential monitoring during transport of COVID19 patient
3) Safety of the healthcare personnel
4) Plans to handle any medical emergency arising during transport
5) Safety of the bystander
6) Post transport decontamination

❖ Early recognition of the deteriorating patient:

The early responder should be able to recognize the symptoms of COVID19. They should ask about the travel history, contact with suspected COVID19 patients, recent onset of dry cough, running high temperature, loss of taste/smell. They should be able to identify a sick patient on the basis of clinical presentation. In case of deterioration they should consider early intubation in with full personal protective equipment (PPE), taking necessary precautions before transfer.

Trigger for intubation are: Tachypnea (RR>= 24/m, SpO_2<90% on high flow rebreathing mask, and GCS <8. Following intubation and placement of invasive lines, the patient is now prepared for further transfer to higher referral centers, as decided.

All the teams, particularly the receiving team, should have complete patient information including estimated time of arrival.

❖ Monitoring during transport of COVID19 patient:

A **safety check list**should be filled before the transport (this ensures all necessary precautions are in place). Meticulous stabilisation, full clinical details and examination, ensuring essential monitoring before the transfer are of paramount importance to avoid any untoward incident during the transport. Some of the physiological variables needs to be monitored throughout the transport process.

If the patient is not intubated, recommendations of Association of Anaesthetists of Great Britain and Ireland (AAGBI) basic monitoring tools including ECG, NIBP, temperature and pulse oximetry will be adequate. For intubated patients, capnography/end tidal CO_2 monitoring ($EtCO_2$) is preferable. Patients should be optimally sedated (depending on the clinical condition) and if required muscle relaxants can used during the transport to avoid coughing episodes. Alarms (visual and audible) of all the monitors, ventilators and syringe pumps should be checked and adjusted before the departure. Arterial blood pressure monitoring and central venous pressure (CVP) are not mandatory but whenever a patient is intubated at a secured area, it is advisable to insert invasive lines. CVP line will help for vasopressor and inotrope administration in case of a hemodynamically unstable patient. Urine output to be measured while transporting a critically ill patient.

❖ Safety of the healthcare personnel:

Transport Medicine Society is committed for the safety for the all healthcare personnel while transporting COVID19 patients. During this COVID19 pandemic all patients with clinical presentations suspected of COVID19 should be consider as COVID19 positive, until proven otherwise.

All crew members including driver should use full PPE during the transport.

- ✓ **If the patient is stable enough**, then theyshould be seated/lying down on a stretcher on the back of the ambulance wearinga surgical facemask. Oxygen can be supplemented via a nasal cannula (under the surgical face mask).

Because of high risk of aerosol generation, it is advisable not to use open breathing circuits, high-flow nasal oxygenation or non-invasive positive pressure during transport.

- ✓ **In case of intubated patient:**

Use the HEPA filter to the expiratory limb of the ventilator. Always use close circuit suction while the patient is on ventilator. Avoid unnecessary disconnection of the breathing circuit. However, if needed switch the ventilator to stand-by mode, occlude the ET tube with a metallic clamp, do the necessary change and then connect the ventilator and remove the clamp. Do not forget to switch off oxygen flow before disconnecting the circuit and to resume the flow once the clamp has been removed. If manual ventilation is required use the HEPA filter to the ET end of the circuit before you begin respiratory support through Ambu bag.

❖ Plan to handle a medical emergency during transport:

Always assess the need for intubation prior to transport. Always keep a low threshold for intubation (Triggers as mentioned above), if the patient needs transfer to another centre for organ support.Intubation is best performed in ICU under controlled settings by experienced personnel wearing full PPE. Prepare transport equipment and drugs in anticipation of medical emergencies e.g. hypotension or sudden cardiovascular collapse. If bag mask ventilation is absolutely necessary (e.g. hypoxia, ET tube blockage by secretions) perform it gently and always use HEPA filter attached to ET tube.

❖ Safety of the bystander:

In case of intra-hospital transfer always use a pre-planned dedicated route for each destination.

Under any circumstances, bystanders are not allowed to accompany the suspected/confirmed COVID19 patients. Security team should lead and ensure clearance of bystanders for the entire designated route ahead of the transport team. Security team should maintain an optimum distance from the accompanying staff. Members of security team should wear surgical masks. In case of inter-hospital transfer, bystanders should not accompany the patient. They should be informed over telephone/video conference about critical status of the patient and an informed consent should be taken. Considering prevailing precarious situations in many parts of the country, assistance from local police may be needed while transferring such patients to another hospital.

Intra- hospital:

- **Transfer Process:**

Preferably, the decision to transfer a patient to another facility within the hospital should be agreed upon by the responsible consultants in both the referring and receiving facilities.

If intervention (e.g. angioplasty), is planned patient, must be taken to the respective clinical areas (e.g. radiology suite) directly. Suspect and confirm patients should not be kept waiting in the common area. Whenever possible, patients should be placed towards the end of clinical intervention lists. All the teams, particularly the receiving team, should have complete patient information including estimated time of arrival to facility. Always keep chief consultant, nodal officer and administrator in loop. Make a rapid system of communication. Complete preparation for Investigation/ procedure and post procedural transfer back to primary facility should be done. Following intubation and placement of invasive lines, the patient could be transferred to a normal ICU room (preferably negative chamber room).

Intubation and transport:

If a patient is already admitted in ICU, intubation should preferably take place in a negative pressure room. Intubation should be done using rapid sequence intubation (RSI) technique using a video laryngoscope. Operator should use PPE with N 95 mask, if available then closed helmet with O_2 flow with pressure. While connecting to the ventilator, the oxygen flow of Waters/Bain's circuit to be stopped, endotracheal (ET) tube should be occluded using a metallic clamp and thereafter ventilator circuit to be connected. Ventilation should resume after unclamping the ET tube and starting oxygen. ET tube should be connected to the ventilator circuit with (high efficiency particulate absorbing) HEPA filter if available.

Intensivist / Anaesthesiologist / Emergency physician who is responsible for intubation should take a swab for COVID19 at the time of intubation, and ideally should place invasive lines (arterial and central lines) and nasogastric tubes before leaving the room. Auscultation is not advisable, rather consider $EtCO_2$ asa mandatory tool to confirm correct ET tube placement.

Post transport decontamination:

1. In case of intra-hospital transfer, housekeeping team wearing full PPE should perform terminal cleaning of dedicated route including the elevator reserved for COVID19 patients. Staff involved with the transfer should handover the case to the receiving team at the final destination and doff powered air purifying respirators (PAPRs) and PPE in their designated bins (all the hospitals should have donning and doffing guidelines). PAPRs to be wiped thoroughly and disinfected using alcohol. In case of intra-hospital transfer, following handover to the receiving team at the final destination, transferring team should doff PPEs they used so far and don fresh PPEs before taking all the equipment and monitors to the ambulance I which the patient was brought. Staff to doff at the nearest clinical area upon arrival.Terminal cleaning of the ambulance should take place upon arrival back to the primary hospital with mopping of handles, knobs, and other equipments with 1% Sodium hypochlorite solution, prepared freshly. Metals and reusable articles should be sterilised by 70% alcohol based sanitizer.

   For floor of ambulance, Triple Mopping System is to adopt.

   a. Mopping with Plain water or with routine disinfectant, like lizol, followed by
   b. Dry mopping and then
   c. Mopping with 0.5 % or 1% (preferably) freshly prepared hypochlorite solution, and contact time of 10 minutes.

TRANSPORT OF COVID 19 DECEASED BODIES

There is no evidence so far of transmission of SARS-CoV-2 through the handling of bodies of deceased persons.

The potential risk of transmission related to the handling of bodies of deceased persons with suspected or confirmed COVID-19 is considered low and can be related to:

A. Direct contact with human remains or bodily fluids where the virus is present•
B. Direct contact with contaminated fomites.

As viable SARS-CoV-2 may persist on surfaces for days [8], there is the possibility that the virus also persists on dead body. Therefore, unnecessary contact with bodies should be minimized. While in direct contact with deceased cases of COVID-19 (both suspected or confirmed) should be protected from exposure to infected bodily fluids, contaminated objects, or other contaminated environmental surfaces through wearing of appropriate PPE. Minimum requirements include gloves and a long-sleeved water-resistant gown.

Transportation from site of death to body storage site:

Direct contact with human remains or bodily fluids should be minimized during transport of the body from the site of death and during reception at the designated body storage sites.

Those in contact with the wrapped body should wear appropriate PPE to minimize exposure to infected bodily fluids, contaminated objects and other contaminated environmental surfaces. The suggested set of PPE is gloves and long-sleeved water-resistant gown.

Monitoring of HCP:

HCP involved in transport should self-monitor for signs and symptoms. They should be quarantined and tested if breach of PPE or exposure has happened. They should be educated on local health guidelines on reporting and testing when deems necessary. Safety of HCP involved in transport is of paramount importance.

Summary

Transport of covid-19 suspects/confirm carries inherent risk. However, large number of patients will need transfer for varied reasons. The transfer should be carried on after thorough risk-benefit analysis. Communication, transfer policies and safety rules should be stringently followed during transfer process.PPE and safety of HCP takes paramount importance.

Acknowledgment: The authors are thankful to Ms. Nishtha Khunteta for her support in editing the present article.

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N-95 Masks Use/ Extended Use/ Rotational self-reuse Policy for SGPGIMS Staff

Who must use N95 Masks?

All health care workers (HCWs) ie. doctors, nurses, patient helpers and sanitation workers working in direct contact with suspected/confirmed COVID-19 patients must use N-95 masks.

N95 Masks MUST NOT be used by any staff working in non-patient areas which includes (a) Administrative office staff (b) Research staff (c) Security personnel (d) Support and maintenance staff involved in laundry, CSSD, kitchen, engineering, and air-conditioning.

N-95 MASK USE/ EXTENDED USE/ ROTATIONAL SELF-REUSE POLICY

Step-1*:* All HODs will **draw up a list of the HCWs functioning in the patient care areas.** Duty rosters should **minimize the number of HCWs** put on duty keeping. Optimal recycling of masks is **with 8 hours usage per day for 20 days**. The list of HCWs with their designations, CR Nos. and Phone numbers needs to be sent to SPO HRF by the HOD.

Step-2: All departments should designate one staff as **N95 manager,** who will get masks issued from HRF, maintain inventory,

Issue the masks by name and collect them after use from each HCW.

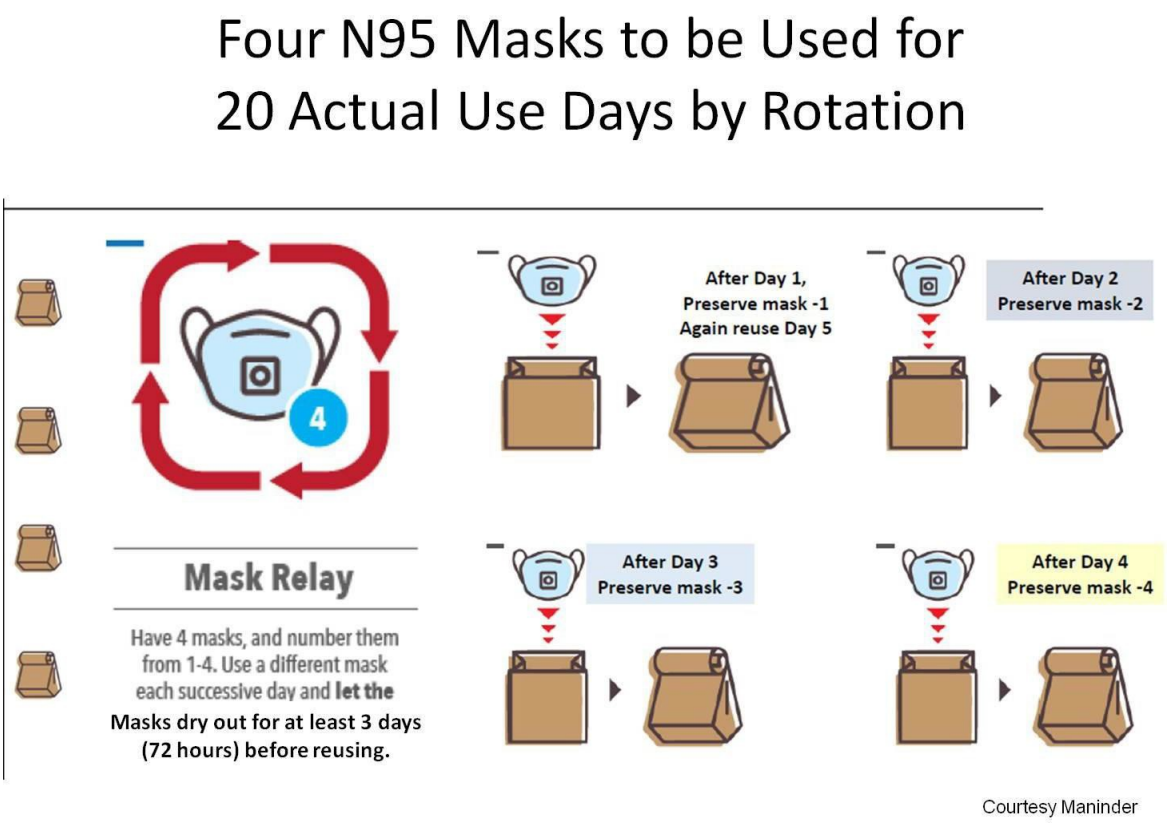
1. The department's **N95 manager will issue four N95 masks**, four brown paper bags, and a large zip-pouch to every eligible HCW, along with following instructions.
2. The HCW will **write** their **names, department, serial number (1-4) and date of first use** on each of the masks, paper bags and the zip pouch using permanent markers. The four masks are to be used for a **whole month (20 full working days) by rotation**, each mask for at least on five days.
3. **DO NOT THROW AWAY THE MASK AFTER USE, and reuse them** by rotation, after 72 hours of cooling off in between two usages. **Mask no. 1 will be used on day 1, day 5, day 9, day 13 and day 17.** Similarly, mask no. 2 will be used on days 2, 6, 10, 14, 18; and so on. *(See annexure)*
4. At the end of each work-day/ shift, **take off the N95 mask with care**. If needed, clean with a dry tissue/gauze, and place it in the brown paper bag of matching number. **Store the mask** in the paper bag at a clean and dry place, away from high temperatures, in a secure location at the work-place itself. Storing in sunlight is not essential.
5. **Do not try to dry/ disinfect/ sterilize** the masks using any washing, disinfectants, microwave/ dry heat/ etc., as it may damage the mask.

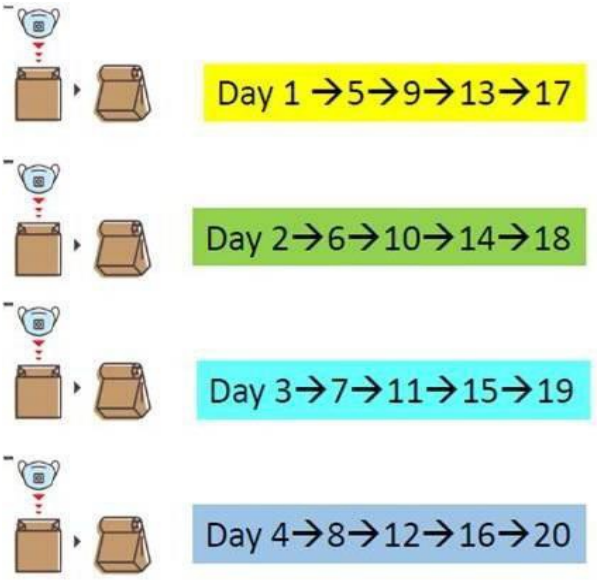
6. Please **learn the correct method of putting on the N95 and taking it off** to ensure these do not get damaged or soiled. You can put on a 3-ply mask/face shield/hood on top of the N95 mask while working in an area likely to cause soiling or contamination of the N95 mask.

STEP-3: At the end of the month put all masks in their brown bags, put these in the zip pouch, and hand over to the N95 manager, who will send them for appropriate disposal. One week prior to this, all HOD's need to send a fresh list of HCW's for next month so that new N95 masks can be issued. This is a dynamic **Standard Operating Procedure (SOP) document which will** be reviewed periodically, based on guidelines of MOHFW/ ICMR/ national institutions such as AIIMS, and availability of supplies at SGPGI. It is proposed to put this system into practice for the next one month and review it after one month or earlier, as the need arises.

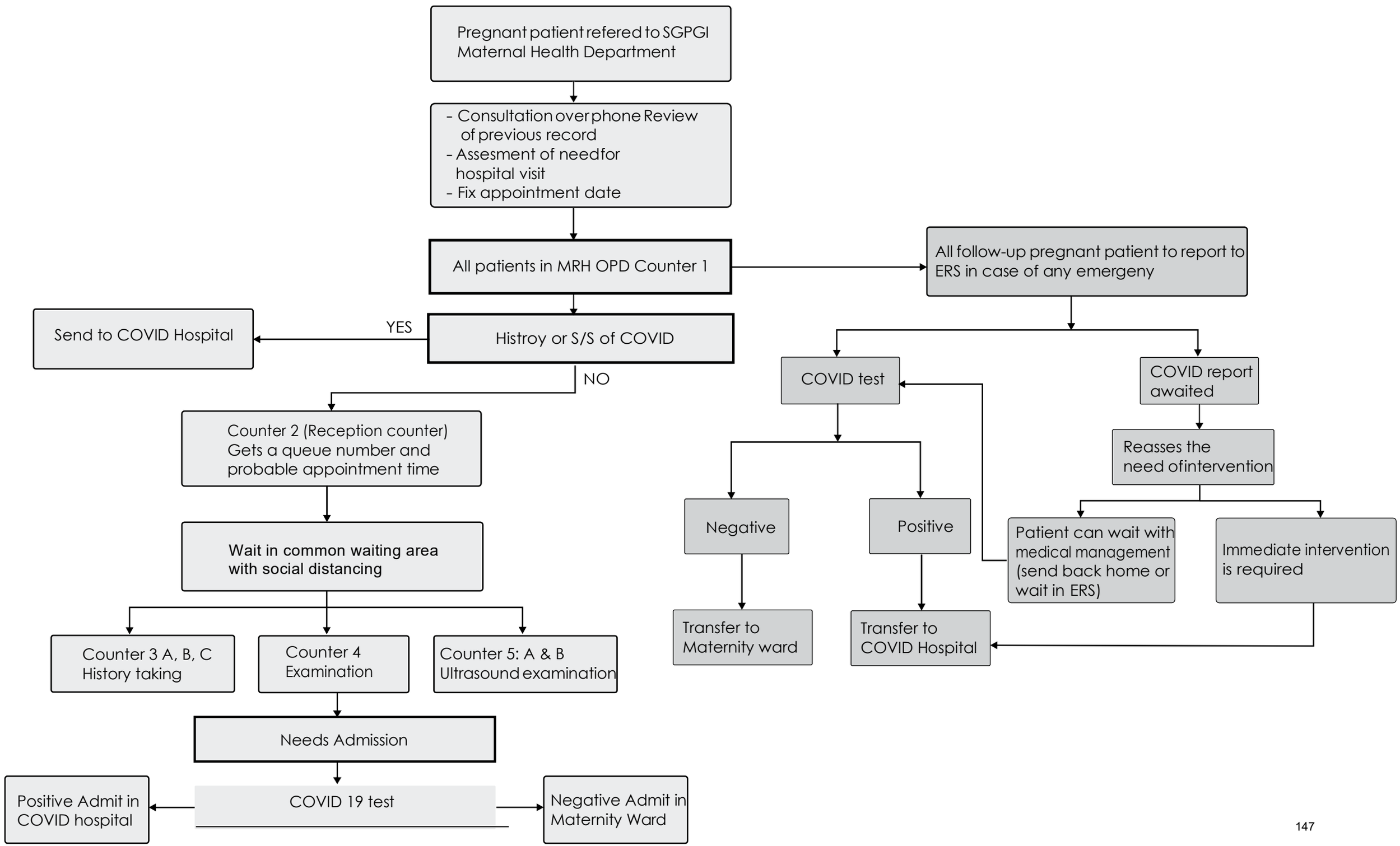
Issued jointly by Hospital Infection Control Committee and HRF Management Committee

Illustrative diagram explaining rotation self-reuse of N-95 masks





Work□ow of MRH Patients during COVID-19



OT Protocol for COVID 19 + ve Patients

SGPGIMS, Lucknow

Patient	OT in charge
• Disposable cap, gloves, shoe-cover, N95 mask. • PAC by audio-visual telemedicine. • Ab prophylaxis. • Consider antitussives in premedication • WHO checklist and consent digitally.	• Activate team • Handover keys of OT, donning area, drug almirah. • Supervise donning

Patient Transportation

- Quick and confidential
- Pre-defined shortest direct path from ICU/ ward.
- Dedicated stretcher
- Transfer by professionally trained personnel equipped with PPEs.
- Minimum patient handling

PREOP

Timely entry of minimum number of team members with no personal belongings

↓

Changing Area

↓

Donning area

OT assistant	OT Nurse	Anaesthesist + Anesthesia technician	Surgeon	Ward Boy
• Open OT, drug almirah, pen box. • Receive patient at the OT entrance door and shift patient to OT • Display essential imaging	•Prepare OT accordingly •Scrub nurse to scrub and prepare trolley. •Spare nurse to arrange essential consumables, instruments. •Monitoring activities like shifting of patients	• Prepare discardable drug tray and airway equipments. • Check anesthesia trolley. • Reassessment of patient in OT. • Airway assessment under transparent face cover. • Monitoring of patient	•Check instruments. •Marking area of surgery. •Transfusion arrangement if anticipated	•Receiving and positioning of patients •Cleaning of doffing area

INTRA OP

OT

- Negative pressure preferred with high air exchange i.e. cycle rate (≥ 20 cycles/h).
- AC to be based on air handling unit and separate from other OT.
- Minimize equipments, drug in OT.
- High touched surfaces like monitor and anaesthetic trolley must be plastic covered .
- BMW containers and alcoholic solution.
- Minimum in-out movement.

Anaesthesiologic consideration

- Regional anesthesia is preferred
- Oxygenation if needed by Hudson mask over N95 mask
- A box shaped/transparent sheet covered intubation extubation device (for GA).
- Intubation by most experienced after full muscle relaxation.
- High efficiency HME filter in patient end and expiratory limb.
- Low flow anesthesia, closed suction.
- Scavenging of gases via corrugated tube dipped in 1% HOCL soltn bucket.

Other Considerations-

- OT door must be kept closed at all times specially during intubation and extubation.
- Stand by items should be placed outside OT ready for use.
- OT assistant will retrieve standby items if needed.
- Laparoscopy should be avoided and intraoperative consultation is discouraged.
- Instrument and sponge count at end of surgery.
- New N95 mask to be applied immediately post extubation.
- Post extubation patient to be observed for ≥ 30 min in OT.

POST OP

Postoperative considerations

- Patient to be transferred back to pre-defined shortest direct path to ICU confidentially by trained personnel wearing PPEs via transport ventilator if needed.
- Unused consumables, tubes, circuits, pen and drugs in OT must be thrown away to BMW bin.
- Soda lime must be changed after each case.
- Specimen to be triple bagged, disinfect outer bag with alcohol wipes and send to core lab by trained person wearing PPEs.

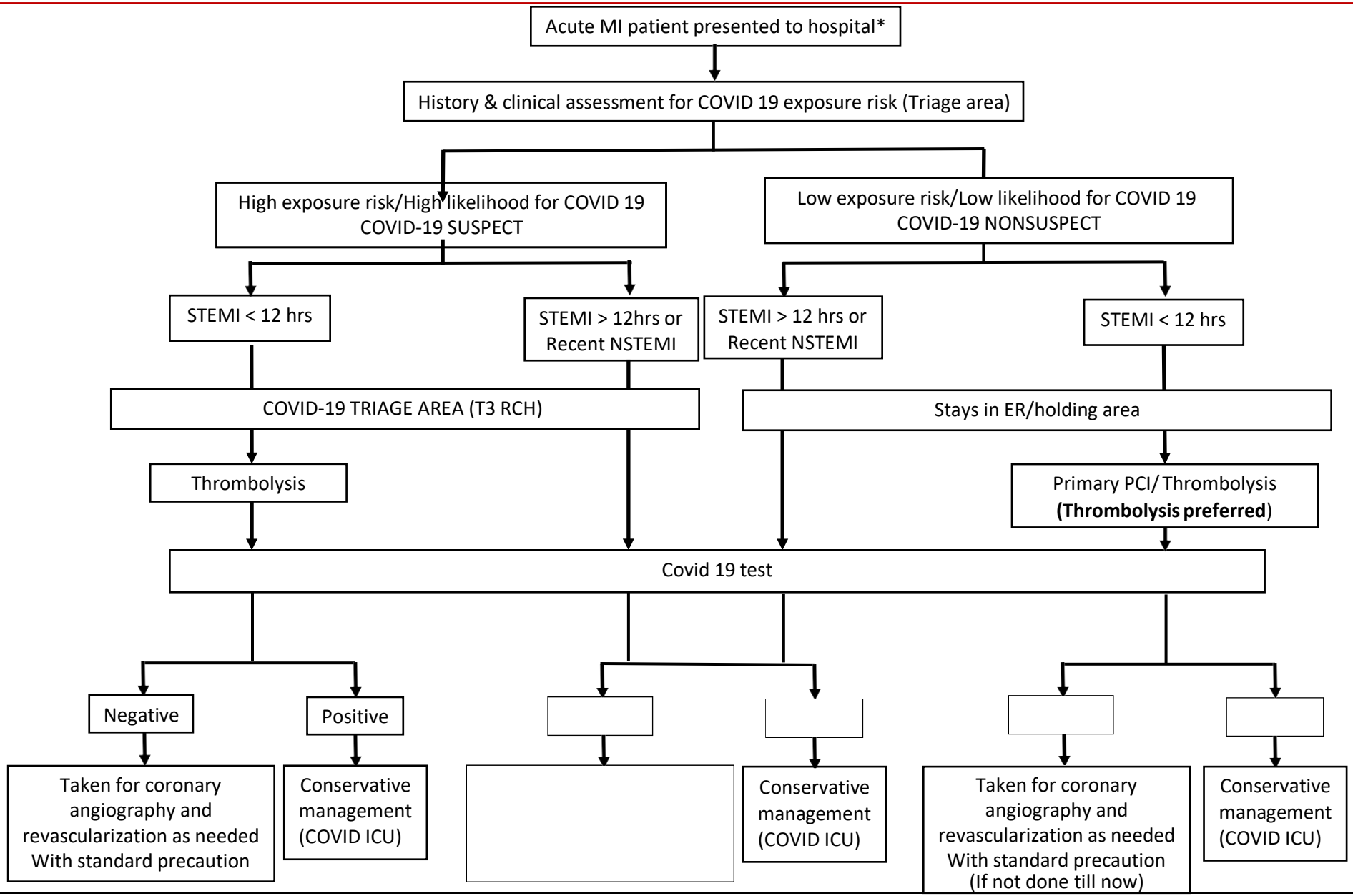
Doffing considerations

- Dedicated doffing area with shower facility is to be established.
- Items to be removed inside doffing area: shoe cover, gowns, gloves.
- Items to be removed outside doffing area: Cap, goggles, N95 mask,
- Don new cap, gloves and medical mask outside doffing area after taking shower.

Environmental sanitizations

- Full PPE must be donned during the sanitization procedure.
- OT and surrounding exchange areas must be sanitized with 1% hypochlorite as soon as possible after each procedure and discard the plastic covers of high touched area in yellow bin.
- Electromedical equipment (i.e., ventilator, radiological equipment, OT light, door handles) must be cleaned and disinfected with alcohol wipes.
- OT must be closed for at least 60 min for air exchange. Next patient to be taken after that.
- All personnel must doff properly under supervision and shower after each case

Recommended Protocol for Management of Acute Cardiac events during **COVID 19** pandemic– SGPGI, Lucknow



*Unstable patient with ongoing ischemia and/or hemodynamic instability with unconfirmed COVID 19 status to be taken for cardiac catheterization with adequate PPE. **It should not be performed if adequate PPE are not available.**

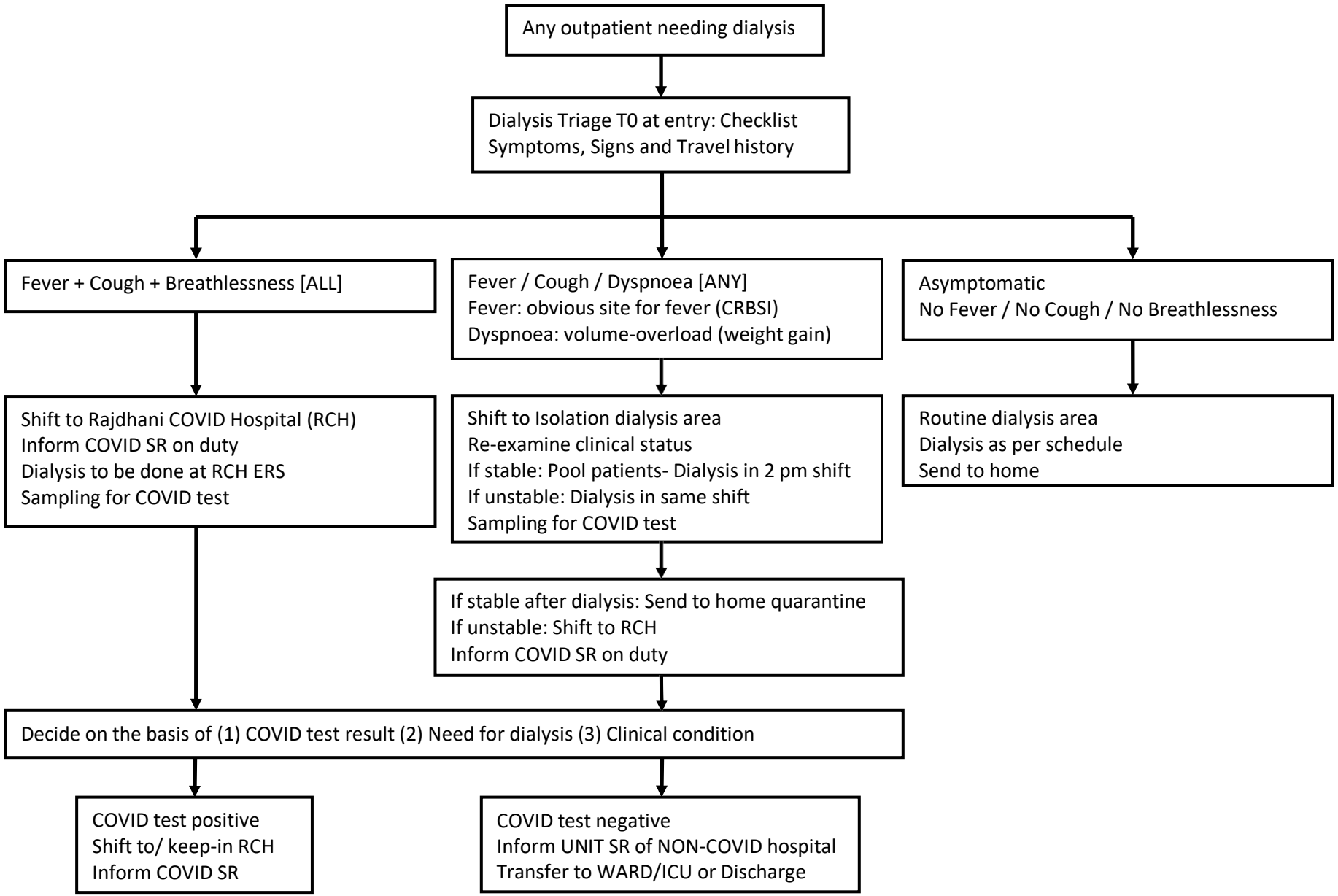
Protocol for patient requiring dialysis in NON-COVID hospital (Version. 1.1, Date 28/04/2020)

	Isolation dialysis area (COVID Suspect patients requiring dialysis)	Routine dialysis area-1 and Routine dialysis area-2 (Asymptomatic patients requiring dialysis)
Before entering to dialysis area	Screening (Dialysis T0) Suspected COVID symptoms	Screening (Dialysis T0) Asymptomatic
Dialysis areas	One area with separate entry/exit	Two areas with separate entries/exits
Dialysis schedule	If multiple patients and no volume overload or urgency Try to pool patients and do HD in 2 pm shift If urgent indications do HD in same shift	Routine schedule to be followed
Protection	Dialysis staff to wear PPE + Plastic apron + N95 + Goggles + Face shield + Double gloves Follow universal precaution Patients to wear triple layer surgical mask	Dialysis staff to wear Surgeon gown + Plastic apron + Head cover + N95/Triple layer surgical mask + Double gloves Follow universal precautions Patients to wear cloth mask or triple layer surgical mask
Dialysis	Call dialysis SR and modify dialysis order	Routine dialysis order
After dialysis	Raise COVID test for the patient (Microbiology>Virology) Sampling for COVID test Note CR No. and Mobile No. of the patient If unstable: Refer to COVID hospital (RCH) Arrange transportation inform both consultant (dialysis and RCH) and PRO (SGPGI and RCH) If stable: Send to home quarantine	No action
Doffing	Proper doffing and disposal of PPE kit after all patients leave and disinfection of surfaces is ensured	Proper disposal of protection kit
Disposal	Used PPE, dialyzer, tubing have to be properly disinfected and disposed Emptying of dustbins in every shift	Used PPE, dialyzer, tubing have to be properly disinfected and disposed Emptying of dustbins in every shift
Disinfection	Disinfection of floors and all surfaces after every shift by 1% hypochlorite Unit will be fumigated and closed for at least for 2-4 hrs/ need for next dialysis External surface disinfection of machine surface and screen after each shift as per manufacturer recommendations Internal disinfection of machine after each shift by Hot + Chemical (Citrate) disinfection	Disinfection of floors and all surfaces after every shift by 1% hypochlorite Unit will be fumigated and closed for at least for 2 hrs/ need for next dialysis External surface disinfection of machine surface after each shift as per manufacturer recommendations Internal disinfection of machine after each shift by Hot + Chemical (Citrate) disinfection

Protocol for patient requiring dialysis in NON-COVID hospital (Version. 1.1, Date 28/04/2020)

	Isolation dialysis area (COVID Suspect patients requiring dialysis)	Routine dialysis area-1 and Routine dialysis area-2 (Asymptomatic patients requiring dialysis)
Quarantine pending COVID test	Staff(s) connecting dialysis will undergo quarantine till COVID report is available (usually 12-24 hrs)	--
COVID test- Positive	Staff(s) connecting dialysis will undergo full quarantine according to institutes policy Staff(s) undergoing full quarantine will have to connect dialysis in Isolation dialysis area/RCH (if needed) for next 6 days Patient will be informed over phone and will be referred to RCH	--
COVID test- Negative	Staff(s) will return to routine dialysis duty roster	--

Protocol for patient requiring dialysis in NON-COVID hospital (Version. 1.1, Date 28/04/2020)



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