# संचालनालय स्वास्थ्य सेवायें मध्यप्रदेश

अति महत्वपूर्ण

क्रमांक / कोविड–19 नियंत्रण / आई.डी.एस.पी / 2020 /

भोपाल, दिनांक / 04 / 2020

प्रति,

- 1. समस्त मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी, म.प्र।
- 2. समस्त सिविल सर्जन सह मुख्य अस्पताल अधीक्षक, म.प्र।
- 3. अध्यक्ष, नर्सिंग होम ऐसोसिएशन, म.प्र।

विषयः– कोविड–19 के क्लीनिकल प्रबंधन संबधी तकनीकि निर्देश।

संदर्भः— एम्स, नई—दिल्ली का COVID-19 Preparedess Document दिनांक 21/04/2020 के क्लीनिकल प्रोटोकॉल

विषयातंर्गत लेख है कि प्रदेश में कोविड–19 की स्थिति को दृष्टिगत रखते हुए यह अत्यंत आवश्यक है कि समस्त चिन्हांकित अस्पतालों में कोविड–19 रोगियों का मानक प्रबंधन सुनिश्चित हो। इस हेतु एम्स, नई–दिल्ली द्वारा अपनाई गइ COVID-19 Preparedess Document के क्लीनिकल प्रोटोकॉल अवलोकन एवं अनुपालन हेतु संलग्न प्रेषित है।

निर्देशित किया जाता है किः-

- कोविड—19 रोगियों के क्लीनिकल प्रबंधन संबंधी निर्देश समय—समय पर देश के एपिडिमियोंलॉजिकल ट्रेन्ड को दृष्टिगत रखते हुए अद्यतन की जायेगी।
- 2. संलग्न मार्गदर्शी दस्तावेज में उल्लेखित समस्त प्रोटोकॉल का पालन सुनिश्चित की जाये।
- साथ ही, कोविड केयर सेन्टर (CCC), डेडिकेटेड कोविड हेल्थ सेन्टर (DCHC) तथा डेडिकेटेड कोविड अस्पताल (DCH) में भर्ती रोगियों को पर्याप्त पेय पदार्थ तथा सन्तुलित आहार प्रदान किया जाये।
- 4. रोग प्रतिरोधक क्षमता के वृद्धि हेतु Vit A, Vit D, Vit C तथा Zinc की उस अनुसार अनुशंसित प्रोफाईलेक्टिक खुराक दैनिक रोगी को प्रदान की जाये।
- 5. रोगी के Pulse Rate, Respiratory Rate तथा SPO<sub>2</sub> की विशेष निगरानी की जाये व निम्नानुसार Oxygen Theragy पी जाये:--

1.	<ul> <li>PR. 80-100/min and</li> <li>RR. 1620/min and</li> <li>SPO<sub>2</sub> 95-99% at Room air</li> </ul>	No Oxygen
2.	<ul> <li>PR. 80-100/min and</li> <li>RR. 16-20/min and</li> <li>SPO<sub>2</sub> 95-99% at Room air with heaviness in chest or easy fatiguabilty</li> </ul>	- prone positioning - Low flow Oxygen Support @2 litres/ min
3.	<ul> <li>PR &gt;100 but &lt;120/min and/or</li> <li>RR &gt;20 but &lt;25/min and/or</li> <li>SPO<sub>2</sub> &lt;95% but &gt; 90% at Room air</li> </ul>	- Moderate flow Oxygen Support @ 2-5 Litres/min
4.	<ul> <li>PR. &gt;120/min and/or</li> <li>RR &gt;25/min and/or</li> <li>SPO<sub>2</sub> &lt;90%</li> </ul>	<ul> <li>ECG</li> <li>High Flow Oxygen @ 5-8 Litres/min or more</li> <li>Close monitoring for need of mechanical Ventillation support</li> </ul>

- 6. यदि श्वसन संक्रमण से ग्रस्त रोगी का X-ray Inconclusive है तो रोगी के Breath Holding क्षमता एवं CT Scan की उपलब्धता को दृष्टिगत रखते हुए Infection Prevention and Control के मानक निर्देशों का पालन करते हुए रोगी का CT Scan कराई जाये।
- 7. कोविड—19 के रोगियों के स्वाख्थ्य लाभ हेतु आवश्यक मनोवैज्ञानिक समवर्धन हेतु मनोरंजन की व्यवस्था अस्पताल प्रबंधन सुनिश्चित की जाये।

# संलग्न- 1- Flow Chart for Oxygen Therapy in COVID-19 patients 2. COVID-19 Preparedness Document, AIIMS New Delhi.

(फैज अहमद किदवई) आयुक्त स्वास्थ्य, मध्यप्रदेश

क्रमांक / कोविड—19 नियंत्रण / आई.डी.एस.पी / 2020 / प्रतिलिपिः— सूचनार्थ । भोपाल, दिनांक 🛛 / 04 / 2020

- 1. अतिरिक्त मुख्य सचिव, लोक स्वास्थ्य एवं परिवार कल्याण विभाग, मंत्रालय, वल्लभ भवन, म.प्र।
- 2. प्रमुख सचिव, लोक स्वास्थ्य एवं परिवार कल्याण विभाग, मंत्रालय, वल्लभ भवन, म.प्र।
- 3. प्रमुख सचिव, चिकित्सा शिक्षा विभाग, मध्यप्रदेश शासन वल्लभ भवन, म.प्र।
- 4. आयुक्त, चिकित्सा शिक्षा, म.प्र।
- 5. मिशन संचालक, एन.एच.एम., म.प्र।
- 6. समस्त संभागीय आयुक्त, म.प्र।
- 7. समस्त कलेक्टर, म.प्र।
- 8. समस्त अधिष्ठाता, चिकित्सा महाविद्यालय, म.प्र।
- 9. प्रभारी, कोविड–19 नियंत्रण कक्ष, संचालनालय स्वास्थ्य सेवायें, म.प्र।

आयुक्त स्वास्थ्य, मध्यप्रदेश

# Flow Chart for Oxygen Therapy in COVID-19 Patients



21<sup>th</sup> April, 2020

# COVID-19 PREPAREDNESS DOCUMENT

AIIMS, NEW DELHI

This document is meant for internal circulation at AIIMS, New Delhi (draft)



Note: This document is dynamic and may be modified as per progression of the disease in India and when more data are available regarding epidemiology, transmission, and treatment.



AllMS, New Delhi

Version 1.1

21<sup>th</sup> April, 2020

	TABLE OF CONTENTS				
No	Title	Pages			
1)	Case definition	1			
	i. When to suspect	1			
	ii. Confirmed case	1			
	iii. Close contact	1			
2)	Clinical features	2			
3)	Laboratory diagnosis	3-5			
4)	Infection control measures	6-14			
	i. Hand hygiene	6			
	ii. Mask etiquette	7			
	iii. Steps of donning PPE	8			
	iv. Steps of doffing PPE	8			
	v. Decontamination and waste management	11			
	vi. Practices of environmental cleaning in healthcare facilities	12			
5)	Clinical management	15-20			
	i. Indications for hospital admission	15			
	ii. Management of mild cases	16			
	iii. Management of hospitalized cases				
	a) General measures	16			
	<ul> <li>b) Anticoagulation and specific therapy</li> </ul>	17			
	c) COVID-19 pneumonitis	18			
	d) Oxygen therapy	19			
	e) Ventilatory management	20			
	f) Awake proning protocol	21			
	g) How to intubate	22			
	h) ARDSnet protocol	23			
	i) Care of ventilated patient	24			
	<li>j) Supportive treatment in critically ill patients</li>	24			
	k) Septic shock	24			
	I) When to do dialysis	25			
	m) Pregnant patients	25			
	n) Breastfeeding patients				
	o) Discharge criteria				
6)	Appendix	26-40			
	i. Home quarantine/isolation guidelines for suspected/confirmed cases	26			
	ii. Transport protocol	28			
	iii. Precautions for hostel residents at AIIMS	29			
	iv. Guidance on use of PPE based on level of exposure	30			
	v. Effective disinfectants for use	34			
	vi. Algorithm for management of COVID-19 patients	35			
	vii. Drug interactions	36			
	viii. Management of dead body	3/			



# COVID-19 Preparedness Document AIIMS, New Delhi Version 1.1 LIST OF FIGURES

21<sup>th</sup> April, 2020

Figure 1: Helpline for COVID-19

- Figure 2: Specimen collection, packaging and transport guidelines
- Figure 3: Hand hygiene technique
- Figure 4: Facial hairstyles compatible with mask
- Figure 5: Steps of donning PPE
- Figure 6: Steps of doffing PPE
- Figure 7: Clinical syndromes associated with COVID-19
- Figure 8: Protocol for management of ARDS per ARDSnet protocol



AIIMS, New Delhi

Version 1.1

21<sup>th</sup> April, 2020

### **CHAPTER 1: CASE DEFINITION**

#### When to suspect

- All symptomatic individuals who have undertaken international travel in the last 14 days
  - or
- All symptomatic contacts of laboratory confirmed cases or
- All symptomatic healthcare personnel (HCP) or
- Hospitalized patients with fever AND cough and/or shortness of breath or
- Asymptomatic direct and high risk contacts of a confirmed case (should be tested once between day 5 and day 14 after contact)
- In Hotspots/cluster (as per MoHFW) and in large migration gatherings/evacuees centers: All symptomatic Influenza like illness (fever, cough, sore throat, runny nose)

*Symptomatic refers to fever/cough/shortness of breath.* 

Direct and high-risk contacts include those who live in the same household with a confirmed case and HCP who examined a confirmed case without PPE or with a breach in PPE

#### **Confirmed case**

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



Version 1.1

21<sup>th</sup> April, 2020

# **CHAPTER 2: CLINICAL FEATURES**

(Adapted from Report of the World health organization (WHO)-China Joint Mission on Coronavirus Disease 2019 based on 55,924 cases and a study on 1099 cases by Guan et al published in N Eng J Med)

- Fever (87.9%),
- Dry cough (67.7%),
- Fatigue (38.1%),
- Sputum production (33.4%),
- Shortness of breath (18.6%),
- Sore throat (13.9%),
- Headache (13.6%),
- Myalgia or arthralgia (14.8%),
- Chills (11.4%),
- Nausea or vomiting (5.0%),
- Nasal congestion (4.8%),
- Diarrhea (3.7%), and
- Hemoptysis (0.9%), and
- Conjunctival congestion (0.8%)
- ARDS (3%)
- Abnormalities on chest X-ray (59%)
- Radiological findings on chest CT scan (86%)



AIIMS, New Delhi Version 1.1

21<sup>th</sup> April, 2020

#### **CHAPTER 3: LABORATORY DIAGNOSIS**

As per directive from MoHFW (Ministry of health and family welfare), Government of India, all suspected cases are to be reported to district and state surveillance officers.



Figure 1: Helpline for COVID-19 (MOHFW, GOI)

#### Sample collection:

<u>Preferred sample</u>: Throat and nasal swab in viral transport media (VTM) and transported on ice <u>Alternate</u>: Nasopharyngeal swab, BAL or endotracheal aspirate which has to be mixed with the viral transport medium and transported on ice

#### **General guidelines:**

- Patients will be tested for COVID-19 at department of microbiology AIIMS, New Delhi
- Trained health care professionals to wear appropriate PPE with latex free purple nitrile gloves while collecting the sample from the patient. Maintain proper infection control when collecting specimens
- Restricted entry to visitors or attendants during sample collection
- Complete the requisition form for each specimen submitted
- Proper disposal of all waste generated

#### **Respiratory specimen collection methods:**

- A. Lower respiratory tract
  - Bronchoalveolar lavage, tracheal aspirate, sputum
  - Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.



21<sup>th</sup> April, 2020

#### B. Upper respiratory tract

• Nasopharyngeal swab AND oropharyngeal swab

<u>Oropharyngeal swab (e.g. throat swab)</u>: Tilt patient's head back 70 degrees. Rub swab over both tonsillar pillars and posterior oropharynx and avoid touching the tongue, teeth, and gums. Use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts. Place swabs immediately into sterile tubes containing 2-3 ml of viral transport media.

<u>Combined nasal & throat swab:</u> Tilt patient's head back 70 degrees. While gently rotating the swab, insert swab less than one inch into nostril (until resistance is met at turbinates). Rotate the swab several times against nasal wall and repeat in other nostril using the same swab. Place tip of the swab into sterile viral transport media tube and cut off the applicator stick. For throat swab, take a second dry polyester swab, insert into mouth, and swab the posterior pharynx and tonsillar areas (avoid the tongue). Place tip of swab into the same tube and cut off the applicator tip.

<u>Nasopharyngeal swab:</u> Tilt patient's head back 70 degrees. Insert flexible swab through the nares parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient. Gently, rub and roll the swab. Leave the swab in place for several seconds to absorb secretions before removing.



#### <u>AllMS, New Delhi</u>

Version 1.1

21<sup>th</sup> April, 2020



 For shipment-related queries/information, kindly contact Dr Sumit Bharadwaj (Scientist B, Influenza Group) on email: sumitduttbhardwaj@gmail.com, phone 020-26006290/26006390

Figure 2: Specimen collection, packaging and transport guidelines (ICMR)



Version 1.1

21<sup>th</sup> April, 2020

# **CHAPTER 4: INFECTION CONTROL AND PREVENTION MEASURES**

Patients suspected of having COVID-19 infection should be shifted to the isolation facility / designated COVID areas from the triage area as soon as possible. The HCP should be handling the patients after donning appropriate PPE according to their level of exposure as described in appendix IV.

#### Hand hygiene

- i. HCP should perform hand hygiene using alcohol-based hand rub (minimum 20 seconds) or by washing with soap and water (minimum 40 seconds). If hands are visibly soiled, use soap and water for hand wash.
- ii. Performed before and after using bathroom, before, during and after preparing food, before and after eating /drinking, after coughing, blowing or sneezing, after touching garbage, after touching mask or soiled PPE.
- iii. Foot operated sanitizers should be put outside elevators, OPDs, screening areas, ICUs and wards.



#### Figure 3: Hand hygiene technique (WHO)



21<sup>th</sup> April, 2020

#### Mask etiquette

If masks are worn, appropriate use and disposal is essential to ensure they are effective and to avoid any increase in risk of transmission associated with the incorrect use and disposal of masks.

- i. Place mask carefully to cover mouth and nose and tie securely to minimize any gaps between the face and the mask
- ii. While in use, avoid touching the mask
- iii. Remove the mask by using appropriate technique (i.e. do not touch the front but remove the lace from behind)
- iv. After removal or whenever you inadvertently touch a used mask, clean hands by using an alcohol-based hand rub for 20 seconds or soap and water if visibly soiled for 40 seconds
- v. Replace masks with a new clean, dry mask as soon as they become damp/humid
- vi. Do not re-use single-use masks
- vii. Discard single-use masks after each use and dispose-off them immediately upon removal
- viii. For N95 respirators adequate fit check must be performed after wearing. CDC recommends the following hairstyles styles for male HCP suitable for wearing N-95 respirators



Figure 4: Facial hairstyles compatible with mask (CDC)



21<sup>th</sup> April, 2020

#### Steps of donning PPE (Steps may vary depending on the kit used):

Donning of the PPE must be performed in designated area.

- 1. Remove home clothes, jewelry, watches, electronic etc. and wear clean hospital scrubs
- 2. Wash hands with soap and water
- 3. Wear shoe covers tie lace in front of the shin
- 4. Wear first set of gloves should be smaller than second pair, comfortable size, can be sterile or unsterile
- 5. Gown wear a clean disposable non-permeable gown, arm sleeves of gown should cover the gloves at the wrists, tie the lace behind snuggly without wrapping all around the waist. Decontaminate the gown if it becomes soiled. Remove gown only in designated doffing area and discard the gown before leaving patient care area
- 7. Wear the N-95 respirator cup the mask in hand, place the lower strap behind the neck passing below ears , then place the upper strap over back of head passing above ear. Check for snug fit of mask. There should be no more than minimal air leak from sides
- Wear eye piece adjust the strap according to required size, open the ports at upper end to prevent fogging while wearing, upper end N-95 mask should be covered by eye piece
- 9. Wear the hood hood should lay over the gown without leaving any open space.
- 10. Wear 2nd pair of the gloves should be of larger size than 1st pair, should cover free end of arms of gown. Change gloves if they become torn or heavily contaminated. Remove and discard gloves when leaving the patient room or care area, and immediately perform hand hygiene
- 11. Gown fitness check: Take help of companion for fitness check.

#### Steps of doffing PPE:

Doffing to be performed only in the designated area, check for any leak or soiling in PPE before doffing. If any, disinfect the area before doffing. Doffing room should have two chairs, one labelled "dirty" and the other "clean". All the PPE must be discarded as per routine protocol for handling biomedical waste. Hand hygiene MUST be performed after every step.

- 1. Disinfect the hands wearing gloves by following hand hygiene procedure.
- 2. Remove shoe covers only by touching the outer surface, and perform hand hygiene.



#### Version 1.1

21<sup>th</sup> April, 2020

- 3. Remove outer gloves and perform hand hygiene.
- 4. Remove hood and perform hand hygiene.
- 5. Remove gown slowly by holding the gown at the waist and pulling. Without touching the outer surface, remove with a rolling inside out technique. Perform hand hygiene again.
- 6. Remove eye piece by holding the straps, and perform hand hygiene.
- 7. Remove inner gloves and perform hand hygiene.
- 8. Wear another pair of sterile /unsterile gloves.
- 9. Remove mask Do not touch exposed surface of mask. First remove lower strap of mask, remove mask holding upper strap in a slow and steady pace (as to not generate aerosols)
- 10. Perform hand hygiene
- 11. Sit over clean chair and clean your shoes with alcohol swabs
- 12. Remove last pair of gloves and perform hand hygiene

If any leak is found in PPE while caring for infected patients, caring HCPs should self-quarantine (see appendix I).



#### AllMS, New Delhi

#### Version 1.1

21<sup>th</sup> April, 2020



Figure 5: Sequence of donning PPE (CDC)



#### AIIMS, New Delhi

#### Version 1.1

21<sup>th</sup> April, 2020



Figure 6: Sequence of doffing PPE (CDC)

#### Decontamination and waste management:

- Any 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



Version 1.1

21<sup>th</sup> April, 2020

adopted before decontamination and/or disposal.

- Where decontamination cannot be performed in the laboratory area or onsite, the contaminated waste must be packaged in an approved (that is, leak proof) manner, for transfer to another facility with decontamination capacity.
- For details of effective disinfectants, please refer to appendix V.

#### 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. Ensure that cleaning and disinfection procedures are followed consistently and correctly.

#### **Cleaning agents and disinfectants:**

- 1. 1% Sodium Hypochlorite can be used as a disinfectant for cleaning and disinfection
- 2. The solution should be prepared fresh.
- 3. Leaving the solution for a contact time of at least 10 minutes is recommended.
- 4. Alcohol (e.g. isopropyl 70% or ethyl alcohol 70%) can be used to wipe down surfaces where the use of bleach is not suitable, e.g. metals.

#### PPE to wear while carrying out cleaning and disinfection works:

- 1. Wear heavy duty/disposable gloves, disposable long-sleeved gowns, eye goggles or a face shield, and a medical mask (please see the PPE document for details)
- 2. Avoid touching the nose and mouth (goggles may help as they will prevent hands from touching eyes)
- 3. Disposable gloves should be removed and discarded if they become soiled or damaged, and a new pair worn
- 4. All other disposable PPE should be removed and discarded after cleaning activities are completed. Eye goggles, if used, should be disinfected after each use, according to the manufacturer's instructions.
- 5. Hands should be washed with soap and water/alcohol-based hand rub immediately after each



Version 1.1

21<sup>th</sup> April, 2020

piece of PPE is removed, following completion of cleaning.

#### **Cleaning guidelines:**

- 1. Where possible, seal off areas where the confirmed case has visited, before carrying out cleaning and disinfection of the contaminated environmental surfaces. This is to prevent unsuspecting persons from being exposed to those surfaces
- 2. When cleaning areas where a confirmed case has been, cleaning staff should be attired in suitable PPE. Disposable gloves should be removed and discarded if they become soiled or damaged, and a new pair worn. All other disposable PPE should be removed and discarded, after cleaning activities are completed. Goggles, if used, should be disinfected after each use, according to manufacturer's instructions. Hands should be washed with soap and water immediately after the PPE is removed.
- 3. Mop floor with routinely available disinfectant.
- 4. Wipe all frequently touched areas (e.g. lift buttons, hand rails, doorknobs, arm rests, tables, air/ light controls, keyboards, switches, etc.) and toilet surfaces with chemical disinfectants and allow to air dry. 1% sodium hypochlorite solution can be used. Alcohol can be used for surfaces, where the use of bleach is not suitable.
- Clean toilets, including the toilet bowl and accessible surfaces in the toilet with disinfectant or 1% sodium hypochlorite solution.
- 6. Wipe down all accessible surfaces of walls as well as blinds with disinfectant or bleach solution.
- 7. Remove curtains/ fabrics/ quilts for washing, preferably using the hot water cycle. For hot-water laundry cycles, wash with detergent or disinfectant in water at 70°C for at least 25 minutes.
- 8. Discard cleaning items made of cloth and absorbent materials, e.g. mop head and wiping cloths, into biohazard bags after cleaning and disinfecting each area. Wear a new pair of gloves and fasten the double-bagged biohazard bag with a cable tie.
- 9. Disinfect buckets by soaking in disinfectant or bleach solution, or rinse in hot water before filling.
- 10. Disinfectant or 1% sodium hypochlorite solution should be applied to surfaces using a damp cloth. They should not be applied to surfaces using a spray pack, as coverage is uncertain and spraying may promote the production of aerosols. The creation of aerosols caused by splashing liquid during cleaning should be avoided. A steady sweeping motion should be used when



# Version 1.1

21<sup>th</sup> April, 2020

cleaning either floors or horizontal surfaces, to prevent the creation of aerosols or splashing. Cleaning methods that might aerosolize infectious material, such as the use of compressed air, must not be used.

11. Biohazard bags should be properly disposed-off, upon completion of the disinfection work.

#### Frequency of cleaning of surfaces:

- 1. High touch surfaces: Disinfection of high touch surfaces like (doorknobs, telephone, call bells, bedrails, stair rails, light switches, wall areas around the toilet) should be done every 3-4 hours.
- 2. Low-touch surfaces: For Low-touch surfaces (walls, mirrors, etc.) mopping should be done at least once daily.

#### Precautions to take after completing the clean-up and disinfection:

- 1. Staff should wash their hands with soap and water immediately after removing the PPE, and when cleaning and disinfection work is completed.
- 2. Discard all used PPE in a double-bagged biohazard bag, which should then be securely sealed and labelled.
- 3. The staff should be aware of the symptoms and should report to their occupational health service if they develop symptoms.



Version 1.1

21<sup>th</sup> April, 2020

#### **CHAPTER 5: CLINICAL MANAGEMENT**

#### **Indications for admission:**

a) COVID Care Centers: Confirmed cases with mild disease

#### b) Hospital admission:

#### **COVID** Ward:

The following criteria may be applied to consider for admission (Any ONE of the following):

- 1. Respiratory rate  $\geq$  24/min
- 2. SpO2 < 94% on room air
- 3. Those at high risk for severe disease:
  - a. Age > 60 years
  - b. Cardiovascular disease including hypertension
  - c. Diabetes mellitus/other immunocompromised states
  - d. Chronic lung/liver/kidney disease
  - e. Cerebrovascular disease

#### **COVID ICU:**

- 1. Moderate/Severe ARDS
- 2. Multi-organ dysfunction
- 3. Shock
- 4. Transfer from ward to ICU if needs mechanical ventilation/closer monitoring

This is general guidance regarding which patients should be admitted. However, the final decision to admit and triage is at the discretion of the treating physician.



Version 1.1

21<sup>th</sup> April, 2020

#### Management of mild cases

- Mild cases are those with low grade fever/cough/malaise/rhinorrhea/sore throat WITHOUT any shortness of breath
- Admission in COVID care centers
- Contact and droplet precautions, strict hand hygiene
- Symptomatic treatment
- Tab Hydroxychloroquine 400 mg BD for 1 day followed by 400 mg OD for 4 days in patients with high risk factors for severe disease may be considered
- Antibiotics and antivirals as per clinician's discretion (to cover community acquired pneumonia including atypical pneumonia and Influenza)
- Low threshold for transfer of patients with high risk factor for severe disease to designated hospitals
- Discharge criteria:
  - As per guidelines

#### Management of hospitalized cases

#### **General Measures:**

- Symptomatic treatment
- Antibiotics and antivirals as per clinician's discretion (to cover community acquired pneumonia including atypical pneumonia and Influenza)
- Maintain euvolemia
- Monitoring:

Clinical:

- Work of breathing:
  - Excessive inspiratory efforts (requiring accessory muscles of respiration, large volume tidal breaths, air hunger)
  - Esophageal pressure monitoring (if available)
- Oxygen requirement
- Vital signs



#### Version 1.1

21<sup>th</sup> April, 2020

#### Laboratory:

- Routine: CBC with differentials, LFT, KFT, coagulation profile, Urine R/M
- Predictive and prognostic markers: CRP, LDH, Ferritin, D-Dimer, Troponin I

#### Anticoagulation

- All hospitalized patients should be started on prophylactic LMWH (e.g., Enoxaparin 1mg/kg per day Subcutaneously) if not contraindicated, and no high risk factors for bleeding are present
- Bleeding risk should be estimated with well validated risk scores (e.g. HAS-BLED score of ≥3 signifies a higher bleeding risk)
- In patient with a HAS-BLED score of 3, a risk benefit analysis should be done considering the risk of thrombosis based on level of D-dimer and SIC score ( ≥4 suggests high risk of thrombosis)
- In patients who are admitted to ICU, consideration should be given to therapeutic dose LMWH (e.g., enoxaparin 1mg/kg SC BD), if not at high risk of bleeding

#### Specific therapy:

- NO SPECIFIC ANTIVIRALS have been definitively proven to be effective as per currently available data.
- Drugs which have been tried in clinical trial settings include:
  - a) Hydroxychloroquine/Chloroquine
  - b) Lopinavir/ritonavir
  - c) Remdesivir
  - d) Nitazoxanide
  - e) Ivermectin
- Steroids may be considered in a defined subgroup of patients including:
  - Patients with critical disease (admitted in the ICU)
  - Given the potential for delayed viral clearance, the duration of steroid use should be limited to 3 to 5 days (with no tapering) in low to moderate doses (1-2mg/kg/day)

#### COVID-19 pneumonitis:

Broadly, COVID-19 pneumonitis can be divided into two primary phenotypes; L-type and H-type:

#### COVID-19 pneumonia, Type L

At the beginning, COVID-19 pneumonia presents with the following characteristics:



#### Version 1.1

21<sup>th</sup> April, 2020

- Low elastance: Nearly normal compliance
- Low ventilation-to-perfusion (VA/Q) ratio: Hypoxemia may be best explained by the loss of regulation of perfusion and by loss of hypoxic vasoconstriction
- Low lung weight. Only ground-glass densities are present on CT scan, primarily located subpleurally and along the lung fissures
- Low lung recruitability. The amount of non-aerated tissue is very low

#### COVID-19 pneumonia, Type H (Typical ARDS like picture)

- High elastance
- High right-to-left shunt
- High lung weight

#### Note:

- It is to be noted that these are not mutually exclusive but may represent the same disease process in **different stage of evolution**
- The combination of a negative inspiratory intrathoracic pressure and increased lung permeability due to inflammation results in interstitial lung edema (leading cause of patient self-inflicted lung injury (P-SILI) and is responsible for transition from L-type to H-type
- The typical imaging features in L phenotype

#### Oxygen therapy in COVID-19 pneumonitis:

- a) Non ventilatoy management (In patients with hypoxemia and low Work of Breathing):
  - Target SpO<sub>2</sub> 92-96% (88-92% in patients with COPD)
  - Preferable devices for delivering oxygen: Non-rebreathing Face mask, Venturimask and High Flow Nasal Cannula (HFNC) (if available)



Version 1.1

21<sup>th</sup> April, 2020

- Assessment of severity of hypoxemia/shunt: If patient achieves a SpO2 >95% at 15L/min O2 the shunt fraction is mild. Failure to achieve this indicates a moderate-severe shunt fraction.
- If the target is not achieved/maintained with the above mentioned devices, cautious trials of CPAP via oro-nasal mask/NIV via helmet interface maybe given.
- Try to achieve targets with lowest possible PEEP.
- Use of CPAP/NIV requires intensive monitoring for any increase in work of breathing/large tidal volume breaths [to prevent self-inflicted lung injury (SILI)] and hemodynamic instability
- Note:
  - NIV is associated with high failure rates, particularly in de-novo respiratory failure.
  - NIV without helmet interface is associated with greater risks of aerosolisation leading to higher exposure of health care workers (see table)
  - Placing a Surgical mask over Nasal Cannula (NC) may help in reducing dispersion

Table showing maximum exhaled air dispersion via different oxygen administration and ventilatory support strategies: (in a negative pressure room, with human simulator at an inclination of 45')

Method	Maximum exhaled air dispersion
	distance (in cm)
Oxygen via NC (5L/min)	100
Oxygen via simple face-mask (4L/min)	40
Oxygen via Venturi mask (FiO <sub>2</sub> 40%)	33
Oxygen via non rebreathing mask 12 L/min	<10
CPAP via oro-nasal mask (20cm of H <sub>2</sub> O)	Negligible
HFNC (60L/min)	17 (62cm sideways leakage if not



Version 1.1

21<sup>th</sup> April, 2020

	tightly fixed)
NIV via full face mask (IPAP 18cm/EPAP 5cm	92
H <sub>2</sub> O)	
NIV via helmet without tight air cushion	27
NIV via helmet with tight air cushion (IPAP	Negligible air dispersion
20cm/EPAP 10cm H <sub>2</sub> O)	

#### b) Ventilatory management:

- Indications for intubation:
  - Moderate to severe ARDS
  - $\circ$   $\:$  Increased work of breathing on non-invasive respiratory support or not tolerating NIV
  - Hemodynamic Instability



#### > Do 2D TTE in all intubated patients given increased heart lung interaction



Version 1.1

21<sup>th</sup> April, 2020

#### **#Prone positioning in COVID-19 pneumonitis:**

#### > <u>Awake proning prior to intubation:</u>

- May serve as an adjunct to use of non-invasive respiratory support and should only be used as a rescue therapy
- The benefit is usually short lived and lies in redistribution of perfusion
- Awake proning should only be considered if patient:
  - o Is Able to communicate and co-operate with the procedure
  - $\circ$   $\;$  Is Able to rotate to front and adjust position independently
  - Has no anticipated airway issue
- If patients fulfils criteria for proning, ask the patient to switch positions every 30 min to 2 hours ,while looking for improvement in oxygenation, as follows:
  - Lying on right side
  - Sitting up (30-60 degrees) by adjusting head of the bed
  - Lying on left side
  - Lying prone again

#### > <u>Proning after intubation</u>:

• Conventional guidelines should be followed in such cases, with the caveat that benefit may be transient in patients with L-phenotyope

#### How to intubate:

- Intubation trolley should be prepared and kept ready in ICU
- Intubation checklist should be displayed inside ICU
- The most skilled member of the team should be identified at the beginning of each shift for performing intubation
- Ensure proper fit of N95 mask and face shield before attempting intubation
- Pre-oxygenate with 100% FiO2 for 3-5 minutes with closed circuit (preferably)
- Try to avoid bag and mask ventilation (due to high risk of aerosol generation) but can be used if required by connecting an HME between mask and AMBU bag (or HME between



#### Version 1.1

21<sup>th</sup> April, 2020

mask and the catheter mount or circuit)- use two person, two hand technique (V-shape) for BMV with low flow and low pressure

- Use video laryngoscope and endotracheal tube with stylet for intubation
- Rapid sequence intubation (RSI) to be done using available induction agents (preferably etomidate 0.3 mg/kg) and muscle relaxants (Succinylcholine 1.5mg/kg or Rocuronium 1.2mg/kg)
- Monitor for hemodynamic instability during induction
- Use visible chest rise, end-tidal CO2 and subsequently X-ray chest to confirm correct position of tube as auscultation may not be possible with PPE
- In unanticipated difficult airway when intubation is not successful in two attempts, use 2<sup>nd</sup> generation laryngeal mask airway (i-Gel or Proseal LMA) as rescue device for ventilation and call for expert help
- Insert nasogastric/orogastric tube at the same sitting to avoid repeat exposure
- Remove the outer most pair of gloves as early as possible to avoid contamination to other surfaces
- After intubation, appropriate cleaning/disinfection of equipment and environment should be done

Initial ventilator settings					
Calculate predicted body we	ight (PBW)				
Male =	50 + 2.3 [height (inches) - 60] <b>OR</b>				
	50 + 0.91 [height (cm) - 152.4]				
Female =	45.5 + 2.3 [height (inches) - 60] <b>OR</b>				
	45.5 + 0.91 [height (cm) - 152.4]				
Set mode to volume assist-c	ontrol				
Set initial tidal volume to 6 i	nL/kg PBW				
Set initial ventilator rate ≤3	5 breaths/min to match baseline minute ventilation				
Subsequent tidal volume adjustment					
Plateau pressure goal: Pplat ≤30 cm H <sub>2</sub> O					
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 <sub>2</sub> O, decre	If Pplat >30 cm H <sub>2</sub> O, decrease tidal volume in 1 mL/kg PBW steps to 5 or if necessary to 4 mL/kg PBW.				
If Pplat <25 cm H <sub>2</sub> O and tic	If Pplat <25 cm H <sub>2</sub> O and tidal volume <6 mL/kg, increase tidal volume by 1 mL/kg PBW until Pplat >25 cm H <sub>2</sub> O 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 $\leq$ 30 cm H <sub>2</sub> O.					
If Pplat >30 cm H <sub>2</sub> O, decrease tidal volume in 1 mL/kg PBW steps to 5 or if necessary to 4 mL/kg PBW. If Pplat <25 cm H <sub>2</sub> O and tidal volume <6 mL/kg, increase tidal volume by 1 mL/kg PBW until Pplat >25 cm H <sub>2</sub> O 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 $\leq$ 30 cm H <sub>2</sub> O.					



Version 1.1

21<sup>th</sup> April, 2020

Arterial oxygenation and PEEP								
Oxygenation goal: PaO <sub>2</sub> 55	to 80 mmHg (	or SpO <sub>2</sub> 88 to 95 per	rcent					
Use these FiO <sub>2</sub> /PEEP combinations to achieve oxygenation goal:								
FiO <sub>2</sub>	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								
PEPP should be applied starting with the minimum value for a given FiO 2 .								

#### Figure 8: Protocol for management of ARDS (ARDS.net)

#### Care of ventilated patient:

- Fresh ventilator circuit to be used for every new patient
- Change circuit only when visibly soiled (not routinely)
- Use two HME filters- one at the patient end close to ETT and another at the ventilator end of expiratory limb of circuit. Do not use heated humidifiers
- HME-F to be changed only when visibly soiled
- Use closed inline suction system(avoid open suctioning)
- Use the same closed suction system to collect ET aspirate sample in a mucus trap chamber for RT-PCR
- Do not disconnect the circuit- push twist all connections
- In case disconnection is unavoidable (like patient transport) use deep sedation/muscle relaxation, put the ventilator on standby mode and clamp the ET tube just before disconnection
- Avoid nebulization (use MDI instead)
- Tracheostomy should preferably be delayed by the end of two weeks- possibility of decreased viral load
- Alternative ventilation strategy like APRV (Airway pressure release ventilation) and ECMO(extracorporeal membrane oxygenation) to be considered if indicated

#### Supportive treatment in critically ill patients:

- Head end elevation (30 to 45 degrees)
- Oral hygiene with mouthwash
- Glycemic control to maintain blood sugar between 140 to 180 mg/dl



#### Version 1.1

21<sup>th</sup> April, 2020

- Ulcer prophylaxis with proton pump inhibitors
- LMWH for thromboprophylaxis (as mentioned above)
- Foley's catheter and Ryle's tube placement
- Central venous catheter (CVC) insertion
- Pressure ulcer prevention by position change every 2 hourly

#### Septic shock:

- Recognize septic shock in adults when infection is suspected or confirmed AND vasopressors are needed to maintain mean arterial pressure ≥ 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 or more of the following: altered mental state; bradycardia or tachycardia (Heart rate < 90/min or > 160/min in infants and < 70/min or > 150/min in children); prolonged capillary refill (> 2 sec) or feeble pulses; tachypnea; mottled or cold skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.
- Management should be as per surviving sepsis campaign guidelines
- Choice of antibiotics: as per indication (community acquired vs hospital acquired) and local antibiogram

#### When to do dialysis:

- Urine output < 400 ml/24 hours
- Uremic encephalopathy
- Severe metabolic acidosis
- Uremic pericarditis
- Refractory hyperkalemia
- Fluid overload

Keep low threshold for dialysis as fluid overload and acidosis are detrimental in ARDS. Bedside dialysis to be preferred.



21<sup>th</sup> April, 2020

#### **Pregnant patients:**

- Testing to be prioritized
- Steroids may be given for fetal indications as per obstetrician's advice
- Obstetrician to monitor fetal well-being daily

#### **Breastfeeding patients:**

Currently there is no data suggestive of viral transmission via breast milk. However, due to close contact and risk of droplet transmission, breastfeeding should be avoided in COVID-19 confirmed mothers.

#### **Discharge Criteria:**

- Suspected case if the laboratory results for COVID-19 are negative, discharge is to be decided as per discretion of the treating physician based on his provisional/confirmed diagnosis
- Confirmed case resolution of symptoms, radiological improvement with a documented virological clearance in 2 samples at least 24 hours apart



AIIMS, New Delhi Version 1.1

21<sup>th</sup> April, 2020

**APPENDIX I: HOME QUARANTINE/ISOLATION GUIDELINES FOR SUSPECTED OR** 

#### **CONFIRMED COVID-19 CASES**

#### Instructions for home quarantine of COVID-19 contacts:

- Stay in a well-ventilated room separated from other people and pets
- Should preferably have attached/separate toilet
- Restrict his/her movement within the house.
- In shared spaces, maintain a distance of at least 1-2 meters and wear a medical mask when in proximity with other people
- Take special care to stay away from elderly people, pregnant women, children and persons with co-morbidities
- Do **NOT** attend any social/religious/public gathering e.g. wedding, condolences, etc.
- Wash hand often thoroughly with soap and water (at least 40 seconds) or with alcoholbased hand sanitizer (at least 20 seconds) especially after coughing and sneezing, and before and after eating, drinking and using the washroom
- Follow all steps of handwashing as described in chapter 4
- Avoid sharing household items with other people at home (e.g. dishes, drinking glasses, cups, eating utensils, towels, bedding etc.)
- Used three layered medical mask should be considered as potentially infected
- If symptoms appear (cough/fever/difficulty in breathing), he/she should immediately inform the nearest health center or call **011-23978046.**

#### Instructions for the family members of person being home quarantined/isolated:

- Household members should stay in a different room and be separated from the person as much as possible
- Only an assigned family member should be tasked with taking care of the person and should help with groceries, prescriptions and other personal needs
- Avoid shaking the soiled linen or direct contact with skin
- Pets should be cared for by household members and should be kept separate from the person



#### Version 1.1

21<sup>th</sup> April, 2020

- Use disposable gloves when cleaning the surfaces or handling soiled linen
- Stay at least 1 m away from those who are coughing
- Wash hands after removing gloves and before and after eating, drinking and using the washroom with soap and water (at least 20 seconds) or with alcohol-based hand sanitizer (at least 30 seconds)
- All non-essential visitors should be prohibited
- In case the person being quarantined becomes symptomatic, all his close contacts will be home quarantined for 14 days and followed up for an additional 14 days or till the report of such case turns out negative on lab testing

#### **Environmental sanitation:**

- Immediately remove and wash clothes and bedding that have blood, stool or other body fluids on them
- Clean and disinfect frequently touched surfaces in the quarantined person's room (e.g. bed frames, tables etc.) daily with Sodium Hypochlorite solution (1%) or ordinary bleach (5%)
- Clean and disinfect toilet surfaces daily with regular household bleach solution/phenolic disinfectants
- Wash laundry used by the person separately using common household detergent and dry thoroughly using the warmest temperatures recommended on the clothing label
- Place all used disposable gloves, masks and other contaminated waste in a lined container before disposing of them with other household waste and wash hands with soap and water/alcohol-based hand rub as shown in the picture below

Duration of home quarantine period is for 14 days from contact with a confirmed case or earlier if a suspected case (of whom the index person is a contact) turns out negative on laboratory testing. Duration of isolation for confirmed cases with mild disease is:

• Afebrile for 72 hours AND at least 7 days after symptom onset

OR

• 2 negative samples 24 hours apart



Version 1.1

21<sup>th</sup> April, 2020

#### **APPENDIX II: TRANSPORT PROTOCOL**

For shifting any suspected or confirmed COVID-19 patients, the following steps must be followed by the accompanying healthcare provider:

#### A. Decontaminate hands (alcohol-based sanitiser/soap)

#### B. Don PPE

# C. Inform Trauma Centre control room regarding the admission/transfer of a potentially infectious patient.

#### D. In ambulance

- Use single use or single patient use medical equipment where possible
- Use disposable linen if available
- Monitor and document vitals and medical management done in ambulance

#### E. Arrival at Trauma centre

- Before the patient leaves the ambulance ensure arrangements are in place for receipt of the patient
- Transfer patient to the care of hospital staff at Trauma Centre
- After transfer of patient remove PPE
- Perform hand hygiene

#### F. Before ambulance is used again

- Cleaning and disinfecting (PPE as outlined above should be worn while cleaning)
- Surfaces (stretcher, chair, door handles etc.) should be cleaned with a freshly prepared 0.5-1% hypochlorite solution or equivalent
- Medical equipment should be cleaned as per hospital infection control protocol



21<sup>th</sup> April, 2020

# **APPENDIX III: PRECAUTION FOR HOSTEL RESIDENTS AT AIIMS**

#### **Precautions for residents caring for COVID-19 patients:**

- To avoid meeting friends, colleagues, working staff in hostel. In case of unavoidable circumstances use face mask while meeting them
- Do not travel outside or within country unless absolutely indicated
- Food should be ordered from canteen to their room (Can order over phone)
- Hand sanitizer should be kept in room and as well as every wing in case of common bathroom
- Common bathroom to be cleaned twice daily
- Residents using common toilets can wipe seats after coming in body contact after each use
- Daily clothes used by the residents to be washed themselves and not to be given to laundry



# AIIMS, New Delhi

Version 1.1

21<sup>th</sup> April, 2020

# APPENDIX IV: GUIDANCE ON USE OF PPE BASED ON LEVEL OF EXPOSURE

Setting	Target personnel or patients	Activity	PPE
DESIGNATED COVID AREAS		1	
ICU	Healthcare workers (Doctor/Nurses/Technician) Cleaner/Sweeper/HA	Aerosol Generating procedures Disinfection	N95Goggles or Face shieldGown (Water resistant)Gloves (Double)Apron (optional)Shoe coverHoodN95GogglesGown (Water resistant)Heavy Duty GlovesBoots
Ward	Healthcare workers (Doctor/Nurses/Technician)	Non-Aerosol Generating Procedure	Hood N95 Goggles Gown (Water resistant) Gloves (Double) Shoe cover Hood
	Cleaner/Sweeper/HA	Disinfection/Patient Shifting	N95 Heavy Duty Gloves/ Gloves (Patient shifting) Goggles Gown (Water resistant) Boots Hood
Screening (Burns and plastic surgery)	Healthcare workers (Doctor/Nurses)	Screening	N95 Goggles Gown (Water resistant) Gloves (Double)



Reading the of wood and	AIIMS, New Delhi			
शरीरमाद्ये खलु धर्मसाधनम्	Versio	on 1.1	21 <sup>th</sup> April <i>,</i> 2020	
	Healthcare workers	Sampling	N95	
	(Doctor/Nurses)		Goggles	
			Gown (Water resistant)	
			Gloves (Double)	
			Shoe cover	
			Hood	
	Cleaner/Sweeper/HA	Disinfection/Patient	Triple layer mask	
		Shifting	Gloves (Patient shifting)	
			Heavy Duty Gloves	
DESIGNATED SCREENING AI	REAS			
Screening (New RAK OPD)	Healthcare workers	Screening	N95	
	(Doctor/Nurses)		Gown	
			Goggles	
			Gloves (Double)	
	Cleaner/Sweeper/HA	Disinfection	Triple layer mask	
			Heavy Duty Gloves	
			Boots	
Screening (Emergency Medicine;	Healthcare workers	Screening	N95	
Pediatrics OPD)	(Doctor/Nurses)		Goggles	
			Gown [Surgical Linen (OT Gown)] use with an apron	
			Gloves (Double)	
	Cleaner/Sweeper/HA	Disinfection	N95 mask	
			Gown	
			Goggles	
			Heavy Duty Gloves	
TRANSPORT of COVID SUSPE	CCT/ CONFIRMED CASE 1	IN AMBULANCE		
Ambulance (HCW travelling in	Healthcare workers	Attending patient	N95	
patient compartment)	(Doctor/Nurses)	(Direct contact >15	Goggles	
		min)	Gown (Water resistant)	



#### AIIMS, New Delhi Version 1.1

ज्ञरीरपार्ध खलु धर्मसाधनम्	Version	21 <sup>th</sup> April, 2020	
			Gloves (Double)
	Cleaner/Sweeper/HA	Disinfection	Triple layer mask
			Heavy Duty Gloves
	Driver	No Direct contact	Triple layer mask
NON-COVID AREA; MAIN HO	SPITAL, CENTERS		
<b>Emergency Medicine</b> (New	Healthcare workers	Non-Aerosol	N95 mask
Emergency; Pediatric Emergency;	(Doctor/Nurses/Technician)	generating procedure	Gown (In Red area only)
Surgical Emergency)			Gloves (Double)
	Cleaner/Sweeper/HA	Disinfection/Patient	N95 mask
		Shifting	Gloves (Patient Shifting)
			Heavy Duty Gloves
General OPD/EHS OPD	Healthcare workers	Non-Aerosol	N95 mask
	(Doctor/Nurses)	generating procedure	
	Cleaner/Sweeper/HA	Disinfection	N95 mask
			Heavy Duty Gloves
General Ward/Private Wards	Healthcare workers	Non-Aerosol	N95 mask
	(Doctor/Nurses)	generating procedure	
	Cleaner/Sweeper/HA	Disinfection/Patient	N95 mask
		Shifting	Gloves (Patient Shifting)
			Heavy Duty Gloves
ICUs	Healthcare workers	Aerosol Generating	N95 mask
	(Doctor/Nurses/Technician)	procedures in Non-	Сар
			Gown (Water resistant)
			Gloves
			Shoe cover
	Cleaner/Sweeper/HA	Disinfection/Patient	N95 mask
		Shifting	Сар
			Gown (Water resistant)



#### Version 1.1

# 21<sup>th</sup> April, 2020

		—	/ (p)
			Gloves (Patient Shifting) Heavy Duty Gloves Boots
EHS Dispensary	Pharmacist	Drug Dispensing	mask
Laboratory personnel	Doctor/Technician	Dealing with Respiratory samples	N95 mask Gown (Water resistant) Gloves Goggles
Radiodiagnosis	Doctor/Technician	Non-aerosol generating procedures	mask
Administrative offices	All staff	No direct/indirect patient contact	mask
COVID Confirmed case/Suspect	Patient	For Droplet prevention	mask



21<sup>th</sup> April, 2020

# **APPENDIX V: EFFECTIVE DISINFECTANTS FOR USE**

Disinfectant	Composition	Preparation	Use	Contact period
7% lysol	Benzalkonium chloride solution (80%), water, Laurel alcohol ethoxylate	15 ml in 1 litre of water	Toilet cleaning in non-ICU area (floor surface)	10 mins
Avagard Hand rub	2-propanolol, 1- propanolol	Dispense 3-5 ml on hand	Hand rub purpose	20 sec
1% Hypochlorite	When preparing chlorine solutions note that: Discard after 24 hours Avoid direct contact with skin and eyes Wear PPE Prepare in well ventilated area Use plastic container which is covered with lid	9 parts of water with 1 part of 10% sodium hypochlorite concentrated solution (final concentration 1%)	Ventilator circuits, oxygen mask, nasal prongs, suction jar and tubes, blood and body fluid stained instruments and linens	15 min
10% Hypochlorite			Decontaminate large blood spill>10ml	15 mins
0.1% Hypochlorite		99 parts of water with 1 part of 10% sodium hypochlorite concentrated solution (final concentration 0.1%)	Infected patient bed in isolation room	10 min
Detergent soap		Soap chips in hot water-dilute the concentrate daily	For general floor cleaning	5 min





#### AIIMS, New Delhi

Version 1.1

21<sup>th</sup> April, 2020

INTERIM CLINICAL GUIDANCE FOR MANAGEMENT OF COVID-19





Version 1.1

21<sup>th</sup> April, 2020

#### Category C

- 1. Chloroquine Azithromycin/Levofloxacin: QT prolongation/hypoglycemia
- 2. Chloroquine Aspirin/Linezolid: QT prolongation/hypoglycemia

X – Avoid combination D – Consider treatment modification C – Monitor therapy



21<sup>th</sup> April, 2020

#### **APPENDIX VIII: MANAGEMENT OF DEAD BODY**

#### Packing and transport of the dead body of patients of potential concern to mortuary:

- Death due to COVID-19 is a non-medicolegal case.
- The deceased must be placed in a zipped body bag immediately after death with identification tag marked 'COVID-19'.
- Ensure that the body is fully sealed in an impermeable body bag before being removed from the isolation room or area, and before being transferred to the mortuary, to avoid leakage of body fluid.
- Transfer the body to the mortuary as soon as possible after death.
- Autopsy for medical/pathological/legal reasons must be avoided if there is no substantial reason.
- If an autopsy is being considered, the body may be kept in refrigeration in the mortuary and the autopsy conducted only when a safe environment is available in that mortuary.
- If body is to be held for less than 48 hours, storage at 6°C or below is appropriate. If longer-term storage is needed, this should be at temperatures of approximately 4°C. Carry out regular temperature checks of cold storage facilities to confirm that refrigeration units are working effectively.
- When properly packed in the body bag, the body can be safely removed for storage in the mortuary, sent to the crematorium, or placed in a coffin for burial.
- The vehicle used for transporting the body from hospital to mortuary or crematorium should be properly disinfected and decontaminated with 1% Sodium Hypochlorite.
- Ensure that mortuary staff and the burial team apply standard precautions (i.e. perform proper hand hygiene and use appropriate PPE, including long sleeved gown, gloves and facial protection if there is a risk of splashes from the patient's body fluids or secretions onto the body or face of the staff member).

# If an autopsy is performed, collection of the following postmortem specimens is recommended:

- Postmortem clinical specimens for testing for SARS-CoV-2, the virus that causes COVID-19:
  - i. Upper respiratory tract swabs: nasopharyngeal swab AND oropharyngeal swab
  - ii. Lower respiratory tract swab: Lung swab from each lung



#### Version 1.1

21<sup>th</sup> April, 2020

- iii. Separate clinical specimens for testing of other respiratory pathogens and other postmortem testing as indicated
- iv. Formalin-fixed autopsy tissues from lung, upper airway, and other major organs

#### General guidance for workers / employee in mortuary:

- Mortuary and death care workers who have contact with human remains known or suspected to be contaminated must be protected from exposure to infected blood and body fluids, contaminated objects, or other contaminated environmental surfaces.
- The number of people allowed in the autopsy room should be limited.
- Use of an oscillating bone saw should be avoided for confirmed or suspected cases of COVID-19.
   Consider using hand shears as an alternative cutting tool. If an oscillating saw is used, attach a vacuum shroud to contain aerosols.
- After handing over the body of the deceased, the mortuary must be kept cleaned using 1% Sodium Hypochlorite. All the surfaces, instruments and transport trolleys should be properly disinfected with 1% Hypochlorite solution for a minimum period of 10 minutes.

#### PPE for handling dead bodies:

- Wear a disposable, long-sleeved, cuffed gown; if the outside of the body is visibly contaminated with body fluids, excretions, or secretions, ensure that this gown is waterproof. If no waterproof gown is available, wear a waterproof apron in addition to the gown.
- If splashing of body fluids is anticipated, use facial protection: preferably a face shield, or if not, goggles and a medical mask to protect the eyes and mucous membranes.
- Perform hand hygiene after taking off the PPE.
- Use PPE for heavy-duty tasks (e.g. rubber gloves, rubber apron and resistant closed shoes) in addition to regular PPE.

#### Personal protective equipment during autopsy:

- Engage a minimum number of staff in the procedure, and perform only if an adequately ventilated room suitable for the procedure is available;
- Scrub suit tops and trousers, or equivalent garments;
- Single-use, fluid-resistant, long-sleeved gown;



Version 1.1

21<sup>th</sup> April, 2020

- Surgical mask or certified N95, EU FFP2 or equivalent;
- Either autopsy gloves (cut-proof synthetic mesh gloves) or two pairs.
- Knee-high boots.
- Avoid splashes when removing, handling or washing organs, especially lung tissue and the intestines
- Clean surfaces that have become contaminated with tissues or body fluids and decontaminate by
  removing most of the tissue or body substance with absorbent materials; cleaning surfaces with
  water and detergent; applying the disinfectant standardized by the health-care facility if sodium
  hypochlorite solution is used wet the surface with the solution and allow at least 10 minutes contact
  time; rinsing thoroughly.
- Remove PPE before leaving the autopsy suite and follow appropriate disposal requirements. After removing PPE, always perform good hand hygiene practices.

#### Waste disposal:

- All waste generated from the mortuary or embalming room is potentially infectious and should be dealt with as risk waste.
- Staff that generate risk waste have a duty of care to ensure that it is correctly segregated, sealed and stored and disposed of appropriately, through a licensed agent. Anything that has been contaminated by body fluids should be sealed as risk waste.
- Body fluids and other contaminated liquids may be discharged into the drainage system.
- Liquid products from the management of human remains should not be allowed to drain into surface water, and working sinks in the mortuary and embalming room should be connected to the sewerage system.
- Extreme care must be exercised during the use and disposal of sharps. The use of disposable blades and needles is recommended and should be disposed of by the person who uses them.

Once the COVID-19 patient succumbs expires, the medical professionals should hand over the body of the deceased to relatives and friends for last rites assuring that the there is no spread of the infection preferably in a fluid proof coffin. The methodology to be adopted to make sure that no spread of infection to people who are dealing with the dead body are enlisted below:

• Handling staff should be appropriately dressed in PPE i.e. gloves, water resistant gown/ plastic apron over water repellent gown, and surgical mask. Use goggles or face shield to protect eyes, if there may be splashes.



Version 1.1

21<sup>th</sup> April, 2020

- All tubes, drains and catheters attached to the dead body should be removed before handing over to the relatives.
- Wound drainage and needle puncture holes should be disinfected, surgically closed and dressed with impermeable material. Secretions in oral and nasal orifices can be cleared by gentle suction if needed.
- Oral, nasal and rectal orifices of the dead body have to be plugged to prevent leakage of body fluids.
- Before packing the dead body, it should be cleaned and disinfected using sterilizing agent based on 70% alcohol or 1% Sodium Hypochlorite.
- Transfer the body to mortuary at the earliest with body covered in a robust, leak proof zipped transparent plastic body bag which is locked properly using nylon cable zip ties to avoid spillage of any fluids. The plastic body bag should not be less than 150 µm thick.
- The bagged body should be either wrapped with a mortuary sheet or placed in an opaque body bag.
- The body bag packing should again be disinfected using sterilizing agent.
- Embalming of such bodies should be avoided.
- Relatives are allowed to view the deceased one last time before last rites after followed standard precautionary measures and unzipping the face end of the body bag.
- For the purpose of last rites, cremation should be preferred for complete elimination of chances of infection in either electric or gas crematorium in situ in zipped body bag. However keeping in mind the religious views of the family, if the burial of the body is requested, then it should be assured that the body is buried in a thick, air tight coffin and placed at normal depth of burial (4 to 6 feet). It is recommended that the area above and adjacent to the grave should be cemented immediately as an additional precautionary measure and the space should be marked and required precautions should be taken to avoid scavenging by animals.
- As a precautionary measure large gathering at the crematorium/ burial ground should be avoided to maintain a healthy distancing.
- The remains of the last rites like ashes do not pose any risk of infection and can be collected for religious immersion.
- Remove personal protective equipment after handling of the dead body. Then, perform hand hygiene immediately.



#### Version 1.1

21<sup>th</sup> April, 2020

#### **References:**

- Guan W, Z. Ni, Y. Hu et al : Clinical Characteristics of Coronavirus Disease 2019 in China New Eng J Med 2020
- World Health Organization. (2020). Advice on the use of masks in the context of COVID-19: interim guidance, 6 April 2020. World Health Organization
- <u>https://icmr.nic.in/sites/default/files/upload\_documents/Strategey\_for\_COVID19\_Test\_v4\_09042020.pdf</u>
- Gattinoni L, Chiumello D, Caironi P, et al. COVID-19 pneumonia: different respiratory treatments for different phenotypes? Intensive Care Med. 2020 Apr 14:1–4.
- Ferioli M, Cisternino C, Leo V, et al. Protecting healthcare workers from SARS-CoV-2 infection: practical indications. Eur Respir Rev 2020; 29: 200068
- World Health Organization. (2020). Laboratory testing for coronavirus disease 2019 (COVID-19) in suspected human cases: interim guidance, 2 March 2020
- Thachil, J., Tang, N., Gando, S. et al. (2020), ISTH interim guidance on recognition and management of coagulopathy in COVID-19. J Thromb Haemost
- <u>https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-</u> recommendations.html
- Gautret P, Lagier JC, Parola P, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial Int J Antimicrob Agents. 2020;105949
- https://www.mohfw.gov.in/pdf/Corona%20Discharge-Policy.pdf