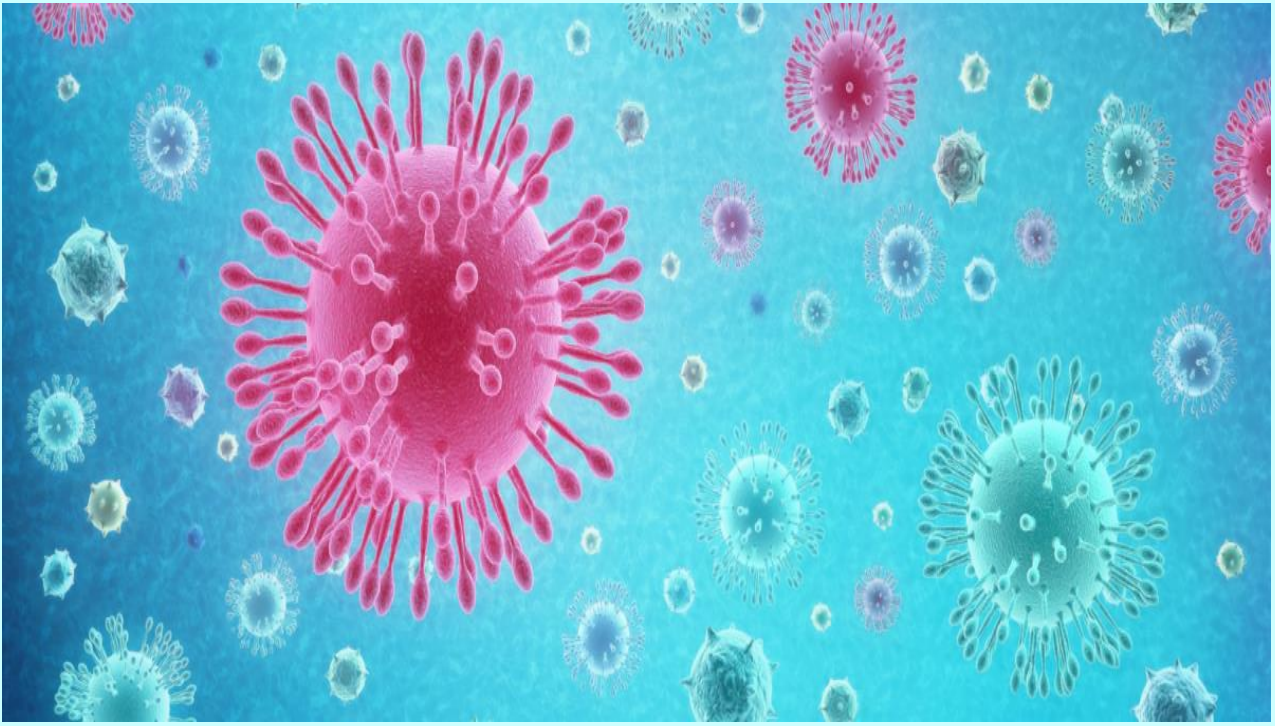


DR. RADHAKRISHNAN

GOVERNMENT MEDICAL COLLEGE HAMIRPUR



INFORMATION BULLETIN & SOP



COVID 19

**NEW SECTIONS ON NEWBORN MANAGEMENT AND
DENTISTRY**

डॉ० अनिल चौहान
प्रधानाचार्य

Dr. ANIL CHAUHAN
PRINCIPAL

principal.hamirpur@gmail.com
Ph. 01972-222999
Fax:01972-224326



डॉ० राधाकृष्णन राजकीय
आयुर्विज्ञान महाविद्यालय
हमीरपुर (हि०प्र०) 177001

Dr. RADHAKRISHNAN
GOVERNMENT MEDICAL COLLEGE
HAMIRPUR (H.P.)-177001

FOREWORD

The challenges of the COVID-19 pandemic are testing as well as taxing for all of us. With the rapidly changing scenarios, it is imperative that we have a set of guidelines and Standard Operating Procedures (SOPs) in place for the management for COVID-19 patients, as well as safety of the Healthcare professionals. This, along with initiating steps for the prevention and containment of the disease, will go a long way in ensuring uniformity of performance, while reducing miscommunication and failure to comply with the recommended protocols.

Rules and guidelines are, by nature, general. It is difficult to make provision for all eventualities. At the same time unnecessary fluidity leads to unproductive work and dilution of standards. The preparation of an information bulletin is therefore, always a delicate task. This set of SOPs and information has been compiled by the Faculty of this Institution, based on the available evidence and guidelines. I am sure it will be of immense value and help to the Front line workers of Dr. Radhakrishnan Govt. Medical College Hamirpur (HP) and all other health care workers engaged in contributing to curtail this pandemic.

Dr. Anil Chauhan,
Principal

PREFACE

The SARS-Cov-2 pandemic took the world by surprise in the beginning of this year, having a high mortality and not sparing any nation. The world is coming in terms with the management guidelines which are changing daily. This document is an attempt to compile the recent recommendations and guidelines. Every effort has been made to include the current recommendations and management guidelines but as new information and evidence is generated daily, this information bulletin can act as a guidance document along with the National and State guidelines.

This document is an Open Access document for use by the medical fraternity in its endeavour to care for the COVID-19 patients and the community at large.

ACKNOWLEDGMENTS

This document has been possible because of the motivation and encouragement of our worthy Principal Sir, Dr. Anil Chauhan, who has always motivated us to move high and stay a step ahead.

I would also like to take this opportunity to express my gratitude to Dr. Abhilash Sood for all the guidance and help in preparing this document.

This document would not have been possible without the help and support of all the Faculty who have contributed to this document they deserve the best appreciation

Thanks and Regards

DR. GIRISH KUMAR

List of Contributors (In alphabetical Order)

| | |
|--------------------------|----------------------------|
| Abhilash Sood, MD | Community Medicine |
| Anupriya Sharma, MDS | Periodontics |
| Anurag Sharma, MS | Obstetrics and Gynaecology |
| Ashok Kumar Bhardwaj, MD | Community Medicine |
| Devender Kumar, MD | Community Medicine |
| Ekta Dogra, MD | Community Medicine |
| Girish Kumar, MD | Pediatrics |
| Harjitpal Singh, MS | ENT |
| Laxmi Agnihotri, MS | General Surgery |
| Madan Lal PHD | Medical Microbiology |
| Manjit Kanwar, MD | Anaesthesia |
| Manupriya, MD | Pathology |
| Mohan K Thakur, MHA | Hospital Administration |
| Nitin Tangri, MD | Pulmonary Medicine |
| Nivedita Sharma, MD | Pediatrics |
| Ritu Shitak, MD | Pharmacology |
| Sanjay Kumar, MD | Community Medicine |
| Sanjay Thakur, MS | Orthopaedics |
| Shruti Anand, MS | Ophthalmology |
| Subhash Chand Sharma, MD | Internal Medicine |
| Tarun Sharma, MD | Internal Medicine |
| Yangshen Lhamo MD | Pharmacology |

INDEX

1. Background. 9
2. Epidemiology. 10
3. Pathophysiology. 11-114
4. Lab diagnosis and sample collection. 15-19
5. Clinical presentation and management principles.20-22
6. Treatment protocol for adult patient. 23-24
7. Critical care guidelines. 25-26
8. Pediatric COVID -19. 27-42
 - 8.1. Medical management
 - 8.2. ICU Management
 - 8.3. New born care
9. Immunization 43-45
10. Management Guidelines
 - 10.1. Anaesthesia 46-48
 - 10.2. Surgery 49-51
 - 10.3. Ortho 52
 - 10.4. Ophthalmology 53-55
 - 10.5. ENT 56-58
 - 10.6. OBG 59-60
 - 10.7. Dentistry 61-66
 - 10.8. Radio-diagnosis 67
 - 10.9. Mortality management 68
11. Standard operating procedures and recommendations. 69-117
 - 11.1. Guidelines for detection of suspect/confirmed covid-19 case in a non-COVID health facility.
 - 11.2. Recommendation for empiric use of hydroxy-chloroquine for prophylaxis.
 - 11.3. Flow chart of management of COVID-19 suspect patient.
 - 11.4. Update on pharmacological treatment for COVID-19
 - 11.5. Practices for environmental cleaning in healthcare facilities.
 - 11.6. Protective Measures :
 - 11.6.1. General / standard precautions for all:
 - 11.6.2. Steps of donning and doffing of PPE.

- 11.6.3. Personal Protective Equipment (PPE) for different area and sections.
- 11.6.4. When to use N95 mask.
- 11.7. Advisory **of not spraying of** disinfectant on people for covid-19 management.
- 11.8. Symptomatic and asymptomatic health care workers.
- 11.9. Advisory -for using 'rapid antibody test' in hot area - epidemiological studies and surveillance.
- 11.10. Advisory -therapeutic plasma exchange in covid-19.
- 11.11. Definition of suspected case and contact of covid-19.
- 11.12. Categorization of patients for the purpose surveillance
- 11.13. General guidelines for management
- 11.14. Surveillance and contact tracing
- 11.15. SOP for quarantine facility for the health care personnel and supporting staff performing duty at secondary isolation
- 11.16. Daily health monitoring format health care personnel providing services at covid 19 secondary isolation centre

BACKGROUND



COVID-19 is an infectious disease caused by a recently discovered novel Corona Virus. From being the virus that causes ‘common cold’, to today- where it has killed over 1, 64,656 people world-wide and it’s just getting started. The novel coronavirus (2019-nCov or SARS-CoV2) is the latest from the family of viruses known as ‘coronaviridae’. This family is notorious for causing respiratory disease outbreaks, second only to the Influenza family of viruses.

India, a country of 1.34 billion (134 crore), has much of its population living in poor hygiene and clustered environments. Developed countries like Italy and US are struggling to meet the healthcare demands coronavirus has produced. Needless to say, the health system of India is grossly under-equipped to handle a blow of the same magnitude

Number of cases have increased globally to more than 2482598 with 170484 deaths, in India approximately 24000 cases and 700 deaths have been reported. In Himachal 40 cases and one death has been reported till 26/4/2020.

EPIDEMIOLOGY



The epidemiology of COVID-19 shows that 75 to 80 % of the affected will develop only mild symptoms which do not require hospitalization.

- This disease is known to occur in all age groups.
- It can spread to children from other person suffering from the disease in the household although the infection is generally mild in children.
- Severe infection and mortality are seen only in high risk groups like elderly and those with chronic lung disease, heart disease, liver disease, renal disease, malignancies, immune-compromised, pregnancy, post-transplant, haematological disorders, HIV and in those on chemotherapy and long-term steroids.
- Epidemiology of COVID-19, SARS, MERS clearly demonstrate that hospitals act as amplifying centres for the epidemic. This happens due to mixing of patients with different risk categorization in the busy outpatient areas of designated COVID-19 centres.

So, patients with mild symptoms are advised not to come to hospitals for testing and treatment. Testing will not change neither that clinical course nor management of the patient with mild symptoms.



COVID-19 is not the first severe respiratory disease outbreak caused by coronavirus. Just in past two decades, coronaviruses have caused three epidemic diseases, namely, COVID-19, severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012. Bats are considered as the natural reservoir of a wide variety of coronaviruses, including SARS-CoV and MERS-CoV-like viruses. The recent COVID-19 novel SARS-CoV-2 also show 88% genomic identity to the sequence of two bat-derived severe acute respiratory syndromes (SARS)-like coronaviruses, suggesting that bat CoV and human SARS-CoV-2 might share the same ancestor.

Types and Structure of coronavirus

- Coronaviruses are divided into $\alpha/\beta/\gamma$ and δ CoVs. Alpha(α) and β CoV have the potential to spread to mammals while γ and δ CoVs tend to infect birds.

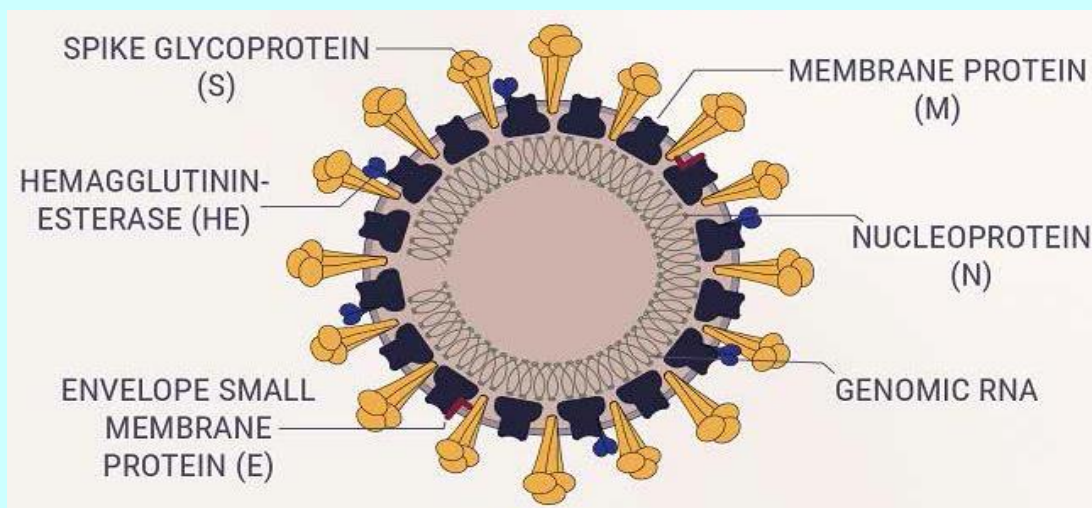


Figure -1: Ultrastructure of SARS CoV-2

- The SARS-CoV-2 is a β -CoV, which is an enveloped non-segmented positive-sense RNA virus.
- The genome contains at least ten open reading frames (ORFs).
- The first ORFs, about two-third of viral RNA are translated into two large polyproteins and finally processed into 16 non-structural proteins (nsp1-nsp16), which form viral replicase transcriptase complex.
- The other ORFs of SARS-CoV-2 on one-third of genome encode four main structural proteins: spike (S), envelope (E), nucleocapsid (N) and membrane (M) proteins as shown in figure 1.

Virus entry into host cell

- Coronavirus spike protein has been reported as a significant determinant of virus entry into host cells.
- The envelope spike glycoprotein binds to its cellular receptor, Angiotensin converting enzyme (ACE2) receptor found in abundance in the lower respiratory tract, ciliated bronchial epithelial cells and type II pneumocytes.
- This is a critical step for virus entry into host cell.

Replication and release of virus

- Then the viral genome RNA is released into the cytoplasm, the genome is transcribed and then

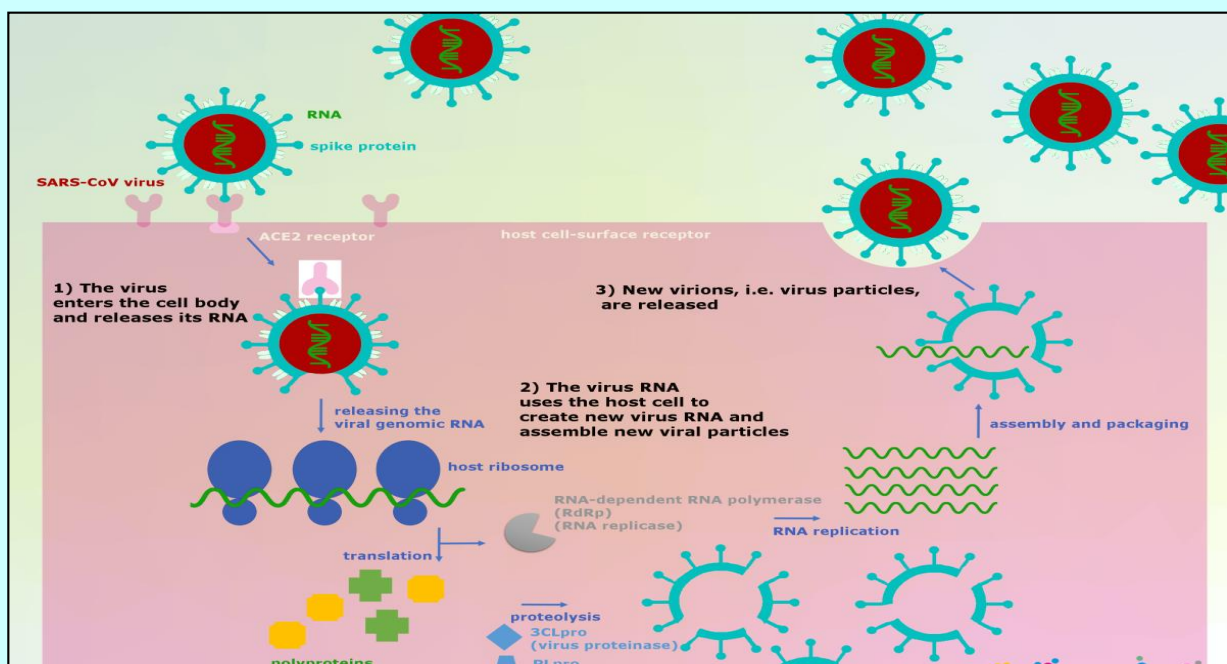


Figure -2: -Entry of SARS-CoV-2 into the host cell.

translated into two polyproteins and structural proteins, after which the viral genome begins to replicate.

- Mediating endoplasmic reticulum and Golgi, newly formed genomic RNA, nucleocapsid proteins and envelope glycoproteins assemble and form viral particle buds.
- Lastly, the virion –containing vesicles fuse with plasma membrane to release the virus as shown in figure 2.

Immune response

- The entire human population lacks immunity to SARS-CoV-2 and hence susceptible to it.
- Once the virus invades the host, its antigen is presented to the antigen presentation cells (APC) by major histocompatibility complex (MHC).
- It stimulates body's humoral and cellular immunity which are mediated by specific B and T cells.
- CD4+ T cells stimulate B cells to produce virus-specific antibodies, and CD8+ T cells directly kill virus-infected cells.
- T helper cells produce pro-inflammatory cytokines to help the defending cells. However, CoV can inhibit T cell functions by inducing apoptosis of T cells.
- The humoral immunity including complements such as C3a and C5a and antibodies is also essential in combating the viral infection.

Cytokine storm

- Patients with COVID-19 illness present commonly with fever, cough, fatigue, sputum production, headache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia.
- However, in certain circumstances, there is a deadly overreaction of the immune system which generates large amounts of pro-inflammatory cytokines (IFN- α , IFN- γ , IL-1 β , IL-6, IL-12etc.) and chemokine (CCL2, CCL3, CCL5, CXCL8 etc.), known as **cytokine storm** causing severe damages to the lungs, other organs, and in the worst scenario, multi-organ failure and even death as shown in figure-3

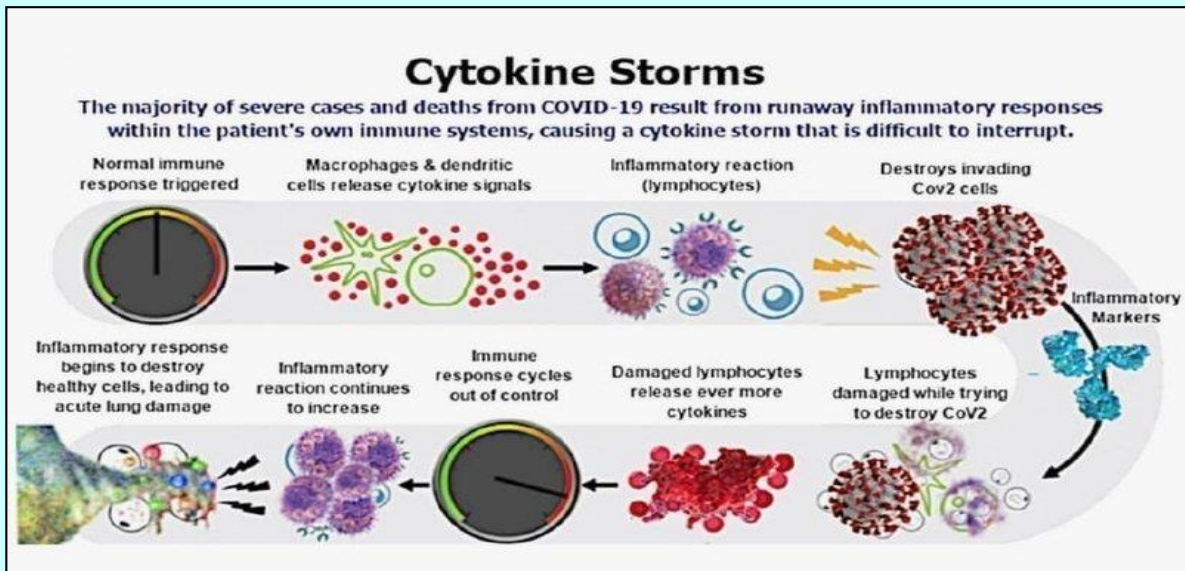


Figure-3: Complication of COVID 19 leading to ARDS and multi-organ failure

Transmission and spread

- It spreads via respiratory droplets and by fomites.
- When an infected person coughs or sneezes,
 - It release the droplets in the air which are inhaled a by person (within about 6 feet).
 - Some of the droplets which fall on nearby surfaces and objects transmits the infection when a person after touching these surface touches his/ her eyes, nose or mouth.
- **People are thought to be most contagious when they have symptoms and are sick. Despite absence of symptoms, an infected person can still PASS THE VIRUS.**

LAB DIAGNOSIS AND SAMPLE COLLECTION



There are two ways of testing for Corona Virus Infection.

1. IgM / IgG antibody testing (Lateral Flow assays)
- II. Real time polymerase Chain reaction (RTPCR)

1. ANTIBODY TEST

This has an advantage of being quick and cost effective, results are available in about 30 minutes. It has the simplicity that any health care provider with some training can do it. It is useful in emergency and community screening followed by confirmation by RTPCR, if the test is positive.

Sample.

Human serum, plasma, or whole blood samples. Fresh sample is preferred for testing immediately. When an appropriate amount of test sample is added to the sample well of the test cassette, the sample will move forward along the test card via capillary action. If the sample contains IgM and IgG antibody, the antibody will bind to the colloidal gold labelled novel coronavirus antigen. The antibody/antigen complex will be captured by the recombinant novel coronavirus antigen immobilized on the membrane, forming a red T line and indicating a positive result for the total IgG/IgM antibody

1. Negative Result -Indicates that no novel coronavirus antibody has been detected and test is negative for coronavirus antibody.
2. Positive Result -Indicates that the novel coronavirus IgG / IgM antibodies have been detected and the result is positive for coronavirus antibody.

Sensitivity and Specificity varies with the kit used, a study by Cormac Sheridan April 7th, 2020 reported Specificity 100 % and Sensitivity upto 70- 92.3 % between day 11-24 for IgM antibody.

2. REAL TIME POLYMERASE CHAIN REACTION (RTPCR)

PCR test are highly accurate but they are complex to use and slow to deliver results (4 – 6 hours)

Sample Collection

For reliable results it is very important to collect the proper respiratory tract specimen at the right time from the right anatomic site.

Protocol for sample collection for PCR

1. Mark the sample information on the label before sampling.
2. Collect the specimen from the following sites.
 - a. Nasopharyngeal Swab: from the nasopharynx by gently insert the swab into the nasal cavity for sampling.
 - b. Throat Swab: collect from the oropharynx.
3. Put the swab into the transport tube contains virus transport medium after sampling.
4. Snap the swab at the breakpoint into the transport tube and screw the cap tightly.
5. It is better to transport the collected samples to the laboratory with ice packs.

Method of testing





The COVID-19 RT-PCR test is a real-time reverse transcription polymerase chain reaction (rRT-PCR) test for the qualitative detection of nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens. The SARS-CoV-2 RNA is generally detectable in respiratory specimens during the acute phase of infection. Positive results are indicative of the presence of SARS-CoV-2 RNA. RNA isolated from upper and lower respiratory specimens is reverse transcribed to cDNA and subsequently amplified. During the amplification process, the probe anneals to a specific target sequence located between the forward and reverse primers. During the extension phase of the PCR cycle, the 5' nuclease activity of Taq











polymerase degrades the bound probe, causing the reporter dye to separate from the quencher dye, generating a fluorescent signal. Fluorescence intensity is monitored at each PCR cycle.

Sensitivity of test is 94% and specificity is 96%.

icmr | **NIV**
INDIAN COUNCIL OF MEDICAL RESEARCH | NATIONAL INSTITUTE OF VIROLOGY

Specimen Collection, Packaging and Transport Guidelines for 2019 novel Coronavirus (2019-nCoV)

| Requirements for Clinical Samples Collection, Packaging and Transport | | |
|--|---|---|
| <p>1. Sample vials and Virus Transport Medium (VTM)</p>  | <p>2. Adsorbent material (cotton, tissue paper), paraffin, seizer, cello tape</p>  | <p>3. A leak-proof secondary container (e.g., ziplock pouch, cryobox, 50 mL centrifuge tube, plastic container)</p>  |
| <p>4. Hard-frozen Gel Packs</p>  | <p>5. A suitable outer container (e.g., thermocol box, ice-box, hard-board box) (minimum dimensions: 10 x 10 x 10 cm)</p>  | |

| Procedure for Specimen Packaging and Transport | | | |
|--|--|--|--|
| <p>1. Use PPE while handling specimen</p>  | <p>2. Seal the neck of the sample vials using parafilm</p>  | <p>3. Cover the sample vials using absorbent material</p>  | <p>4. Arrange primary container (vial) in secondary container</p>  |
| <p>5. Placing the centrifuge tube inside a zip-lock pouch</p>  | <p>6. Placing the zip-lock pouch inside a sturdy plastic container and seal the neck of the container</p>  | <p>Note: Sample vials can also be placed inside a zip-lock pouch, covered in absorbent material and secured by heat-sealing or rubber bands. Then, the zip-lock pouch should be placed inside another plastic pouch and secured</p> | <p>7. Using a thermocol box as an outer container and placing the secondary container within it, surrounded by hard-frozen gel packs</p>  |
| <p>7. Using a hard card-board box as an outer container and placing the secondary container and the gel packs</p>  | <p>8. Placing the completed Specimen Referral Form (available on www.niv.co.in) and request letter inside a leak-proof, zip-lock pouch</p>  | <p>9. Securing the zip-lock pouch with the Specimen Referral Form on the outer container</p>  | <p>10. Attaching the labels:</p> <ul style="list-style-type: none"> • Senders' address, contact number; Consignee's address /contact number; • Biological substance-Category B; • 'UN 3373'; Orientation label, Handle with care  |

Documents to accompany:

- 1) Packaging list/proforma Invoice
- 2) Air way bill (for air transport) (to be prepared by sender or shipper)
- 3) Value equivalence document (for road/rail/sea transport) [Note: 1. A vaccine-carrier/ice-box can also be used as an outer container 2. The minimum dimensions of the outer container should be 10 x 10 x 10 cm (length x width x height)]

Routing of samples:

- Clinical specimens, official documents and Specimen request forms for testing of 2019-nCoV need to be sent to the ICMR-NIV address (The Director, ICMR-National Institute of Virology, 20-A, Dr Ambedkar Road, Pune, Maharashtra, Pin: 4110001).
- For shipment-related queries/information, kindly contact Dr Sumit Bharadwaj (Scientist B, Influenza Group) on email: sumitduttbhardwaj@gmail.com, phone 020-26006290/26006390

ADVISORY FOR SAMPLE COLLECTION SITES:

ICMR has no objection on adoption of establishing convenient sample collection sites (drive through centres for sample collection etc.) by the respective State Governments.

However, the following advice is provided by ICMR:

- The sample collection should be done using the recommended Personal Protective Equipment (PPE).
- These sites should be disinfected regularly as per recommended procedures.
- All recommended biosafety and biosecurity precautions should be implemented.
- Sample transport to the nearest COVID-19 testing laboratory should be ensured under proper cold-chain conditions and with triple layered packing.

https://icmr.nic.in/sites/default/files/upload_documents/Advisory_on_sample_collection_strategies.pdf

CURRENT TESTING STRATEGY:

Whom to test

A. All Symptomatic people who:

1. Have history of international travel in the last 14 days,
2. Had come in contact with laboratory confirmed case,
3. Are health care personnel.
4. Are hospitalized patients with Severe Acute Respiratory Illness (SARI) or Influenza like Illness (ILI) or severe pneumonia.

B. Asymptomatic direct and high-risk contacts of a confirmed case should be tested once between day 5 and day 14 of coming in his/her contact:

- a. Those living in the same household with a confirmed case,
- b. Health Care worker who examined a confirmed case without adequate protection as per WHO recommendations.

C. In hotspot/ cluster (as per Mo HFW) and in large migrations/ gatherings/ evacuees centres

All symptomatic with ILI (fever, cough, sore throat. Runny nose)

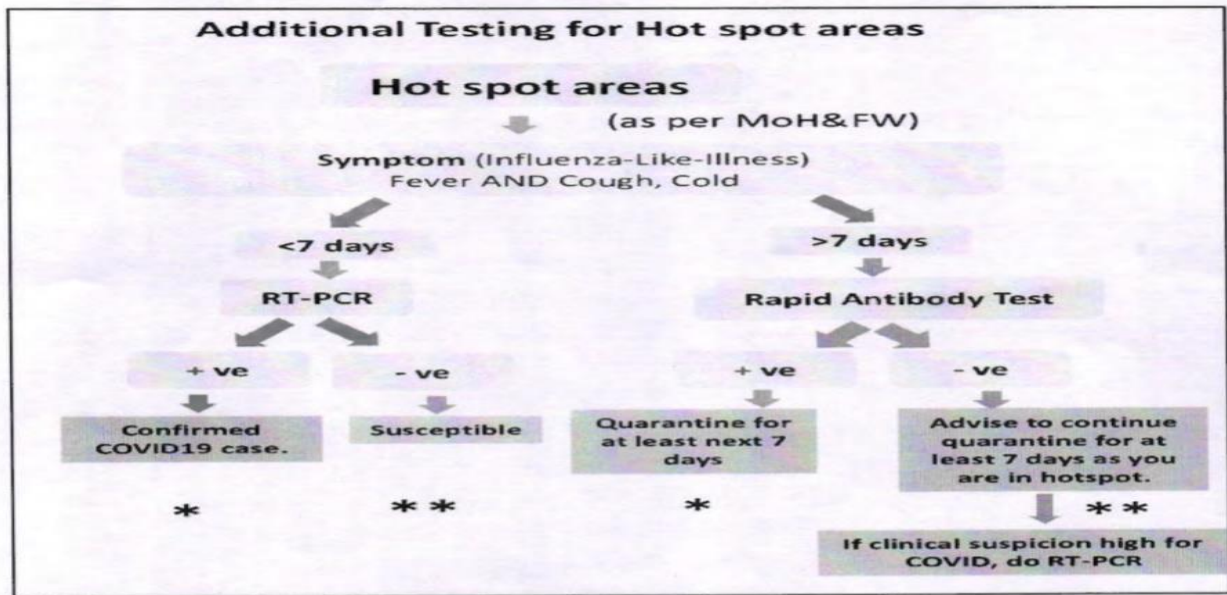
- a) Within 7 days of illness – rRT-PCR.
- b) After 7 days of illness- Antibody test (if negative, confirm by rRT-PCR.)

COVID-19 Testing Strategy for India (Recommended for the entire country)

Real-Time PCR (RT-PCR) test and Point-of-Care molecular diagnostic assays are recommended for diagnosis of COVID-19 among individuals belonging to the following categories:

- All symptomatic individuals who have undertaken international travel in the last 14 days
- All symptomatic contacts of laboratory confirmed cases
- All symptomatic health care workers
- All patients with Severe Acute Respiratory Illness (fever AND cough and/or shortness of breath)
- Asymptomatic direct and high-risk contacts of a confirmed case should be tested once between day 5 and day 14 of coming in his/her contact

B. Additional (in addition to A) Testing recommended in hot spots



https://icmr.nic.in/sites/default/files/upload_documents/Rapid_Antibody_test_Protocol.pdf

CLINICAL PRESENTATION & MANAGEMENT



Clinical presentation – Upper respiratory infection appears to be most frequent manifestation characterized primarily by –

- Fever
- Cough
- Fatigue
- Anorexia
- Other manifestation are
 - Shortness of breath
 - Sputum production
 - Myalgia

There is no specific clinical feature that can yet reliably distinguish COVID-19 from other viral respiratory infections, although development of dyspnoea several days after the onset of initial symptom is suggestive.

- Skin manifestations: Urticarial eruptions and transient livedo reticularis. Reddish-purple nodules on the distal digits similar in appearance to pernio (chilblains) have also been anecdotally described in children and young adult.

However, fever is not a universal finding on presentation

Other complications includes

- Arrhythmia
- Acute cardiac injury
- Shock
- Cardiomyopathy
- Thromboembolic complications including pulmonary embolism
- Acute stroke
- LGBS

Some patients with severe COVID-19 have laboratory evidence of an exuberant inflammatory response, similar to cytokine release syndrome with persistent fever, elevated inflammatory markers (e.g. D-dimer, ferritin), and elevated pro-inflammatory cytokines; these laboratory abnormalities have been associated with critical and fatal illness.

Time to recover

According to the WHO, recovery time appears to be around two weeks for mild infection and three to six weeks for severe disease.

INVESTIGATIONS

Hospitalized patients with documented or suspected COVID-19 is to be evaluated for features associated with severe illness and identify organ dysfunction or other comorbidities that could complicate therapy.

- Complete blood count (CBC) -with a focus on the trend of total lymphocyte counts.
- Complete metabolic panel
- Creatine kinase (CK)
- C-reactive protein (CRP)
- Ferritin
- Prothrombin time (PT)/partial prothrombin time (PTT)/fibrinogen level
- D-dimer
- Lactate dehydrogenase -repeat daily if elevated
- Troponin -repeat every two to three days if elevated
- Electrocardiogram (ECG), with at least one repeat test after starting any QTc-prolonging agent.

Other investigations includes:

- Hepatitis B virus serology
- Hepatitis C virus serology
- HIV antigen/antibody testing
- Chest radiograph
- Blood culture
- Sputum- Gram stain and culture
- Procalcitonin can be checked to assess the risk of secondary bacterial infection.

Common laboratory findings among hospitalized patients with COVID-19 includes:

- Lymphopenia- count <1500/microl
- Elevated aminotransaminase levelElevated inflammatory markers (eg, ferritin, C-reactive protein, and erythrocyte sedimentation rate)

Imaging Findings Chest radiographs may be normal in early or mild disease.

Common Chest CT findings in patients with COVID-19

| Suggestive | Non suggestive |
|---|-------------------------------|
| B/l airspace opacities patchy or diffuse multifocal | Unilateral upper lobe disease |
| Lower lobe involvement | Miliary shadows |
| Peripheral involvement | Pleural effusion |
| Pneumothorax | Cavities / pulmonary nodules |
| Fibrosis | Lymphadenopathy |

CT findings may be characteristic of COVID-19 but are not confirmatory of COVID-19

Less common findings include pleural thickening, pleural effusion, and lymphadenopathy.

Treatment:

Approach to hospital management is based on limited data and is evolving. Clinicians should consult their hospital protocol and Guidelines issued by ministry of health, government of India, NCDC and Department of health government of Himachal Pradesh.

TREATMENT PROTOCOL FOR ADULT PATIENT



The treatment protocol for the COVID Suspect adult patient depending upon the severity of illness are as follow:-.

1. Mild illness:

- Isolate patients at COVID centres.
- Droplet & contact precautions
- Symptomatic treatment.

2. Moderate Illness:

- Oxygen support.
- Start empirical antibiotics as per guidelines
- Consider starting HCQ 400mg BID x one day followed by 400mg OD x 4days.
- **Azithromycin** 500mg OD x 5 days (Given in many centres). Be cautious when you add it with HCQ (QTc prolongation)
- **Oseltamivir** 75 mg BID x 5days (If H1N1/Swine flu is predominant in your locality)

3. Severe Illness:

- **Initiate/continue** the treatment plan for moderate illness.
- **High flow O2 support** (HFNC/NIV) taking adequate precautions to reduce aerosol generation.
- **Awake proning** can be tried as a rescue measure
- **Anti-virals** can be initiated on a compassionate basis. No proven benefit (Better to start before clinical deterioration)
- Options available: Lopinavir/ Ritonavir, Darunavir/Cobicistat, Darunavir/Ritonavir, Atazanavir, Remdesivir.

- **Anticoagulation:** Prophylactic dose of Low molecular weight heparin (LMWH).

4. Critical Illness:

- Use carefully these drugs in patients with multi-organ damage.
- **Tocilizumab** can be considered for COVID-19 patients with persistent fever, elevated inflammatory markers, and signs of cytokine release syndrome or macrophage activation syndrome. (Check IL-6 level prior to starting Tocilizumab).
- **Convalescent plasma** (Preliminary trials: shown to improve symptoms, PaO₂/FiO₂, SOFA score and reduce viral load).
- Continue IV antibiotics and supportive care.
- Rule out ventilator associated pneumonia/ catheter related infections and other secondary bacterial/viral/ fungal infections.
- Always keep in mind to rule out differentials of non – resolving pneumonia.
- **In ventilated patients:** follow ARDS protocol strategy.
- Consider Prone ventilation/ECMO if need arises.
- **IV steroids:** Not indicated. Use only in case of refractory shock (not responding to inotropes) & macrophage activation syndrome.
- **Anticoagulation:** Therapeutic dose of LMWH (if not at high risk of bleeding).
- Refractory or progressive cases in ICU: **Interferon beta B1** can be considered. However it should be combined with an anti-viral (Lopinavir/Ritonavir) and hydroxychloroquine.

CRITICAL CARE GUIDELINES FOR COVID 19



General Principles for ICU care

- Identify patients with severe respiratory distress; or $SpO_2 \leq 93\%$ on room air for early referral after initiating oxygen therapy at 5 L/min and titrate flow rates to reach target $SpO_2 \geq 90\%$ in non-pregnant adults and $SpO_2 \geq 92-95\%$ in pregnant patients.
- Intubated non shift able patient should be put on ventilator as per ARDS protocol.
- Implement mechanical ventilation using lower tidal volumes (4–8 ml/kg predicted body weight, PBW) and lower inspiratory pressures (plateau pressure <30 cmH₂O).
- Hypercapnia is permitted if meeting the pH goal of 7.30- 7.45.
- The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets.
- In patients with moderate or severe ARDS, higher PEEP is suggested.
- PEEP titration requires consideration of benefits vs. risks (end-inspiratory over distension leading to lung injury and higher pulmonary vascular resistance).
- Use a conservative fluid management strategy for ARDS patients because aggressive fluid resuscitation may worsen oxygenation.
- In severe ARDS, prone ventilation for >12 hours per day is recommended.
- Routine use of systemic corticosteroids to be discouraged.

Acute Respiratory Distress Syndrome

Onset: New or worsening respiratory symptoms within one week of known clinical insult.

Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by effusions, lobar or lung collapse or nodules.

Origin of oedema: Respiratory failure not fully explained by cardiac failure or fluid overload.

Oxygenation (adults):

Mild ARDS:

PaO₂/FiO₂ - ≤ 300 mm Hg and ≥ 200 mmHg (PEEP or CPAP ≥ 5 cm H₂O, or non-ventilated)

Moderate ARDS

PaO₂/FiO₂ - ≤ 200 mm Hg and ≥ 100 mmHg with PEEP ≥ 5 cm H₂O, or non-ventilated)

Severe ARDS

PaO₂/FiO₂ - ≤ 100 mmHg with PEEP ≥ 5 cm H₂O, or non-ventilated)

When PaO₂ is not available, SpO₂/FiO₂ ≤ 315 suggests ARDS (including in non-ventilated patients)

Sepsis

Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia.

Life-threatening organ dysfunction caused by a deregulated host response to suspected or proven infection.

Septic Shock

Persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level < 2 mmol/L

PEDL~~A~~TRIC COVID -19



=====

Few cases of COVID -19 caused by SRS-CoV-2 infections have been reported in children compared to the total number of cases in general population. Majority of cases were thought to be due to household transmission and some were hospital acquired. Co infection with other respiratory pathogens has been described. Death in children have been reported in critical illness, the overall case fatality rate was 2.3% and among the critical illness, the case fatality rate was 49%. Among the children in China severity was lower with 94% having asymptomatic, mild or moderate disease, 5% having severe disease and <1% having critical disease. Very few cases of death have been reported in children.

Clinical course of disease.

Incubation period for COVID-19 extends up to 14 days with mean time of 4-5 days from exposure to symptom onset. Signs and symptoms of illness vary at onset but over the course of disease most children experiences the following:-

- Fever
- Cough
- Fatigue
- Anorexia
- Shortness of breath
- Sputum production
- Myalgia

Atypical presentation is seen in children with medical comorbidities. Symptoms like headache, confusion, rhinorrhoea, sore throat, haemostasis, vomiting and diarrhoea have been reported.

Illness severity.

Severity of illness vary from asymptomatic/ mild to severe. The pattern of severity is as follow:

- Mild to moderate (mild symptoms up to mild pneumonia) - 81%.
- Severe (dyspnoea, hypoxia, or > 50% lung involvement on CXR) - 14%.
- Critical illness (respiratory failure, shock, or multi organ failure.) - 5%

Basic Workup

Detailed history of signs, symptoms and the progression chronology should be obtained. Medical history of underlying comorbid condition should be obtained in order to classify in high risk and no risk groups.

Diagnostic tests

1. Detection of SARS –CoV-2 RNA by RT-PCR– detection is better in nasopharyngeal sample compared to throat sample. (Lower respiratory sample have better yield than upper respiratory samples.)
2. SARS –CoV-2 RNA has also been identified in stool and blood.
3. Detection of SARS –CoV-2 RNA in blood may be a marker of severe disease.

Laboratory investigation

- Base line investigation: CBC, CRP, S. Ferritin, Procalcitonin , SGOT, SGPT, Creatinine phosphokinase, LDH, Blood culture, D –dimer. Random blood glucose.
- In severe cases: Coagulation functions, base line ECG, Myocardial enzyme spectrum, blood gas analysis, serum electrolytes.

Lymphopenia is found in 83% of hospitalized children, **lymphopenia, neutropenia, elevated SGOT , SGPT, LDH, high CRP and high Ferritin levels may be associated with greater**

illness severity. Elevated D dimer and lymphopenia have been associated with greater morbidity and mortality. Critical illness have high inflammatory markers.

Radiological Investigations

- Chest X ray – shows patchy infiltrate consistent with viral pneumonia, though may be unremarkable early in the disease.
- Chest CT images- typically demonstrate bilateral peripheral nodular ground glass opacities. This CT imaging pattern is non-specific and overlap with other infections.

Chest radiograph or CT alone are not recommended for the diagnosis of COVID-19.

Management of Covid-19 Positive Pediatric Patient

WHO recommends that **all laboratory confirmed case be isolated and cared for in healthcare facility.** The decision to monitor a patient in the inpatient or outpatient setting should be made on case to case basis depending upon the clinical presentation, requirement of supportive staff, potential risk factors for severe disease and ability of the parents to isolate the child at home.

Triaging for the home based care or basic level health facility

- Lymphocyte count > 1100/ μ L
- Neutrophil / Lymphocyte ratio<3
- No thrombocytopenia.
- CRP< 60 mg/ L
- Normal CXR

1. ASYMPTOMATIC/MILD ILLNESS/ UNCOMPLICATED UPPER RESPIRATORY TRACT VIRAL INFECTION (Absence of viral pneumonia and hypoxia.)

With symptoms such as fever, fatigue, cough (with or without sputum production) anorexia, malaise, muscle pain, sore throat, dyspnoea, nasal congestion or headache. May also have diarrhoea, nausea and vomiting.

Treatment

These patients may not initially require hospitalization and will be able to manage at home.

With the supportive treatment as follow.

1. Bed rest.
2. Adequate calories (Nutrition).
3. Adequate hydration.
4. Supportive treatment.
5. Antipyretics -Paracetamol 10 -15 mg / kg / dose SOS / 6 hourly

(Preparations of Paracetamol (125 mg/ 5 ml and 250 mg /5 ml)

2. MILD SYMPTOMATIC CHILDREN.

Child with non-severe pneumonia having cough or difficulty in breathing / fast breathing (respiratory rate RR- 2 months > 60 / minute, 2-11 months – RR > 50 / minute, 1-5 years RR > 40 /minutes with no signs of severe pneumonia such as chest in-drawing, cyanosis, use of accessory muscles, lethargy, hypotension).

Treatment

These patients can be isolated and managed either in the hospital or non-traditional facility / secondary quarantine facility with adequate basic health facilities and medical staff. With the supportive treatment and antibiotics if bacterial pneumonia suspected

1. Bed rest.
2. Adequate calories (Nutrition).

3. Adequate hydration.
4. Supportive treatment.
5. Antipyretics- Paracetamol 10 -15 mg / kg / dose SOS / 6 hourly

(Preparations of Paracetamol (125 mg/ 5 ml and 250 mg /5 ml)

6. Antibiotics if bacterial pneumonia suspected.

1. Oral antibiotics

- a. Amoxicillin (30 – 40 mg / kg/ d) TID for 5 days OR
- b. Amoxicillin + clavulanic acid (20 – 40 mg / kg / day of amoxicillin) PO BID
or TID for 5 days OR
- c. Cefpodoxime (10 mg / kg / d) 2 divided doses for 5 days.

If suspecting atypical pneumonia add

- d. Azithromycin – 10 mg / kg / dose – single dose for day one

F/B - 5 mg/ kg / dose once a day for next four days.

Discharge criteria-

1. For mild symptomatic cases-On resolution of symptoms – with two samples negative for COVID -19 at least 24 hours apart.
2. Asymptomatic - two samples negative for COVID -19 at least 24 hours apart between 7 – 10 days.

Referral Criteria – to tertiary isolation facility-

If child progress to ARDS/ Septic shock severe pneumonia.

Severe pneumonia -Cough or breathing difficulty plus at least one of the following:

1. Central cyanosis or Spo₂ < 90% with chest in-drawing.

2. Severe respiratory distress (Use of accessory muscles, chest in drawing, nasal flaring, head bobbing).
3. Signs of pneumonia with any of the following danger signs.
 - a. Inability to breast feed or drink.
 - b. Lethargy or unconsciousness or convulsion.

3. SEVERE COVID ILLNESS

2-6 % of the all COVID -19 positive children have severe illness and require intensive care management.

Severe acute respiratory illness (SARI) includes.

- Acute respiratory distress syndrome (ARDS).
- Septic shock.
- Myocardial dysfunctions.
- Acute kidney injury.
- Other organ dysfunctions.

These patients require admission to pediatric intensive care units (PICU). Intensive care procedures like, mechanical ventilation, renal replacement therapy (RRT), extracorporeal membrane oxygenation(ECHMO) pose a significant risk of transmission to health care worker and other patients, so strict infection control practices are essential to prevent the spread through fomites, contact, droplets and aerosol.

Pediatric intensive care management of COVID 19 positive children.

- Children with SARI should be managed separately from other ICU patients.
- Suspect and confirmed cases should have separate designated area.

- Negative pressure isolation rooms with intensive monitoring tools are recommended, if unavailable, single rooms with exhaust fans are preferred.

MANAGEMENT OF SARI

Definition of SARI

Child presenting with cough and breathing difficulty or tachypnea with one of the following:

- I. Hypoxemia [oxygen saturation (<90%.Spo2) or central cyanosis.]
- II. Severe chest in drawing or grunting.
- III. Danger signs like altered sensorium, poor feeding, and convulsions as per the WHO definition of severe pneumonia.

Respiratory support

Respiratory support can be provided by various modalities which are as follow:

I. *Low flow oxygen delivery device-*

- a. Nasal prongs oxygen is the **initial choice** with the target Spo2 of < 95%.
- b. To minimise the Droplet transmission-
 - i. A **surgical mask can be placed** over the nasal prongs in older children.
 - ii. **Oxygen hood can be placed** over the nasal prongs in case of infants.
 - iii. **Nebulization should be avoided** – in case of air way obstruction like asthma
MDI (metered dose inhaler) are preferred.

II. Heated *high flow nasal cannula (HHFNC/HFNC).*

Should be avoided as it is found to be associated with aerosol generation due to higher flow rate and leak.

III. *Non-invasive ventilation (NIV)*

- a. Use of NIV is **discouraged in children** unless full aerosol precaution and negative pressure room is available.
- b. In children finding appropriate fit interface and maintaining seal without sedation is difficult.
- c. Various interface like nasal mask, oro-nasal mask and helmets have been tried in adult but they are associated with the aerosol generation and adequate seal cannot be maintained.

IV. *Invasive mechanical ventilation.*

- a. In case of **non-improvement or worsening of patient on nasal prongs.**
- b. **Early elective intubation is preferred** – to avoid risk involved in emergency intubation.
- c. **Intubation** has to be done by most experienced team member using Rapid Sequence Intubation (RIS) with a few modification.
- d. Mechanical ventilation strategies are same as for (PARDS) Pediatric Acute Respiratory Distress Syndrome.

These includes-

- Saturation targets
 - i. For moderate PARDS - 92-95%.
 - ii. For severe PARDS-88-92%.
- Tidal volume – Low TV ventilation.
 - i. For Good compliance- TV- 6-8 ml/kg, PEEP 7-10 cm of H₂ O.
 - ii. For Poor compliance- TV- 4-6 ml/kg, PEEP 10-15 cm of H₂ O. Limt. Plateau pressure < 28 cm of H₂ O
- Conservative fluid –restrict fluid maintenance to 60 -70 %

- Liberal Sedo-analgesia- Target comfort B score of 11-17.
- Neuromuscular Blockers- continuous infusion of NMB if asynchrony, requiring deep sedation.
- Steroids – should be avoided as they increase the risk of virus shedding.
- Prone ventilation – have high risk of infection spread due to the requirement of more staff and ventilation disconnection.

e. Closed suction is preferred –to avoid disconnection, aerosol production and de-recruitment.

f. Extubation should be planned once the team is sure that child will tolerate extubation. And should be done in controlled setting and directly to nasal prongs avoid NIV as it is associated with high aerosol generation.

Shock management

- Restricted crystalloid fluid bolus is recommended (10 -20 ml/kg of 0.9% saline solution.
- In vasoactive drugs -Adrenaline infusion is the first choice.

Myocarditis

- Diuretics, Inodilator, and ECHMO have been recommended.
- Immunomodulator – (IVIG) Intravenous immunoglobulin may be considered.

Acute Kidney injury

- Conservative measures like anuric fluid regime and trial of diuretics
- On failure of conservative regime – RRT like, (PD) peritoneal dialysis (HD) Haemodialysis or continuous replacement therapy (CRRT) are recommended.

Acute liver failure coagulopathy and DIC

- Managed conservatively with blood component therapy as necessary.

Cytokine release syndrome

- Characterized by severe inflammation with hyperferritinemia, high C- reactive protein and high interleukin-6 (IL-6) level which is likely to respond to Tocilizumab.

Supportive care

- Early enteral nutrition should be started within 24 hours and full feed established by 48 hours if no contraindication.
- Blood transfusion should be done in case of stable hemodynamic and oxygenation with patients haemoglobin > 7 gm. / DL and in refractory hypoxemia or unstable hemodynamic the trigger of transfusion would be < 10 g/ dL.
- Antibiotics - co infection with other virus and bacteria have been observed within 72 hour of ICU admission. Start higher antibiotics depending upon severity (moderate to severe cases).
 - **IV Ceftriaxone** (50 mg/ kg /day in two divided doses) and
 - Anti- staphylococcal cover with **Cloxacillin** 50 -100 mg/kg /day IV or orally
 - Plus + **Azithromycin** IV 10 mg / kg.
 - **Neuraminidase inhibitor / Oseltamivir**
 - < 3 Months -12 mg BD, 3-5 months -20 mg BD, 6-11months-25 mg BD on wt. basis- <15 kg- 30 mg BD , 15- 23 kg-45 mg BD, 23- 40kg -60 mg BD, > 40 kg 75 mg BD for 5 days de-escalate the treatment on the basis of culture and PCR report.

Specific therapy:

No current evidence from RCT- so no specific antiviral treatment recommended for COVID-19 confirmed patients

Should ONLY be used with proper informed expressed consent on case to case basis.

- Hydroxy chloroquine -6.5 mg / kg BD for day 1 F/B 3.25 mg BD for 4 days
- Lopinavir/ Ritonavir

7- 15 kg- 12 mg / kg of Lopinavir + 3 mg /kg ritonavir

15-40 kg- 10 mg / kg of Lopinavir + 2.5mg /kg ritonavir

12 years - 400 mg Lopinavir + 100 mg ritonavir

-with food twice daily for 10 days.)

Resuscitation:

- Cardiac arrest requiring cardiopulmonary resuscitation (CPR) poses high risk of aerosol generation.
- Two person alternately for chest compression and handling airway and one nurse for medication should enter the room after wearing full PPE (personal protection equipment) and close the room.
- Preferably leave the patient connected to ventilator as it provide the closed circuit.
- Increase FiO₂ to 100%, ventilator rate to 10 breath per minute, tidal volume to 6 ml/ kg on pressure control ventilation.
- If airway not in place minimise the aerosol by complete seal of face mask and other person to prepare for intubation.
- A supraglottic devices like LMA may be used during resuscitation.

Course and progression

- Respiratory failure occurs around day 7 of onset of symptoms with peak severity at day 10. Recovery start by about day 14.

NEWBORN MANAGEMENT



BACKGROUND

If it is known that COVID-19 is transmitted through inhalation and fomites on touching the face and eye with the respiratory secretions via droplets on coughing and sneezing. Virus has been found in the blood and in the feces but in the lower quantity. There is no data of adequate statistical power that describe which maternal, intra-partum, and neonatal factors influence perinatal transmission of COVID-19 apart from some information currently available so a considerable uncertainty exists regarding the potential of vertical transmission.

NEONATAL MANAGEMENT RECOMMENDATIONS

Neonates born to women with COVID-19 suspect – as well as neonates born to women with testing for COVID-19 pending at the time of delivery - should be considered as persons under investigation (PUIs) for infection.

Following steps should be taken

A. General Measures:

1. Droplet and Contact Precautions

B. Delivery Room Management of Neonates

1. Paediatrician should attend deliveries based on their normal centre specific policies; **maternal COVID-19 alone is not an indication to do so.**
2. New born resuscitations as per the standard NRP guidelines in a designated area separated from mother at least with screen.

3. If Paediatrician are needed to perform infant stabilization, the responding clinicians should use Airborne, Droplet, and Contact Precautions-level PPE, given both the increased likelihood of maternal virus aerosols and the potential need to intubate, perform airway suctioning, and initiate positive pressure ventilation, all of which may generate infant aerosols

C. Maternal and newborn separation:

1. Temporary separation of mother and newborn will minimize the risk of postnatal infant infection from maternal respiratory secretions.
2. Benefits of temporary maternal and newborn separation at birth for decreasing the risk of newborn infection should be discussed with the mother, optimally prior to delivery.
3. The benefits of separation may be greater in mothers with more serious illness.

D. Newborn admission:

Newborn can be managed separately as well in the same isolate room of mother with the following precautions:

a).Mother room-in with her infant

1. If mother chooses / centre does not have the capability of caring for the infant in a separate area.
2. Infant should remain at least 6 feet from mother at all times.
3. Breast milk feeding per the feeding recommendations.
4. If the mother also requests skin-to-skin contact with her infant, including direct breastfeeding, she should comply with strict preventive precautions, including the use of mask and meticulous breast and hand hygiene
5. Use an air temperature-controlled isolate using a physical barrier such as a curtain between the mother and infant.

b).Separate form mother

1. **Well-appearing** neonates may be admitted to specific areas physically separate from newborns unaffected by maternal COVID-19.
2. Newborns should be bathed as soon as reasonably possible after birth.
3. Clinical staff should use Droplet and Contact Precautions until newborn virologic status is known.
4. **Infants born requiring neonatal intensive** care optimally should be admitted to a single patient room with the potential for negative room pressure (or other air filtration systems.)
5. Should be maintained at least 6 feet apart and/or placed in air temperature-controlled isolettes
6. Airborne, Droplet, and Contact Precautions and negative room pressure should be used for the care of infants requiring CPAP or any form of mechanical ventilation.

E. Breast milk feeding

No study to date has demonstrated the presence of SARS-CoV-2 in breast milk.

1. Mothers may express breast milk (after appropriate breast and hand hygiene) and this milk may be fed to the infant by designated caregivers.
2. Promoting breast milk feeding and supporting establishment of maternal milk supply may offer additional benefits to well and sick newborns.

F. Newborn viral testing

The optimal timing and extent of testing is currently unknown.

1. Infants born to mothers with COVID-19 should be tested for SARS-CoV-2 at 24 hours and, if still in the birth facility, at 48 hours after birth
2. For infants who require ongoing hospital care, centres may transition to the use of universal precautions if two tests obtained at least 24 hours apart are negative

3. For infants who are positive on their initial PCR testing, follow-up testing of combined specimens from the throat and nasopharynx should be done at 48-72 hour intervals until two consecutive negative tests.

G. Newborn birth hospital discharge

1. Infants determined to be infected by molecular testing
 - (or whose status cannot be determined due to lack of testing), but with no symptoms of COVID-19, may be discharged home on a case-by-case basisUninfected individuals >60 years of age and those with comorbid conditions should not provide care if possible.
2. Infants with negative SARS-CoV-2 molecular testing
 - Should optimally be discharged to the care of a designated healthy (non-infected) caregiver.
3. A mother with COVID-19
 - Advised to maintain a distance of at least 6 feet from the newborn, and when in closer proximity use a mask and hand-hygiene for newborn care until (a) she is afebrile for 72 hours without use of antipyretics, and (b) at least 7 days have passed since symptoms first appeared.
4. A mother with COVID-19 whose newborn requires ongoing hospital care
 - Should maintain separation until (a) she is afebrile for 72 hours without use of antipyretics, and (b) her respiratory symptoms are improved, and (c) negative results are obtained from at least two consecutive SARS-CoV-2 nasopharyngeal swab tests collected ≥ 24 hours apart.

Management of Neonate with Covid suspect/ Covid positive mother

Separate room
with healthy
caretaker

Same room with Mother

- Separate bed of Newborn - 6 feet apart with screen in between.

If mother positive for COVID -19

Test new born with RT-
for COVID-19 of at 24 to

Negative

Discharge to healthy
caretaker

Positive

Asymptomatic
Home isolation/ or
Institutional isolation

IMMUNIZATIONS



Advisory committee on vaccine and immunization practices (ACVIP) guidelines on immunizations during COVID 19 pandemic

Immunizations during a Pandemic

Immunizations should be continued during COVID 19 Pandemic as immunization is an essential health activity.

Risk associated with Immunizations during a Pandemic

There is **no documented risk of immunizing a well-child during the COVID 19 Pandemic.** Monitor strictly for any increased (AEFI) adverse event following immunization.

General instructions for vaccination clinics

1. It is strongly recommended to have exclusive vaccination sessions and exclusive vaccination rooms.
2. It is essential to perform triaging of patients and segregate those with fever and respiratory symptoms.
3. It is essential to screen accompanying individuals for fever and respiratory symptoms.
4. Any caretaker having cough, cold or fever should be barred from entering the healthcare facility.
5. Senior citizens (more than 60 yrs. of age) should be requested **not** to accompany the vaccinee.

6. Only 1-2 caretakers should be permitted with each child.
7. All caretakers and children except infants should wear a mask.
8. It is essential to maintain social distancing at all times.
9. It is essential to maintain aggressive infection control measure in the clinic/office.
10. Utilize every healthcare visit for immunization, provided there are no precautions/contraindications and the interval between vaccines are maintained as per published guidelines.
11. It is essential that the doctor and supporting staff utilize adequate PPE. In a vaccination clinic, a surgical mask and gloves are necessary along with scrupulous hand hygiene.

Prioritizing Vaccines in routine immunization

- Prioritize primary vaccination series: ***DPT, Hep B, Hib, OPV/IPV, and Rotavirus vaccines, PCV, Influenza, Varicella and MR/MMR*** avoid postponing these vaccines.
- Prioritize pneumococcal and Influenza vaccine to vulnerable groups. Healthcare personnel should be up to date in their age appropriate vaccinations.
- **Typhoid conjugate** vaccines may be **clubbed with the influenza** vaccine at 6 months or MR/MMR at 9 months.
- **Hepatitis A vaccines and HPV vaccines may be postponed** to a later date if logistic issues of transport etc. exist. They may be administered after the priority vaccines have been given.
- **Multiple vaccines can be administered in the same session** without fear of any increased adverse effects.
- **Boosters may be postponed** to a later date, if logistic issues of transport etc. exist.
- If a child is in a healthcare facility for any reason, this opportunity should be utilized for administering any eligible vaccine.

Mass immunization activities

In view of social distancing measures all Mass Vaccination Campaigns **may be postponed**.

Catch Up vaccination

The vaccine provider should track cohorts of children who have missed the vaccine and immunize them **when conditions become favourable**. If a child is in a healthcare facility for any reason and eligible for immunization utilize this opportunity for administering any eligible vaccine.

Important- Children from homes where COVID 19 confirmed or suspected are present, should be immunized only after the quarantine period is over.

ANAESTHESIA



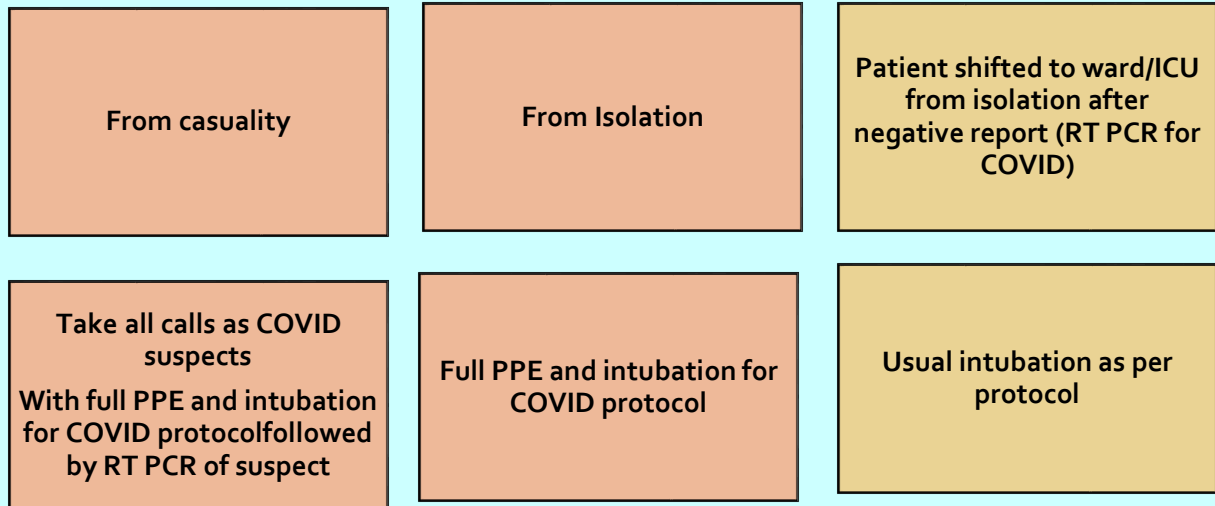
Pre anaesthesia Check-up

No elective surgeries are being undertaken so no PAC of routine cases.

- **Emergency surgeries and orthopaedic** trauma cases are taken up as per following protocol.
 - Minimum staff to be kept inside OT.
 - PAC of emergency cases to be done before taking the patient to OT.
 - Rest of the PAC done as per already existing protocol.
- **In case of a suspect/confirmed COVID** case presenting with **life threatening/limb threatening emergency** in which either patient is non shift able or shifting time poses a threat to patient's life or limb.
 - Will be taken up in OT 2 with full PPE and precautions.
 - This will be followed by surface decontamination and fumigation of OT and common corridor as well and all other pending cases will be halted for next 4 hours.
 - Entire staff working in OT to wear compulsory gown over OT dress, face mask and face shield, gloves to be disposed off in the OT before leaving.
 - The entire OT team will be quarantined as per the protocol for suspect / confirmed cases.
- Pain clinic
 - Presently no new cases are being taken up, but old patients with pending Epidural steroid injections can be entertained after clearance from flu clinic.

Intubation of COVID -19 patient

- Intubation call to be sent to resident on duty and OT technician on duty.



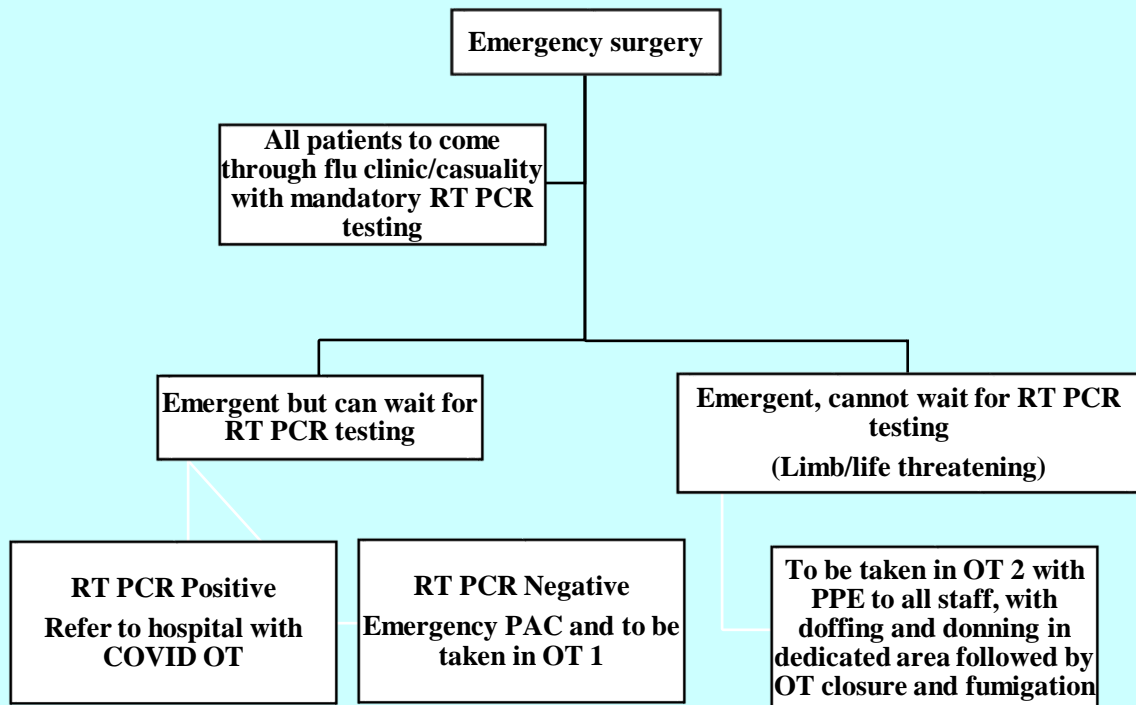
Intubation preparedness:

- Two emergency kits with all emergency airway equipment/ drugs and plastic sheets and HME filters to be kept in isolation and one in OT for casualty call

Intubation technique:

- Entire team to use proper PPE as per protection protocol before proceeding for intubation.
- Pre-oxygenation for 3 to 5 minutes with 100% oxygen.
- Rapid sequence intubation with cricoid pressure
- Prefer giving muscle relaxants to decrease aerosol generation
- Video guided laryngoscopy preferred over direct laryngoscopy if available.
- Patient to be put on AMBU with HME filter and shifted to isolation or referred as per the hospital protocol for further management.

Flow chart of movement of surgical patient



MANAGEMENT OF SURGICAL PATIENTS



All elective surgical and endoscopic cases should be postponed at the current time.

Only emergency cases are to be taken.

Guiding Principles

1. The goal is to provide timely surgical care to patients presenting with urgent and emergent surgical conditions while optimizing patient care resources (e.g. hospital and intensive care unit beds, personal protective equipment, ventilators) and preserving the health of caregivers.
2. There is no substitute for sound surgical judgement.
3. Procedures and operations should be performed if delaying the procedure or operation is likely to prolong the hospital stay, increase the likelihood of later hospital admission, or cause harm to the patient.
4. Patients who have failed attempts at medical management of a surgical condition should be considered for surgery to decrease the future use of resources.
5. Multidisciplinary shared decisions regarding surgical scheduling should be made in the context of available institutional resources that will be variable and rapidly evolving.

Evaluation:

- There should be a separated OT complex for suspected patients designated as COVID-19 OT complex.

Surgical Decision Making:

- For patients who are known to be COVID-19 positive or at high clinical suspicion for COVID infection non-operative management is preferred, if feasible and safe for the patient.
- If operation is required in these patients then appropriate PPE should be utilized and precautions taken to protect the healthcare team.

Pre-op Safety Measures:

1. COVID-19 testing should be promptly performed and the patient moved to a PUI (patients under investigation/Isolation) unit if symptoms suggestive of infection are identified. (Depending on availability of test at Centre)
2. All suspected COVID-19 infection related precautions should be implemented by all members of the medical/surgical and nursing team.
3. In pre-operative setting - Patients scheduled to undergo any type of surgical intervention should be re-evaluated for surgical intervention within 24 hours of the scheduled intervention.
- 4 The latest serology results are to be communicated to the surgical team and to the patient and family once it is available.
- 5 Extra or impermeable personal protective equipment (PPE) and a good face shield are important.
- 6 For intubation and other anaesthesia practice , following point should be followed-
 - a. Minimum 1 Hour time gap to be given between two procedures/Surgeries- 30 minutes s for deep cleaning & 20 minutes for UV sterilization
 - b. Laminar flow / AC not to be started until intubation is done.

C. Intra-op Safety Measures:

- 1 The surgical procedure in a COVID 19 positive patient is to be taken up in the designated centre only.
- 2 If in case you come to know the patient operated is COVID 19 serology positive at a later date, inform the appropriate authority, self-isolate yourself and your team close the OT for appropriate period of time.
- 3 In case you need to operate a COVID 19 positive patient in a designated centre, a multidisciplinary discussion to re-evaluate surgical indication, appropriate treatment and ICU availability is desirable.

ORTHOPEDIC SURGERIES IN COVID 19



Intraoperative Considerations

- Minimize bleeding: use tourniquet/ tranexamic acid/ good haemostasis. as bloodier field generate higher aerosol.
- Use Cautery minimally/ low settings/ use smoke evacuators
- Avoid pulse lavages/high pressure lavages; do gentle lavages
- Avoid high power instrument: drills/ reamers/burr, prefer osteotomes, nibblers, manual reamers/do unreamed nailing.
- Avoid staged surgeries
- Use absorbable sutures
- Avoid bulky dressings wherever possible, use minimal visible dressings like opsite, tegaderm etc. which allows wound inspection from safe distance
- Use removable splints/ slabs instead of casts. Cast removal involves higher chances of patient contact

Post-Operative Considerations

- All PPE should be removed inside OT as per institutional/CDC guidelines
- Discard properly.
- Shift patient to recovery room/patient's room using shifting precautions.
- Minimise postop stay.
- Try for day care surgeries.
- Rehab program using videos and telemedicine.
- Minimal follow up visits give SOS phone numbers to patient to allay issues over phone

OPHTHALMOLOGY



OPD Cases -Consultation rooms:

1. All slit lamps to have plastic or acrylic sheets/ X-ray sheets attached and should be cleaned in every two hours.
2. Slit lamps to be cleaned twice a day.
3. Hands need to be cleaned with sanitizers once equipment has been touched by patient.
4. OPD trial frames and lenses to be cleaned every time refraction is performed.
5. Special handling of patients of conjunctivitis with gloves.
6. Open door policy to be maintained.
7. To stop direct ophthalmoscopy.

Precautions at ophthalmic evaluation and OPD procedures:

1. Slit lamp barriers and breathe shields.
2. Alcohol based sanitizers before and after examination of each patient.
3. Avoid syringing
4. Avoid NCT.
5. In case of patient of conjunctivitis the patient to be seen in designated room.
6. Optimise support staff and HCW allocation (one-third to half-staff per day)

Ophthalmic surgeries:

Appointments for Elective surgery

All elective surgeries to be postponed till favourable conditions.

Ophthalmic surgeries:

1. Emergency care will be provided and triage of the same will be done.
2. Urgency to be determined by Ophthalmologist's judgement and must take into consideration individual medical and social circumstances.

Preventive measures (general):

As per the hospital standard protocol

Outpatient department:

All the ophthalmic emergencies has to be attended like -

1. Chemical injuries
2. Blunt trauma or open globe injuries
3. Lid trauma
4. Angle closure glaucoma
5. Elevated intraocular pressure of more than 38 mm Hg
6. History of recent onset of vision loss (less than 2 weeks) i.e CRAO, CRVO, VH and RD
7. Retinal tears
8. Endophthalmitis
9. Severe inflammation – lid//orbit
10. Corneal abrasion
11. Foreign body
12. Conjunctivitis (rule out fever as this may require screening for COVID hence need to be managed accordingly)

Procedures and surgery:

1. Minor procedures and surgeries as required for treatment of emergency cases are to be done.
2. DCR to be avoided.
3. No routine AR or NCT for each patient to be done only if required by the doctor.

Precautions at surgery

1. All surgeries must be day care.
2. Choose the quickest possible surgical procedure.
3. Prefer topical anaesthesia over local anaesthesia.
4. PPE kit for all OT staff (HIV kit for non-COVID-19 patients and full body suits for COVID-19 patients and suspects.
5. All universal precautions to be followed.
6. Minimum number of staff in OT.

(Emergency case risking the vision or life should be taken up and decided by the department.)

OTORHINOLARYNGOLOGY



OPD Cases

- Patient with fever and symptom of URTI must wear mask.
- Must maintain one meter distance between 2 patients and b/w patient and healthcare provider in OPD.
- All aerosol generating procedures, like Indirect Laryngoscopy, Nasal endoscopy in OPD/Minor OT to be done with full PPE/HIV Kit. In present scenario these procedures should be done only if lifesaving or going to change course of treatment/diagnosis.
- Increasing evidence suggests that a lost sense of smell, known medically as anosmia, may be a symptom of COVID 19. So such history should be asked in all URTI cases. The American Academy of Otolaryngology–Head and Neck Surgery recommended that anosmia be added to the list of COVID 19 symptoms used to screen people for possible testing or self-isolation.

Management of ENT Emergencies

Epistaxis:

- Conservative treatment with nasal pressure and/or packing and control of comorbidities should be attended immediately.
- If epistaxis persists: bilateral anterior or posterior nasal packing with admission be done.
- Surgical Intervention to be avoided unless necessary.

Foreign bodies removal:

- All proper PPE and precautions should be taken if the procedure is done in the OPD setting.
- If the individual is particularly intolerant of manipulation, perform the removal under general anaesthesia,

Nasal bone fractures:

- In un-displaced fractures, treatment should be conservative.
- Intervention under general anaesthesia recommended only in case of a comminuted displaced fracture or a nasal septal haematoma.

Acute Mastoiditis

- Acute mastoiditis should be managed medically and if necessary by needle aspiration of the sub-periosteal abscess.
- CT scan to be done only if symptoms progress despite conservative management.

Neck abscess

- Infective neck masses should be managed as outpatients as far as it is possible.
- Progressively enlarging cervical or retropharyngeal purulent collections may require surgical treatment with full PPE in the OT.

Tracheostomy:

- Avoid if possible, especially if there is a reversible cause for airway obstruction.
- Avoid use of high flow oxygen.
- Full PPE according to the hospital guideline.

Peri-orbital abscess:

- Where the vision is at risk and conservative measures have failed, an external approach may be preferred over the Endoscopic approach.

Post-Surgical Care:

Due care to be taken while doing external dressings and nasal endoscopic suctioning.

Idiopathic facial paresis/palsy or sudden onset Sensorineural hearing loss or Meniere's disease:

The use of high dose oral steroids is not recommended to treat either Meniere's disease or Sudden Sensorineural Hearing Loss (SSNHL).

It is preferable to use intra-tympanic steroid to treat these conditions.

Steroid use should be discussed with the patient and informed consent obtained prior to starting and should be decided on a case-by-case basis.

OBSTETRICS & GYNAECOLOGY



Covid19 Suspect Pregnant Women

- Labour management- delivery or caesarean will be conducted by Covid19 emergency team on duty (Obstetrician and on duty staff nurse and if required on duty trained birth attendant for extra help).
- If result of suspect is awaited: delivery/ caesarean will be performed in the septic labor room/ dedicated operation theatre for COVID19 patients.
- If result comes out to be positive: COVID woman will be shifted to the COVID floor through predetermined route (RED channel).

Management of Covid19 positive-pregnant woman

- All COVID19 positive pregnant women will be admitted in the COVID floor.
- Labour management, delivery or caesarean will be conducted by Covid19 obstetric emergency team on duty.

Antepartum/ Intrapartum management of Covid19 suspect or positive patient

- Senior resident/ consultant to examine the patient.
- Use the standard precautions and PPE as per the protocol for COVID-19.
- Check her antenatal records.
- Check for any obstetric complication which requires urgent delivery.
- Abdominal examination must.
- P/V (per vagina examination) only if indicated
- Confirm that all necessary investigations have been done.

Intra-partum management

- Avoid oxytocin augmentation.
- Avoid early ARM.
- Administer broad spectrum antibiotics.
- Oxygen may be administered by appropriate device as per the standard protocol if symptoms of respiratory distress are present.

Caesarean indicated- in COVID-19 patient.

- LSCS to be performed by senior resident /consultant on duty. .
- Placenta to be sent for virological and histo-pathological examination.
- Lactation as per paediatrician advice.

DENTISTRY



GENERAL CONSIDERATIONS

1. All emergency dental treatment should be carried out after detailed dental and medical history of the patient.
2. All members of the dental team:
 - i. Should be trained and minimum exposure of members should be planned.
 - ii. Should follow a rotatory roster to avoid unnecessary exposure.
3. All dental equipment should be in proper condition along with adequate power back up for managing dental procedures.
4. Restrict the number of para-dental staff and patients who enter the clinical as well as waiting area of the clinics.

PERSONAL PROTECTION FOR DOCTOR AND STAFF:

1. Hand hygiene by the use of soap and water for washing with standard steps recommended by WHO or alcohol based hand rub.
2. Personal protective equipment is mandatory should be judiciously used and disposed as per the protocol:
 - a. Donning and doffing should be done as per the protocol in the designated area.
 - b. Goggles / face shield (Both to be used, fitting goggles with a soft tissue seal)
 - c. Triple layer surgical mask/ N95 respirator during routine dental procedures
 - d. Surgical mask to be changed after every dental procedure
 - e. FFP3 – Standard mask should be used during treatment of COVID19 positive patients
 - f. Surgical gloves to be changed after each procedure.

- g. Disposable coverall / gown with hood /waterproof lining (to be changed daily).
- h. Coverall / gown outer; maybe improvised but will need to be changed after each patient
 - i. Shoe covers to be changed daily.

3. All instruments

- i. Should be to be disinfected, cleaned and sterilized as per standard infection control (CDC, 2003)
- ii. Should be packaged in color changing sterilization autoclave pouches and properly storage.

4. Clean and disinfect doorknobs, light switches, cabinet handles, front desk area frequently with 70% Ethanol (Spirit) or Sodium Hypochlorite.

5. All biomedical should be carefully disposed as per the Bio-Medical Waste (Management and Handling) Rules.

PATIENT RISK CRITERIA

Low Risk - Patients under 60 years of age who have not had any COVID related symptoms in the past 14 days, no contact with COVID infected patients. *Most dental procedures can be performed.*

Moderate Risk - Patients over 60 years of age. Have recovered from a recent bout of fever, cold, cough in the past 14 days and are currently exhibiting no symptoms. *Dental procedures except aerosol producing procedures can be done until they move into a low-risk category.*

High risk - Patients of any age group who are suffering from the following symptoms these include, but not limited to:-

- a. Fever in excess of 100 degrees F in the past 14 days
- b. Sore throat
- c. Dry Cough

d. Malaise

or have come in contact with COVID infected patients.

Dental procedures should not be done on high risk patients until their general symptoms subside and they can be categorized into Low or Medium risk patients.

Dental emergencies

- Uncontrolled bleeding
- Cellulitis or a diffuse soft-tissue bacterial infection with intra-oral or extra-oral swelling that potentially compromising the patient's airway
- Trauma involving facial bones, potentially compromising the patient's airway

Dental urgencies

- Severe dental pain from pulpal inflammation
- Pericoronitis or third-molar pain
- Surgical post-operative osteitis, dry socket dressing changes.
- Abscess, or localized bacterial infection resulting in localized pain and swelling
- Tooth fracture resulting in pain or causing soft tissue trauma
- Dental trauma with avulsion/luxation
- Dental treatment required prior to critical medical procedures
- Final crown/bridge cementation if the temporary restoration is lost, broken or causing gingival irritation
- Biopsy of abnormal tissue

Non-urgent dental treatments that can be postponed

- Initial or periodic oral examinations and recall visits, including routine radiograph
- Routine dental cleaning and preventive therapies
- Orthodontic procedures other than those to address acute issues (e.g. pain, infection, trauma) or other issues critically necessary to prevent harm to the patient

- Extraction of asymptomatic teeth
- Restorative dentistry including treatment of asymptomatic carious lesions
- Aesthetic dental procedure

PROCEDURE BASED RECOMMENDATIONS

1. Aerosol generating procedures

- a. Restorative dentistry
- b. Oral Prophylaxis using Ultrasonic devices
- c. Implant Dentistry
- d. Fixed Prosthodontics
- e. Oral Surgical procedures where a high-speed hand piece is expected to be used

For the above procedures, the use of the following is mandatory

- a. Rubber Dam (wherever applicable)
- b. Hi-Vac Suction in conjunction with saliva ejector

2. Non-Aerosol generating procedures (possibility of saliva smear)

- a. Examination and Consultation
- b. Removable Prosthodontics
- c. Non-surgical Extractions
- d. Orthodontics
- e. Oral Prophylaxis using hand scalers
- f. Biopsies

DENTAL TREATMENT CONSIDERATIONS:

1. Carry out only emergency dental treatments in a single treatment room. Preferably designate separate clinical areas for screening, aerosol and non-aerosol control dental treatments.
2. Use 1.5% hydrogen peroxide or 0.2% povidine as a pre-procedural mouth rinse.

3. Wherever warranted, use extra oral dental radiographs such as panoramic radiographs as alternatives to intra oral radiographs as the latter can stimulate saliva secretion and coughing.
4. Reduce aerosol production as much as possible, and
 - i. Prioritize the use of hand instrumentation.
 - ii. Use rubber dams to minimize aerosol or spatter.
5. Use a 4-handed technique for controlling infection.
6. Most of the Dental care should be performed with the use of high-volume suction or saliva ejectors mainly in aerosol based procedures.
8. Minimize the use of a 3-in-1 syringe as this may create droplets due to forcible ejection of water/air.
9. Disinfection of Operatory Post Procedure:
 - i. All dental instruments must be sterilized with utmost care and as per protocol.
 - ii. The parts of the chair must be wiped down with 70% Ethanol (spirit) or Sodium Hypochlorite (taking care of the fact that it may affect upholstery).
 - iii. Countertops (marble/granite) may be wiped clean with a solution of 10g of Bleaching powder mixed in 1 litre of water.
 - iv. Wooden countertops (sunmica) maybe wiped clean with 70% Ethanol (Spirit).

LIST OF MUST-HAVE EQUIPMENTS IN THE DEPARTMENT

1. Class B Autoclave
2. Ultrasonic bath
3. Fumigation device
4. Air Purifiers with HEPA filter
5. High Vacuum suction

**DETAILED PLAN FOR USE OF PERSONAL PROTECTIVE EQUIPMENT
IN DENTAL DEPARTMENT.**

LEVEL 1: PRE-SCREENING AND TRIAGE AREA

LEVEL 2: NON-AEROSOL GENERATION PROCEDURES

LEVEL 3: AEROSOL GENERATION PROCEDURES

| Personal Protective Equipment | Level 1 | Triage Area | Level 2 | Non-aerosol Generation area | Level 3 | Aerosol Generation area |
|--------------------------------------|----------------|--------------------|----------------|------------------------------------|----------------|--------------------------------|
| Overall for Dental Personnel | √ | √ | √ | √ | √ | √ |
| Medical/Surgical Cap | √ | √ | √ | √ | √ | √ |
| Surgical Mask | √ | √ | √ | | | |
| N95 or High Level Respirators | | | | √ | √ | √ |
| Eye Shield | | √ | √ | √ | √ | √ |
| Surgical Gown | | √ | √ | √ | √ | √ |
| Surgical Gloves | √ | √ | √ | √ | √ | √ |
| Face shield | | | √ | √ | √ | √ |
| Disposable Shoe Cover | | | √ | √ | √ | √ |

Source: Zhang. W, Jiang. X. Front Oral Maxillofac Med 2020;2:4 <http://dx.doi.org/10.21037>

RADIOLAGNOSIS



-
- X-ray of all the suspected/ positive cases of COVID-19 will be done using a dedicated portable X-ray machine housed in the isolation area near the nursing counter.
 - All the requisition forms for the X-ray are to be sent to the technologist in charge.
 - The duty roster of the technologists-on-call will be regularly sent to the isolation area.
 - In order to judiciously use PPEs, try clubbing up of the X-rays of multiple patients in one particular call only.
 - The technologist should wear complete PPE.
 - After doing all the X-rays, the technologist should then proceed to doffing area and doff as per the standard protocols and discard the materials as per the instructions.

MORTALITY MANAGEMENT



-
- Exercise all universal precautions while handling a dead body.
 - Inform nodal officer.
 - Outer surface of the body bag and trolley carrying the body will be decontaminated before leaving the isolation ward.
 - Do not wash the body.
 - Minimal manipulation of the body
 - All the orifices should be plugged to prevent leakage.
 - Any cut or wound marks if any should be washed with 1% hypochlorite and firmly covered with gauze, cotton or leucoplast.
 - Body bag will be used for transferring body, packing should be done using full PPE and N-95 Masks. Plastic bag carrying the body should not be less than 150 micron
 - Do not open or unzip the body bag
 - Do not embalm the body
 - Opening bag and touching of body is not allowed
 - Wash hands immediately with liquid soap and water if accidentally have contact with blood or body fluids from the dead body.

DRRKGMC HAMIRPUR



STANDARD OPERATING PROCEDURES



AND RECOMMENDATIONS



GUIDELINES TO BE FOLLOWED ON DETECTION OF SUSPECT/CONFIRMED COVID-19 CASE IN A NON-COVID HEALTH FACILITY

These guidelines are intended for both

- (i) COVID-19 healthcare facilities (public and private) which are already receiving or preparing to receive suspected or confirmed COVID-19 patients as well as to.
- (ii) Non-COVID healthcare facilities.

A. Institutional arrangement

The Hospital Infection Control Committee (HICC) has well-defined composition, roles and responsibilities of implementing the guidelines

B. Responsibilities of HICC

This committee will be responsible for:-

- Establishing a mechanism for reporting of development of symptoms suggestive of COVID-19 in HCW.
- Surveillance for fever/cough/breathing difficulty through either self-reporting or active and passive screening at the beginning of their shift.
- Also monitor patients (who have been admitted for non-COVID illness) for development of unexplained fever/cough/breathing difficulty during their stay.
- Will ensure that
 - Existing IPC guidelines against such high risk situations must be audited, updated and reiterated to all HCW.
 - All IPC guidelines will be strictly adhered to and followed at all times.

- For hospitals located **in proximity/catering to COVID-19 containment zone/s** it might be **desirable to treat all patients as suspect COVID-19 case** until proven otherwise and exercise standard care.
- Whenever a non-COVID patient or any healthcare workers is suspected to have COVID like symptoms/tests positive for COVID-19, the HICC will come into action, investigate the matter and suggest further course of action.

C. Action to be taken on detection of COVID -19 case in non-COVID health facility

1. When a **positive COVID-19 patient is identified in a health care facility,**

- Inform the local health authorities about the case
 - Assess the clinical status of the patient prior to referral to a designated COVID facility
 - The patient should be immediately isolated to another room (if currently being managed in a shared ward/room).
 - If the clinical condition permits, such patients should be masked and only a dedicated healthcare worker should attend this case, following due precautions.
 - If the clinical status of the case permits, transfer such case to a COVID-19 isolation facility (Dedicated COVID Health Centre or dedicated COVID Hospital), informing the facility beforehand about the transfer, as per his/her clinical status, test results (if available), with information to local health authority.
 - Complete case records of such patients must be made available to the receiving hospital.
 - Follow appropriate standard precautions while transporting the patient.
 - This should be followed by disinfection procedures at the facility and the ambulance.
 - **All contacts of this patient** (other patients being managed in the same room or ward, healthcare workers who have attended to him/her, support staff who may have come in close contact, caretaker/visitors etc.) **should be quarantined and followed up for 14 days.**
- Their details must also be shared with the local health authorities.

- **All close contacts** (other HCWs and supportive staff) of the confirmed case should be **put on Hydroxychloroquine chemoprophylaxis for a period of 7 weeks**, keeping in mind the contraindications of HCQ.

If a healthcare worker is suspected to have contacted the disease, the following additional action needs to be performed.

2. When a **suspect/confirmed COVID-19 HCW is identified**

- HCWs developing respiratory symptoms (e.g. fever, cough, shortness of breath) should be considered suspected case of COVID-19.
- He/she should immediately put on a facemask, inform his supervisor and HICC.
- He/she should be isolated and arrangement must be made to immediately refer such a HC to COVID-19 designated hospital (if not already working in such a facility) for isolation and further management.
- He/she should be immediately taken off the roster
- Rapidly risk stratify other HCWs and other patients that might have been exposed to the suspect HCW and put them under quarantine and follow up for 14 days (or earlier if the test result of a suspect case turns out negative). Their details must also be shared with the local health authorities.
- All close contacts (other HCW and supportive staff) of the confirmed case should be put on Hydroxychloroquine chemoprophylaxis for a period of 7 weeks, keeping in mind the contraindications of the HCQ .

All health facilities (HCF) must have a staffing plan in place including a contingency plan for such an event to maintain continuity of operations. E.g. staff in HCF can be divided into groups to work on rotation basis every 14 days and a group of back up staff which is pooled in case some high risk exposure/HCW with suspected COVID-19 infection is detected.

- Ensure that the disinfection procedures are strictly followed.

Once a suspect/confirmed case is detected in a healthcare facility, standard procedure of rapid isolation, contact listing and tracking disinfection will follow with no need to shut down the whole facility.

D. Decision on further /continued use of non-COVID facilities where a single/multiple COVID-19 case has been reported

A. Socio-demographic reasons:

Hospital's catchment area is a large cluster of COVID-19. Catchment area is having a population which has a large number of vulnerable individuals having multiple co-morbid condition, poor nutritional status and/or having individuals not able to practice social distancing e.g. slum clusters.

B. Internal Administrative Reasons:

The health facility is not up to the mark in IPC practices. Non-fulfilment of guidelines regarding triaging of patients in the outpatient department and emergency. Based on the scope of the cluster and degree to which the hospital has been affected (HCW patients, and HCW contacts), degree of the risk to the patients visiting the hospital such as those with chronic diseases etc. the decision can be made based on a risk assessment to:

1. If the hospital authorities are reasonably satisfied that the source case/s have been identified and isolated, all contacts have been traced and quarantined and adequate disinfection has been achieved, the hospital will continue to function.
2. In addition to steps taken above, if the health facility still continues to report new hospital acquired COVID-19 cases in the following days, it would be advisable to temporarily close the defined section of the health facility where the maximum number of HAI is being reported. After thorough cleaning and disinfection it can be put to use again.

- Despite taking the above measures, if the primary source of infection could not be established and /or the hospital is still reporting large number of cases among patients and HCWs a decision needs to be taken to convert the non-COVID health facility into a COVID health facility under intimation to the local health department. In such a scenario, the entire healthcare workers of the facility should be oriented in Infection Prevention and Control practices and other protocols.

Follow up actions: When a non-COVID health facility reports a COVID-19 case, the HICC will ensure the following in order to minimize the possibility of an undetected contact/case amongst other patients/HCWs:

- Ensure that active screening of all staff at the hospitals is done daily (by means of thermal screening especially at the start of shift)
- All healthcare and supportive staff is encouraged to monitor their own health at all the time for appearance of COVID-19 symptoms and report them at the earliest.
- Be on the lookout for atypical presentation (or clinical course) of admitted patients
- Standard precautions to be followed diligently by all
- Follow all guidelines regarding triaging of patients in hospital emergency and outpatient department.

RECOMMENDATION FOR EMPIRIC USE OF HYDROXY-CHLOROQUINE FOR PROPHYLAXIS OF SARS-COV-2 INFECTION

Background: Hydroxy-chloroquine is found to be effective against coronavirus in laboratory studies and in-vivo studies. Its use in prophylaxis is derived from available evidence of benefit as treatment and supported by pre-clinical data. The following recommendation for the use of hydroxy-chloroquine as a prophylactic agent against SARS-CoV-2 infection is based on these considerations, as well as risk-benefit consideration, under exceptional circumstances that call for the protection of high-risk individuals.

The National Taskforce for COVID-19 recommends the use of hydroxy-chloroquine for prophylaxis of SARS-CoV-2 infection for selected individuals as follows:

Eligible individuals:

- Asymptomatic healthcare workers involved in the care of suspected or confirmed cases of COVID-19
- Asymptomatic household contacts of laboratory confirmed cases

Dose:

- Asymptomatic healthcare workers involved in the care of suspected or confirmed cases of COVID-19: 400 mg twice a day on Day 1, followed by 400 mg once weekly for next 7 weeks; to be taken with meals
- Asymptomatic household contacts of laboratory confirmed cases: 400 mg twice a day on Day 1, followed by 400 mg once weekly for next 3 weeks; to be taken with meals

Exclusion/contraindications:

- The drug is **not recommended for prophylaxis in children under 15 years of age.**
- The drug is contraindicated in persons with known case of **retinopathy**, known **hypersensitivity to hydroxychloroquine, 4-aminoquinoline compounds** .

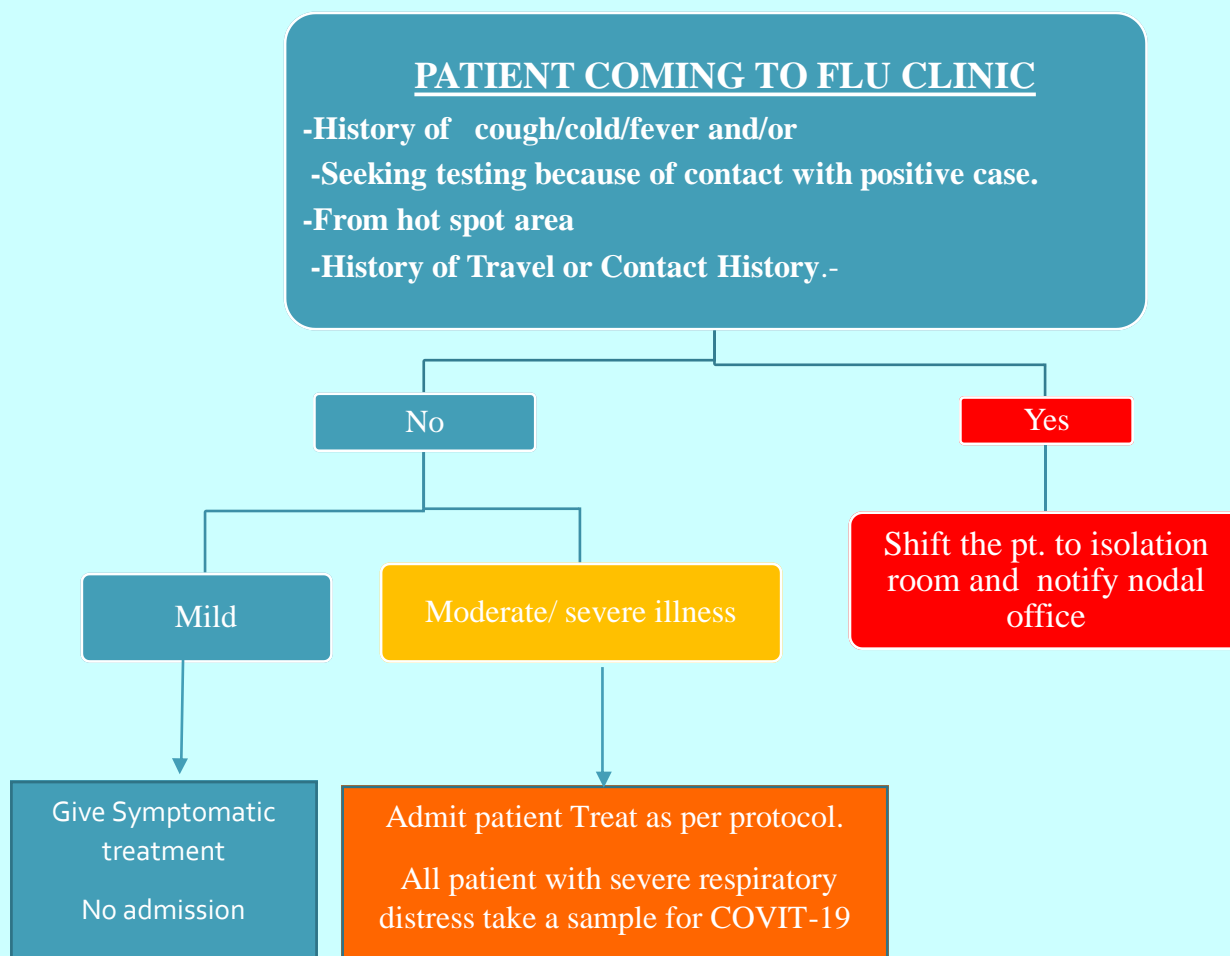
Key considerations:

- The drug has to be given only **on the prescription of a registered medical practitioner.**
- Advised to consult with a physician for any adverse event or potential drug interaction before initiation of medication.
- The prophylactic use of hydroxychloroquine to be coupled with the pharmacovigilance for adverse drug reactions through self-reporting using the Pharmacovigilance Program of India (PvPI).
- If anyone becomes symptomatic while on prophylaxis he/she should immediately contact the health facility, get tested as per national guidelines and follow the standard treatment protocol.
- All asymptomatic contacts of laboratory confirmed cases should remain in home quarantine as per the national guidelines, even if they are on prophylactic therapy.
- Simultaneously, proof of concept and pharmacokinetics studies be taken up expeditiously. Findings from these studies and other new evidence will guide any change in the recommendation.

Note - It is reiterated that the intake of above medicine should not in still sense of false security. The hydroxy-chloroquine may not be replaced by any other compound.

https://icmr.nic.in/sites/default/files/upload_documents/HCO_Recommendation_22March_final_M_V2.pdf

FLOW CHART OF MANAGEMENT



Category of probable case with travel history

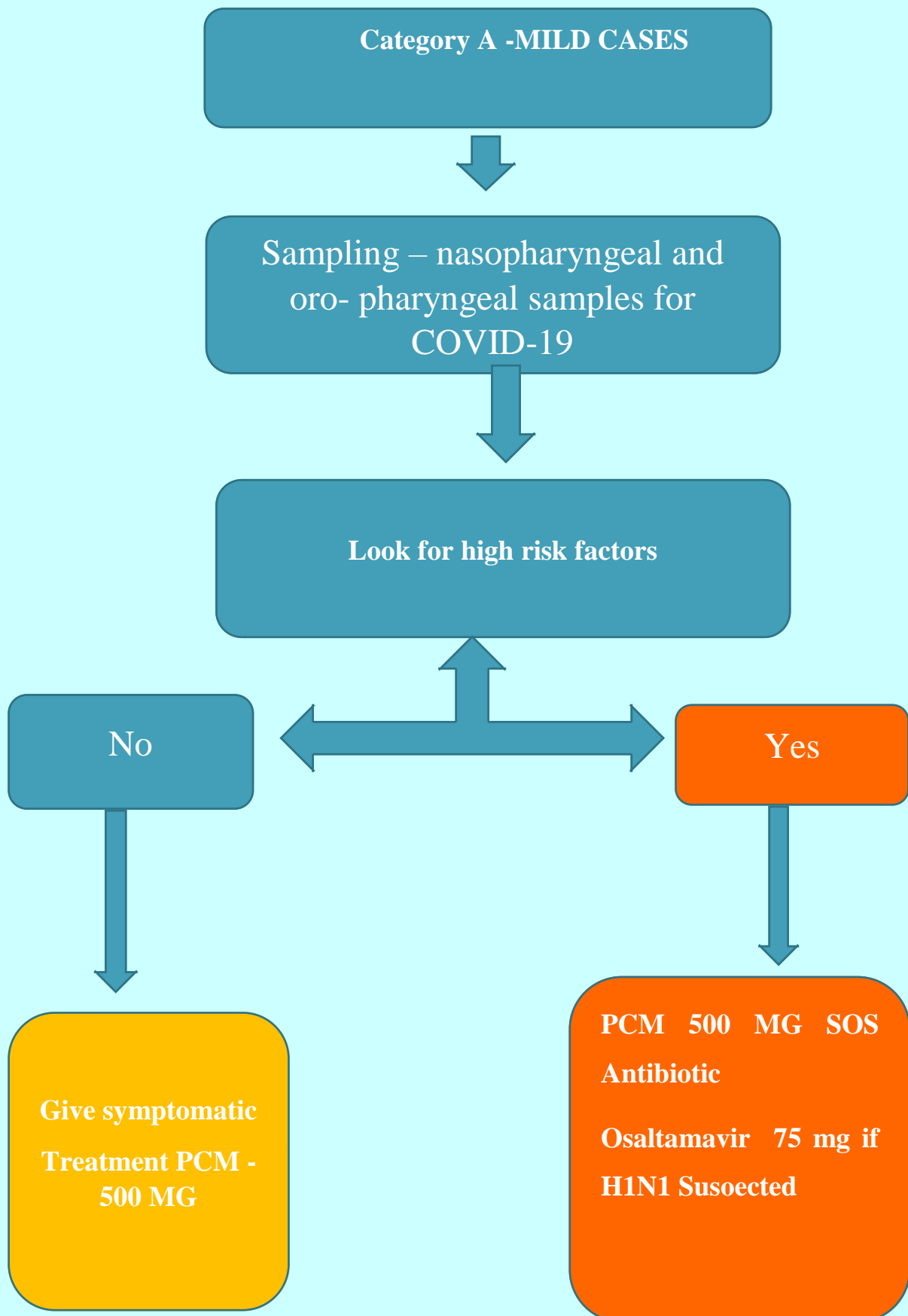
1. **Category A** – Travel history/ contact History with symptoms.
2. **Category B**- Travel History / contact History and asymptomatic with age more than 60 yrs, with co-morbidities like DM HTN, Asthma or any immune compromised state.
3. **Category C** – Travel history/ contact History asymptomatic except category B.

Treatment and management

Category A –Admit and isolate

Category B- Institutional Quarantine

Category C-Home Quarantine / Secondary Quarantine



Category A Severe Case

**Admit in isolation ward
Take Nasopharyngeal and oropharyngeal
samples for COVID- RT- PCR**

**Start Treatment
as per protocol of severe cases**

rt-PCR Results

Negative

**Treat as per
instate protocol
for severe cases**

Positive

**Shift pt. to COVID
Hospital.
.In COVID Hospital
start specific treatment**

CATEGORY A -SEVERE CASES

- I. **Antibiotics** -Start higher antibiotics depending upon severity (moderate to severe cases). **IV Ceftriaxone** (1 gm IV BD) + **Azithromycin** IV 500 MG OD) or in accordance with present condition.
- II. **Neuraminidase inhibitor / Osaltamavir** (75 mg BD) De-escalate the treatment on the basis of culture and PCR report.
- III. **Supportive treatment.**
 - a. Adult with emergency signs [severe respiratory distress, central cyanosis / shock- give -High flow oxygen start with 5 litre / min and titrate (to achieve spo2 target 94%) With nasal prongs)
 - b. Regular vital monitoring.
 - c. Conservative fluid management.
- IV **Further management** (*To be decided by nodal officer*)
 1. ***Refer the patient to DRPGMC Tanda/ COVID Hospital after the positive COVIT -19 report comes positive for further management.***
 2. ***Or decide as per the future guideline from Govt.***

SPECIFIC COVID 19 Treatment

No current evidence from RCT- so no specific antiviral treatment recommended for COVID 19 confirmed patients.

And should **ONLY** be used with proper informed expressed consent on case to case bases within the undermentioned framework along with supportive treatment.

In COVID 19 laboratory confirmed cases when following criteria are met.

- A. Symptomatic patients with any of the following
 - a. Hypoxia
 - b. Hypotension
 - c. New onset organ dysfunction (one or more)

- i. Increase in creatinine by 50%, GFR reduction by >25% from baseline URINE OUTPUT < 0.5 ml/kg for 6 hours.
- ii. Reduction of GCS by 2 or more.
- iii. Any other organ dysfunction.
- d. High risk group.
 - i. Age > 60 years
 - ii. DM, Renal failure, chronic lung disease.
 - iii. Immuno-compromised pers

Drugs and Dosages

13. Hydroxy chloroquine (HCQ)-adult – 400 mg BD on day 1 F/B 200 mg BD for 4 days

Pediatrics dose – 6.5 mg / kg BD for day 1 F/B 3.25 mg BD for 4 days.

2. Lopinavir/ Ritonavir (200 mg/ 50 mg) 2 tablets twice daily for 10 days

(For patients unable to take medicine by mouth – Lopinavir – 400mg /

Ritonavir 100mg 5 ml suspension twice daily for 10 days.)

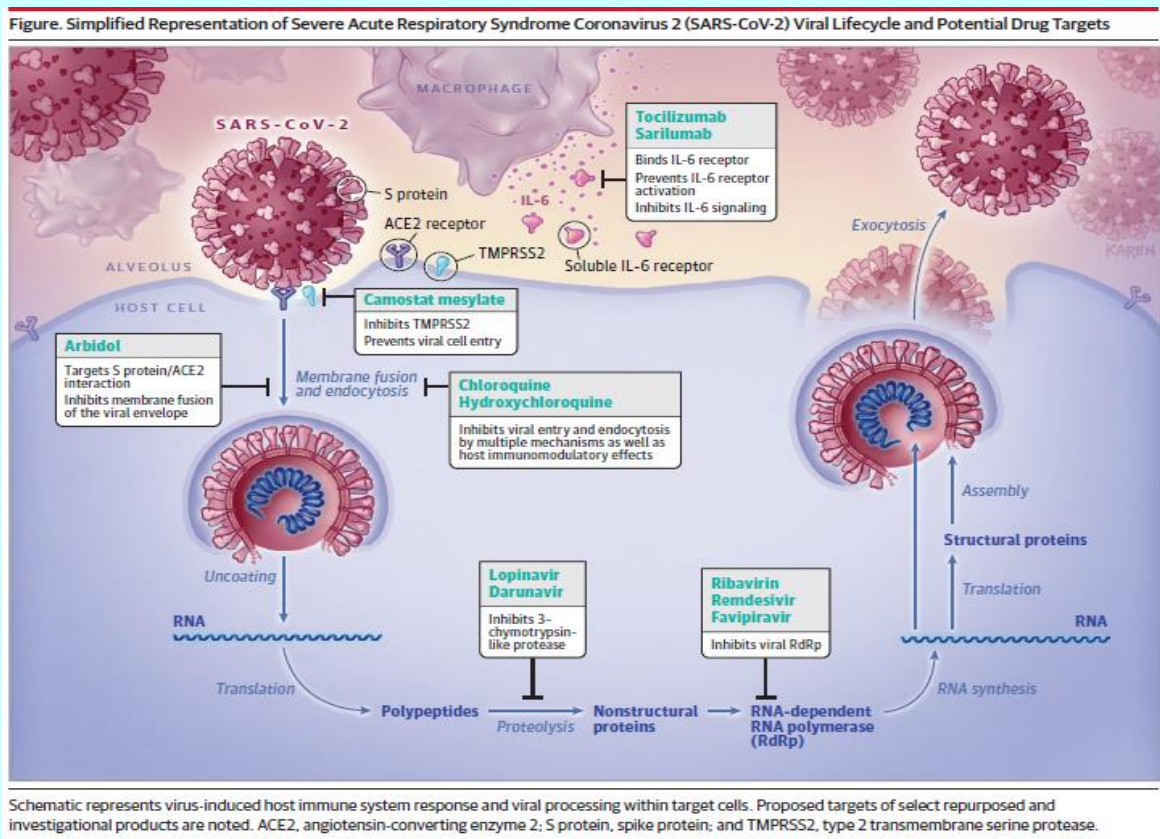
3. Tocilizumab (to be decided by the expert committee)

UPDATE ON PHARMACOLOGICAL TREATMENT FOR COVID-19

HIGHLIGHTS: This Bulletin covers the following:

- Lifecycle and potential drug targets of COVID 19
- Repurposed and Investigative agents
- Adjunctive agents
- Suggested pharmacological treatment

Severe Acute Respiratory Syndrome Coronavirus 2(SARS-CoV 2) Viral Life cycle and potential targets¹



Potential Targets Mechanism of action:

1. Camostat Mesylate : inhibits viral cell entry
2. Cholroquine /HCQ inhibits viral cell entry and endocytosis
3. Arbidol inhibits membrane fusion of viral envelope
4. Antiviral (Lopinavir , Remdesvir ,Ribavirin) inhibits RNA translation processes

TABLE 1: REPURPOSED DRUGS FOR SARS-COVID 19 ²

| Repurposed Agents | Target | Adult dose/administration | Toxicities |
|---|---|--|---|
| Chloroquine phosphate ²⁻⁴ Off label use | *Blockade of viral entry by inhibiting glycosylation of host receptors, proteolytic processing. *immunomodulatory effects through inhibition of cytokine production, autophagy | 500 mg by mouth every 12-24 h × 5-10 d. Dose adjustments: Kidney: creatinine clearance <10 mL/min administer 50% of dose. | Common: Abdominal cramps, anorexia, diarrhea, nausea, Vomiting. Major :Cardiovascular effects (including QTc prolongation) Hemolysis with G6PD deficiency, Hypoglycemia, Retinal toxicity Neuropsychiatric |
| Hydroxychloroquine & sulfate ^{5,6} Off label use | same mechanism of action as chloroquine | 400 mg by mouth every 12 h × 1 d, then 200 mg by mouth every 12 h × 4 d | QT prolongation Cautious use with azithromycin and fluoroquinolones |
| Lopinavir/ritonavir ^{7,8} Off label use | Viral protease inhibitor | Early administration during peak viral replication phase (initial 7-10 days) 400 mg/100 mg by mouth every 12 h for up to 14 d. Use with caution in hepatic impairment. | Common: Gastrointestinal intolerance, nausea, vomiting, diarrhea. Major: Hepatotoxicity |
| Umifenovir (Arbidol) ^{9,10} Currently approved in Russia and China for treatment and prophylaxis of influenza | Sprotein /ACE2 Membrane fusion inhibitor | 200mg every 8hour by mouth | Elevated transaminase , kidney injury |

Ribavarin¹¹ : inhibits viral dependent RNA polymerase , due to high dose required for inhibiting viral replication showed severe dose dependent haematologic toxicity.

Oseltamivir ¹¹: Neuraminidase enzyme inhibitor in influenza, no documented in vitro activity against SARS CoV2

| Agent | Mechanism | Dose | Adverse effects |
|--|---|--|--|
| Tocilizumab ¹⁶ | IL-6 inhibition-reduction in cytokine storm | 400 mg IV or 8 mg/kg × 1-2 doses. Second dose 8-12 h after first dose if inadequate response. Dose adjustments: Kidney: No dose adjustments | Common: Increase in upper respiratory tract infections (including tuberculosis), Nasopharyngitis, headache, Hypertension, increased AST, infusion related reactions. Major: Hematologic effects, infections, hepatotoxicity, gastrointestinal perforation |
| Corticosteroids ¹⁷ | Decrease host inflammatory response | Not recommended in routine use in COVID 19 Only in refractory shock or exacerbation of COPD | Can lead to delayed viral clearance Risk of secondary infections |
| Vitamin C ¹⁸ (Ascorbic acid) | Helps in development and maturation of T lymphocytes (NKcells) Inhibition of Reactive oxygen species production | 10mg iv being given in an open label trial : outcome yet to be published moderate dose of IV vitamin C considered (e.g. 1.5 grams IV q6 ascorbic acid plus 200 mg thiamine IV q12) no high quality evidence though | Mega dose long term can cause rebound scurvy on stoppage Risk of oxalate stones increased High doses cytotoxic when added to iron preparations |
| Vitamin D ¹⁹⁻²¹ (cholecalceferol) | *Enhances cellular innate immunity *reduce the production of pro-inflammatory cytokines(tumor necrosis factor α and interferon γ) *helps maintain tight junctions, gap junctions, and adherens junctions | Recommended : (people at risk of influenza and/or COVID-19) :10,000 IU/d for a month, increasing circulating levels of 25(OH)D into the preferred range of 40–60 ng/ml Maintenance: 5000 IU/d | When high doses of vitamin D are taken, calcium supplementation should not be high to reduce risk of hypercalcemia. Long term : renal stone , Nephrocalcinosis Hypertension , Growth retardation in children |
| Zinc ^{22,23} | *Interference with viral polyprotein processing *Inhibits CoV RNA polymerase activity *hampers replication in cell culture experiments | High iv dose under trial in Australia | Nausea, vomiting, loss of appetite, Stomach cramps, diarrhea, and Headaches |

* During the COVID-19 epidemic, all people in the hospital, including patients and staff, should take vitamin D supplements to raise 25(OH) D concentrations as an important step in preventing infection and spread

IMMUNOGLOBULIN THERAPY²⁴

- Another potential adjunctive therapy for COVID-19 is the use of convalescent plasma or hyperimmune immunoglobulins
- Antibodies from recovered patients may help with both free virus and infected cell immune clearance.
- Anecdotal reports or protocols for convalescent plasma have been reported as salvage therapy in SARS and MERS
- On March 24, 2020, the FDA released guidance for requesting an emergency investigational new drug application and screening donors for COVID-19 convalescent plasma.

| Severity of illness | Plan of treatment |
|--|---|
| Mild illness ✓ without any risk factors/ Co-morbidities | ✓ Outpatient care ✓ Strict Home Quarantine monitored by government/health authorities ✓ Supportive care Assess patient's clinical condition |
| Moderate Illness: ✓ Dyspnoea ✓ Hypoxemia ✓ Infiltrates/ consolidation on chest x-ray/ CT scan | ✓ Admit in Hospital isolation room ✓ Supportive care ✓ Start empirical antibiotics as per local community acquired pneumonia treatment guidelines ✓ Consider starting Hydroxychloroquine or Lopinavir/Ritonavir (If evident risk factors for progression of disease are present) |
| Critical Illness: ✓ Mechanically ventilated patient's ✓ Multi lobar/ bilateral lung consolidation | ✓ Hydroxychloroquine (Dose 400mg BD – for 1 day followed by 200mg BD for 4 days)* In combination with Azithromycin (500 mg OD for 5 days) (closely monitor for side effects including QTc interval). ✓ Remdesivir (for compassionate use only) ✓ Tocilizumab can be considered (check IL-6 level prior to starting Tocilizumab). Especially in patients with evidence of cytokine release syndrome. ✓ Continue IV antibiotics and supportive care. ✓ Rule out ventilator associated pneumonia/ catheter related infections and other secondary bacterial/viral/fungal infections ✓ Always keep in mind the to rule out differentials of non –resolving pneumonia ✓ In n ventilated patients: follow ARDS NET protocol strategy ✓ Refractory or progressive cases in ICU: Interferon beta B1 can be considered. However, it should be combined with an anti-viral (Lopinavir/Ritonavir) and hydroxychloquine |

Disclaimer: *Guidance document of MOHFW states that NO SPECIFIC ANTIVIRALS have been proven to be effective as per currently available data

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 environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure. (Reference: World Health Organization. (2019))

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.

Personal Protective Equipment (PPE) to be used 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 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 staying, 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.

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.

5. 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 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 (door handles and knobs, telephone, bedrails, ventilator knobs, drip stands, nursing counters, medicine trolleys, 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.

Mobile phone use and disinfection

- Do not take phone inside the isolation rooms.
- Operate mobile phone only in duty room.
- While working, use mobile phones only when required.
- Avoid repeated use of mobile phone.
- Avoid using other person's mobile phone especially if he/she is having URI like symptoms.
- Perform hand hygiene frequently (as indicated) and follow respiratory hygiene and etiquettes.
- Perform hand hygiene before and after using mobile phone.
- Do not bring mobile phones in contact with mask and PPEs.
- Sanitize the mobile phone if the mobile phone is taken inside isolation and contact occurred, before entering the ward, and before leaving the ward.
- Clean mobile phones within one minute of suspected contact.
- Clean mobile phone **with 60-70% isopropyl alcohol wipes**.
- Use the hand sanitizer (alcohol-based hand rubs) available in ward as it contains 70% alcohol.
- Use a wipe or sterile gauze piece smeared with hand sanitizer.
- Clean the surfaces of mobile phone and crevices for 1 minute.
- If mobile phone is in case/mobile cover, clean cover with mobile phone.
- Make sure to perform hand hygiene before and after sanitization of mobile phone.
- Do not dip mobile phone in steriliser or soap solution or spray hand sanitizer over it.

PROTECTIVE MEASURES

GENERAL / STANDARD PRECAUTIONS FOR ALL:

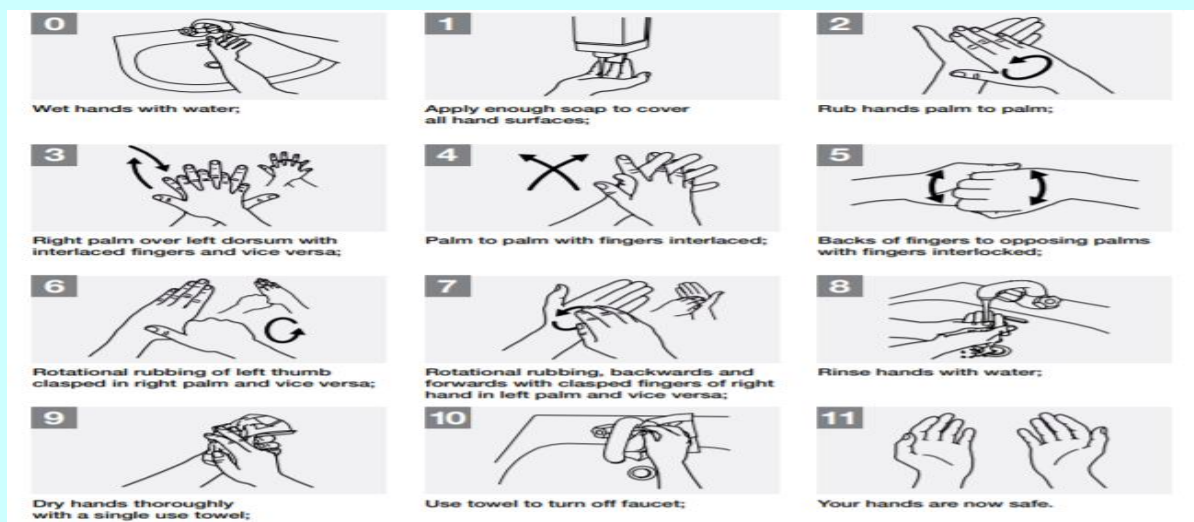
Infection control and prevention measures

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 PPE Protocol.

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) using WHO recommended steps hand washing steps. If hands are visibly soiled, use soap and water for hand wash.
- ii. Perform hand hygiene 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.

Hand washing Steps



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. Practice hand hygiene and hand washing before wearing a mask. 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.
- 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



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, jewellery, watches, electronic etc.
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 snugly without wrapping all around the waist.
6. 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
8. Wear eye piece – adjust the strap according to required size, open the ports at upper end to prevent fogging while wearing, upper end of 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.
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.

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

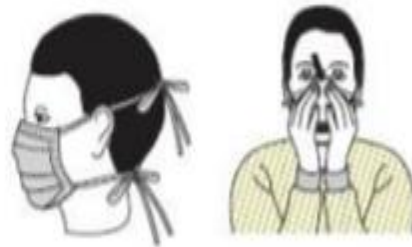
1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



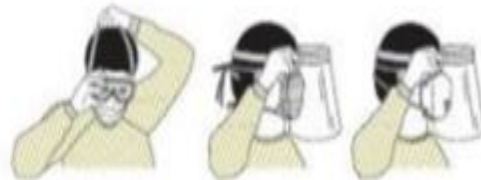
2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



PERSONAL PROTECTIVE EQUIPMENT (PPE): (BASED ON NCDC AND WHO GUIDELINES)

OUTPATIENT FACILITIES

1. Consultation Room

1. Healthcare workers

A. Physical examination of the patient with **respiratory symptoms-**

- **Medical mask ,Gown, Gloves, Eye protection**

B. Physical examination of patients without respiratory symptoms

- PPE according to standard precautions and risk assessment

2. Patients

A. with respiratory symptoms

- **Provide any medical mask** if tolerated.

B, Patients without respiratory symptoms

- No PPE required

3. Cleaners

After and between consultations with patients with respiratory symptoms

- Medical mask Gown Heavy-duty gloves Eye protection (if the risk of splash from organic material or chemicals) Boots or closed work shoes

2. Waiting room

A. Patients

1. With respiratory symptoms

- **Provide medical mask** if tolerated Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure a spatial distance of at least 1 m from other patients

2. Patients without respiratory symptoms

- No PPE required

3. Administrative areas

A. All staff, including healthcare workers

Administrative tasks.

No PPE required.

POINTS OF ENTRY

1. Screening area

1. Staff

A. First screening (temperature measurement) not involving direct contact

- Maintain a spatial distance of at least 1 m.
- No PPE required

B. Second screening (i.e., interviewing passengers with fever for clinical symptoms suggestive of COVID-19 disease and travel history)

- Medical mask, Gloves

2. Cleaners

A. Cleaning the area where passengers with fever are being screened

- Medical mask Gown Heavy-duty gloves Eye protection (if the risk of splash from organic material or chemicals) Boots or closed work shoes

TEMPORARY ISOLATION AREA

1. Staff /healthcare workers

A. Entering the isolation area, but not providing direct assistance

- Maintain a spatial distance of at least 1 m Medical mask Gloves

B. Assisting passenger being transported to a healthcare facility

- Medical mask Gown Gloves Eye protection

2. Cleaners

A. Cleaning isolation area

- Medical mask Gown Heavy-duty gloves Eye protection (if the risk of splash from organic material or chemicals) Boots or closed work shoes

AMBULANCE OR TRANSFER VEHICLE

1. Healthcare workers

A. Transporting suspected COVID-19 patients to the referral healthcare facility

- Medical mask, Gowns, Gloves, Eye protection

2. Driver

A. Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID19 patient

- Maintain a spatial distance of at least 1 m No PPE required

B. Assisting with loading or unloading patient with suspected COVID-19 disease

- Medical mask Gowns Gloves Eye protection

C. No direct contact with a patient with suspected COVID-19, but no separation between driver's and patient's compartments

- Medical mask.

3. Patient with suspected COVID-19 disease

A. Transport to the referral healthcare facility

- Medical mask if tolerated

4. Cleaners

A. Cleaning after and between transport of patients with suspected COVID-19 disease to the referral healthcare facility

- Medical mask, Gown, Heavy-duty gloves, Eye protection (if the risk of splash from organic material or chemicals) Boots or closed work shoes

INPATIENT FACILITIES

Patient Room

1. Healthcare workers

a. Providing direct care to COVID-19 patients

- Medical mask, Gown, Gloves, Eye protection (goggles or face shield)

b. Aerosol-generating procedures performed on COVID-19 patients

- Respirator (N95 or FFP2 standard, or equivalent) Gown, Gloves, Eye protection, Apron.

2. Cleaners

a. Entering the room of COVID19 patients

- Medical mask, Gown, Heavy-duty gloves, Eye protection (if the risk of splash from organic material or chemicals) Boots or closed work shoes

3. Visitors entering the room of a COVID-19 patient

- Medical mask, Gown, Gloves.

OTHER AREAS OF PATIENT TRANSIT (e.g., wards, corridors).

1. All staff, including healthcare workers

a. Any activity that does not involve contact with COVID19 patients

- No PPE required

TRIAGE AREA

1. Healthcare workers

a. Preliminary screening not involving direct contact

- Maintain a spatial distance of at least 1 m No PPE required.

2. Patients

a. With respiratory symptoms

- Any Maintain a spatial distance of at least 1 m
- Provide medical mask if tolerated by the patient

b. Without respiratory symptoms

- No PPE required

LABORATORY

1. Lab technician

a. Manipulation of respiratory samples

- Medical mask, Gown, Gloves, Eye protection (if the risk of splash)

ADMINISTRATIVE AREAS

1. All staff, including healthcare workers

Administrative tasks that do not involve contact with COVID-19 patients

- No PPE require

WHEN TO USE N95 MASK:

- NOT required for routine use
- USE for aerosol-generating procedures
 - Tracheal intubation
 - Non-invasive ventilation
 - Tracheostomy
 - cardiopulmonary/neonatal resuscitation
 - Manual ventilation before intubation
 - Bronchoscopy o oral or tracheal suction
- To be used by all HCW inside the Covid unit and respiratory isolation of APC Emergency

Precautions while performing aerosol generating procedures

- Should preferably be done by a HCW who has recovered from COVID-19
- Remove all HCW from the room, except those needed for the procedure
- Close the door of the room • Ensure that the exhaust fan is ON
- Ensure AC if any in another room is switched off. (As it will draw the air in)
- Switch off all ceiling fans in the area
 - Ensure full PPE are worn as per guidelines
 - Preferable to have a large room with good airflow
- Use air purifiers with HEPA filter in the room, If possible
- Remove any high risk HCW from the room (e.g., Diabetic)

SPRAYING OF DISINFECTANT ON PEOPLE FOR COVID-19 MANAGEMENT

Disinfectants are chemicals that destroy disease causing pathogens or other harmful microorganisms. It refers to substances applied on inanimate objects owing to their strong chemical properties. Chemical disinfectants are recommended for cleaning and disinfection only of frequently touched areas/surfaces by those who are suspected or confirmed to have COVID-19. Precautionary measures are to be adopted while using disinfectants for cleaning – like wearing gloves during disinfection.

In view of the above, the following advisory is issued:

- **Spraying of individuals or groups is NOT recommended under any circumstances.** Spraying an individual or group with chemical disinfectants is physically and psychologically harmful.
- Even if a person is potentially exposed with the COVID-19 virus, spraying the external part of the body does not kill the virus that has entered your body. Also there is no scientific evidence to suggest that they are effective even in disinfecting the outer clothing/body in an effective manner.
- Spraying of chlorine on individuals can lead to irritation of eyes and skin and potentially gastrointestinal effects such as nausea and vomiting. Inhalation of sodium hypochlorite can lead to irritation of mucous membranes to the nose, throat, respiratory tract and may also cause bronchospasm.
- Additionally use of such measures may in fact lead to a false sense of disinfection & safety and actually hamper public observance to hand washing and social distancing measures

HEALTH CARE WORKERS

Symptomatic HCW

- As per the ICMR guidelines, all symptomatic healthcare workers must be tested for Covid.

Asymptomatic exposed HCW

- HCWs who come in contact with a COVID positive case **without donning PPE must be quarantined for a period of 14 days**. During this period, the HCW must monitor his/her own temperature keep a watch on symptoms suggestive of a viral infection.
- HCWs who come into contact with another asymptomatic HCW who has been in contact with a Covid positive patient, does not need to do anything.

Hydroxy chloroquine prophylaxis for HCW

Offered to Frontline workers at risk of contact with COVID suspected / confirmed patients

Procedure:

1. Get an ECG
2. Sign in an informed consent
3. Get the first dose – directly observed therapy
4. Subsequent weekly doses and further procedure will be advised

PROTOCOL FOR USING 'RAPID ANTIBODY TEST' IN HOT AREA - EPIDEMIOLOGICAL STUDIES AND SURVEILLANCE

1. It is critical to understand the following key facts while using the rapid antibody tests:
 - a. Gold standard frontline test for COVID-19 diagnosis is real time PCR based molecular test, which is aimed at early virus detection.
 - b. The rapid antibody test cannot replace the frontline test.
 - c. The rapid Antibody test is a supplementary tool to assess the prevalence of the diseases within a specific area I perimeter. The rapid antibody test will only be of utility after a minimum of 7 days of onset of symptoms.
 - d. Data about these rapid tests is emerging and understanding of their utility for diagnosis is still evolving.
 - e. The rapid tests are useful for epidemiological studies and surveillance purposes.
 - f. **THE TEST HAS TO BE DONE UNDER STRICT MEDICAL SUPERVISION.**

2. The enclosed ICMR advisory is for Hot spots. In case your state does not have a Hot spot, these tests may be used for:-
 - a) Any hotspot which may emerge in future OR
 - b) As a surveillance tool for epidemiological purposes in such areas where cases have not emerged so far.

5. Before starting the rapid test, it should be registered on covid19cc.nic.in/ICMR and data related to the test should be reported on the same.

THERAPEUTIC PLASMA EXCHANGE IN COVID-19

1. At this moment ICMR does not recommend this as a treatment option outside of clinical trials.
2. Therapeutic Plasma Exchange (TPE) is an experimental procedure for critically ill COVID-19 patients.
3. Hospitals and Institutions planning to provide this modality of treatment should do so in a clinical trial with protocols which are cleared by the Institutional Ethics Committee
4. The protocols should be: -
 - 1) Registered with the Clinical Trial Registry of India (CTRI: <http://ctri.nic.in/Clinicaltrials/login.php>).
 - 2) They should be approved by Drugs Controller General of India, Central Drugs Standard Control Organization (<https://cdsco.gov.in/opencms/opencms/en/Home>).
 - 3) Mechanisms to report adverse and serious adverse events to the CDSCO should be put in place.

ICMR is inviting a letter of intent from institutions with the equipment and infrastructure available to participate in a clinical trial to study the safety and efficacy of therapeutic plasma exchange in COVID-19 patients, subsequent to necessary approvals and clearances.

https://icmr.nic.in/sites/default/files/upload_documents/LOI_TPE_12042020.pdf

DEFINITION OF SUSPECTED CASE AND CONTACT OF COVID-19

Suspected Case

Following are considered suspect cases of COVID-19 and must be tested.

1. All symptomatic individuals who have undertaken international travel in the last 14 days.
2. All symptomatic contacts of laboratory confirmed cases.
3. All symptomatic health care workers.
4. All hospitalized patients with Severe Acute Respiratory Illness (fever AND cough and/or shortness of breath).
5. Asymptomatic direct and high-risk contacts of a confirmed case should be tested once between day 5 and day 14 of coming in his/her contact.

Contact

- A person :
 - a. Providing direct care without proper personal protective equipment (PPE) for COVID-19 cases.
 - b. Staying in the same close environment of COVID-19 patient (including workplace, classroom, household, and gathering).
 - c. Traveling together in close proximity (1m) with symptomatic person who later tested positive for COVID-19.

High risk contact

- Touched body fluid of patient (respiratory tract secretion, blood, vomitus, saliva, urine feces).

- Had physical contact with the body of the patient, including physical examination without PPE.
- Touched or cleaned the linens clothes, or dishes of the patient.
- Lives in the same household as the patient.
- Anyone in close proximity (within 3 ft.) of confirmed case without precaution.
- Passenger in close proximity (within 3 ft.) of conveyance with a symptomatic person who later tested for COVID-19 for more than 6 hours.

Low risk contact

- Shared the same place (same class for school/ worked in the same room/ similar and not having a high risk exposure to a confirmed or suspected case of COVID-19).
- Travelled in the same environment (bus/ train/flight/ any mode of transit) but not having – high risk exposure.

<https://www.mohfw.gov.in/pdf/ICMRrevisedtestingstrategyforCOVID.pdf>

CATEGORIZATION OF PATIENTS

For the purpose surveillance patient shall be categorized on the following categories

Category A: Symptomatic (fever, sore throat/cough/rhinitis/diarrhea/ Breathlessness, Chest pain, drowsiness, fall in blood pressure, haemoptysis, cyanosis (red flag sign).

Children with ILI (Influenza like illness with red flag signs: Somnolence, high/persistent fever, inability to feed well, convulsions, dyspnoea, respiratory, distress, etc.).

Along with patients with h/o travel or contact within 28 days.

Category B: Asymptomatic high risk/vulnerable groups (Lung/heart/liver/kidney/neurological disease, blood disorders/uncontrolled diabetes/cancer/HIV-AIDS/On long term steroids/Pregnant lady/Age-more than 60 years.) with h/o travel or contact within 28 days.

Category C: Asymptomatic person (but not vulnerable) with h/o travel or contact within 28 days.

Category Red: Lab confirmed positive case.

| | Home Quarantine | Institutional Quarantine | Isolation for Probable Case | Isolation for Confirmed Case |
|---------------------|--------------------|-----------------------------|--------------------------------|---------------------------------|
| Category Red Person | | | | |
| Category A Person | | | | |
| Category B Person | | | | |
| Category C Person | | | | |

General guidelines for management

Category A

Patient will be admitted in designed COVID - 19 treatment centres.

Category – B

- a. Patient should come to designated COVID-19 treatment centres after informing local helpline or PHC. After clinical assessment at the hospital, decision on testing will be taken.
- b. Patient will be started on symptomatic treatment including treatment of other respiratory pathogens wherever applicable and will either be admitted or sent back for home isolation.
- c. If the treating hospital decides on home isolation the DSO of the corresponding district should be informed in the prescribed format for ensuring home isolation.
- d. If sent back for home isolation, doctor from nearby PHC will telephonically monitor progress of patient and assess development of red flag signs. Health workers/ supportive staff will assess adequacy of isolation facility using a checklist.

Category – C

No need to come to designed nodal centres. Patients should remain in strict home isolation.

Doctor from nearby PHC will telephonically monitor progress of patient and assess development of red flag signs.

Patients are advised to take:

- Plenty of warm nourishing oral fluids.
- Balanced diet
- Adequate sleep and rest
- Saline gargle for sore throat if present

And strict social distancing as well as from home contact

SURVEILLANCE AND CONTACT TRACING

Community based Contact Tracing Implementation Guidelines

1. As soon as the single event (identification of confirmed case) is detected, contact tracing must be aggressively implemented (**preferably to be completed within 48 hours**).
2. The contact tracing shall preferably be done by visiting the local residence of the contact(s) by a Health Personnel. Other methods of communication like telephone may be used in certain circumstances or for follow-up.
3. On meeting the 'contact person' the visiting Health Personnel should introduce him (her) self, explain the purpose of contact tracing and should collect data in the prescribed format.
4. Contact tracing must include identification of extended social networks and travel history of cases during the 28 days after onset of illness.
5. Contacts of confirmed cases should be traced and monitored for at least 28 days after the last exposure to the case patient for evidence of COVID 19 symptoms as per case definition.
6. Information about contacts can be obtained from:
 - a. Patient, his/her family members, persons at patient's workplace or school associates, or
 - b. Others with knowledge about the patient's recent activities and travels.
7. Case wise Line-listing of all exposed contacts shall be maintained with the following information:
 - a. Demographic information,
 - b. Date of last exposure or date of contact with the case patient,
 - c. Date of onset of fever or other symptoms developed, if any.

Advisory for Symptomatic contacts:

Refer persons with fever, cough and history of contact with a confirmed case within last 28 days for:

1. Isolation for strict infection control
2. Collection and transportation of sample for laboratory testing at designated lab.
3. Appropriate medical care for management of patient.

Advisory for Asymptomatic Contacts:

1. Remain at home (home quarantine) for at least 28 days after the last exposure with the case.
2. Initiate self-health monitoring for the development of fever or cough within 28 days after the last exposure to the case patient and maintain a list of contacts on daily basis.
3. If above described symptoms develop, person must put on the mask, self-isolate him in the home and inform the identified Local Health Official/District DHO/DSO by telephone and further management must be done at a designated health facility.
4. Active monitoring (e.g. daily visits or telephone calls) for 28 days after the last exposure shall be done by the identified Local Health Officials.

Note:

1. All high-risk contacts should be admitted at Isolation facility and tested.
2. Only symptomatic among low risk contacts need to be admitted and tested.

Health and safety precautions for the contact tracing official:

1. Maintain a distance of at least 2 meters (as advised by WHO) from the contact.
2. Personal protective equipment (PPE) is not needed for Contact Follow-up Teams and should not be worn. However, **masks should be worn by the contact tracing team.**

3. Maintain standard infection prevention and control measures and hand washing should be performed.

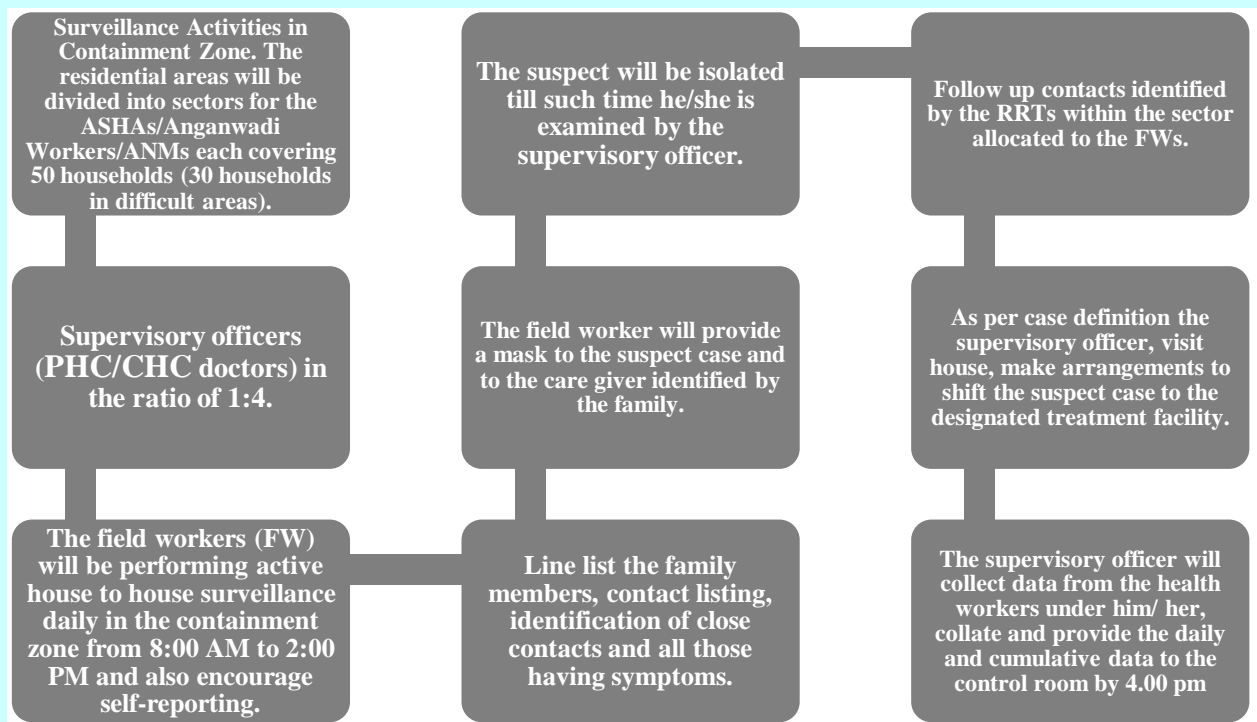
Whom to do surveillance:

1. History of foreign travel.
2. People who have come in contact with suspected COVID-19.
3. People with history of travel from different state.

How to do surveillance:

1. Self-reporting by concerned persons.
2. Involvement of PRIs.
3. Sending IEC material to these families.
4. Ensuring essential supplies to the concerned families to be the PRIs.
5. Daily self-reporting by phone to ASHA/ AWWs/ ANMs.
6. Contact tracing by RRTs within sector allocated to FWs.

Surveillance



**SOPS FOR QUARANTINE FACILITY FOR THE HEALTH
CARE PERSONNEL AND SUPPORTING STAFF
PERFORMING DUTY AT SECONDARY ISOLATION CENTRE
BHOTA.**

- **Facilities to be provided to Health care personnel**
 - Performing duty at COVID 19 Secondary Isolation facility Bhota will be quarantined for a period of 14 days after a duty of 7 days.
 - Will be provide boarding and lodging facility including food and laundry services.
 - Dedicated supporting staff will ensure basic amenities for the staff i.e. food services, sanitation, laundry and toiletries.
 - Each person will be provided a single room with a washroom and TV.
 - Should have CCTV facility for monitoring purposes.
 - Adequate security personnel to be provided.
 - A line list of the healthcare personnel and staff quarantined will be prepared.
 - During their stay at the Quarantine Centre, they will not be allowed to visit their home and will not meet other inmates of the quarantine facility.
 - Will wear a triple layer surgical mask at the facility.
 - Will follow strict boarding and lodging protocol during their stay at the quarantine facility i.e.
 - Avoid leaving quarantine facility and visiting public places.
 - Maintain hand and personal hygiene.
 - Self-assessment for the development of symptoms.
 - They have to report immediately to the Medical Superintendent, Dr. RK Govt. Medical College & Hospital Hamirpur or The Nodal Officer, COVID 19 Isolation Facility Dr. RK Govt. Medical College & Hospital Hamirpur if there is development of fever with/without respiratory symptoms.

Testing and Discharge Guidelines for health care workers:

- Every symptomatic worker will be tested for SARS CoV-2 and will be isolated immediately if found positive.

- Every team member quarantined will be screened and tested as per protocol.
- Nasopharyngeal/throat swabs will be taken and sent for testing between 5th to 14th days of quarantine (**PREFERABLY AT 10TH DAY**). The testing and sampling will be Co-ordinated by The Nodal Officer, COVID 19 Isolation Facility Dr. RK Govt. Medical College & Hospital Hamirpur.
- If the Health care worker tests positive, He / she will be isolated at Secondary Level Isolation Facility, Bhota, Hamirpur.
- Those who test negative will complete the mandatory 14 days quarantine period and then they will be discharges from the facility. They will further report to the Principal/ MS Dr RKGMC, Hamirpur for further direction/duties.
- The health care worker will not leave the quarantine facility if test result is awaited even after 14 days mandatory quarantine period.

Requirements for Quarantine facility:

1. Location:

Preferably placed in the outskirts of the urban/ city area away from the people's reach, crowded and populated area

- Well protected and secured by security personnel/police personnel.
- CCTV installed in the Facility.
- Parking space including Ambulances etc.
- Ease of access for delivery of food/medical/other supplies
- Well ventilated preferably natural.

2. Sanitization of the Facility:

The Quarantine Facility will be sanitized twice daily with freshly prepared 1% hypochlorite solution.

3. Basic infrastructure/functional requirements:

- Single Rooms with washrooms.
- Well Lighted, well-ventilation, heating, electricity, ceiling fan/AC
- Potable water to be facility.
- Functional telephone system for providing communication.
- Support services- food snacks, recreation including television

- Laundry services
- Sanitation services/Cleaning and House keeping Properly covered bins as per BMW may be placed .

4. Counselling Services

The Health Care workers staying in the Quarantine facility can contact the Helpline numbers of the College i.e. 01972-222222 (24 hours) or 01972-224 370 (9.30 A.M. – 4 P.M) for any consultation/counselling regarding any problem being faced.

5. Lodging, Catering, Laundry and other related activities –

- Disposable and pre-packed food needs to be served to quarantined people.
- Bed sheets should be changed on a daily basis.
- Personal toiletries/ towel/ blanket/ pillow with covers/electric kettle, room heater and water dispenser may be provided to each person depending on availability.
- A separate room needs to be assigned to perform laundry services for cleaning of all the clothes and other washing related activities. Linens should be disinfected with 1% hypochlorite up to 30 minutes before send for laundering.

6. Biomedical waste (BMW) management-

- To ensure that biomedical waste management in the facility takes place as per standard guidelines, separate yellow, red /black bags, foot operating dustbins needs to be kept at each floor, room and outside the facility.
- It is to be strictly ensured that Donning and Doffing for sample collection takes place in the designated area with all the PPE kit including mask, gloves and is properly placed in yellow bags.
- All the health care workers collecting the infectious material such as food items, PPE kits, etc. should wear PPE and following the Infection Control measures.
- Designated place to be earmarked outside the building for collection of BMW. It should be collected at least twice daily by biomedical waste management vehicle.

- All waste generated in the Quarantine Facility will be collected in Yellow bags. **This Yellow bag will be put in another Yellow bag sanitized by freshly prepared 1 % hypochlorite solution. The outer Yellow bag will be labeled as COVID 19 and the BMW will be collected daily by the Biomedical Waste Management vehicle.**
- Site of collection of biomedical waste should be regularly disinfected with freshly prepared 1% hypochlorite solution.
- All officials concerned with the administration and all other health care workers including medical, paramedical, nursing officers, waste handlers such as safai karmacharis, & Sanitation attendants needs to be well oriented to handling and management of general and biomedical waste generated at the facility.
- Steps in the management of biomedical waste include generation, accumulation, handling, storage, treatment, transport and disposal as mentioned in the SOP needs to be followed.
- Continuous training, monitoring & supervision to monitor the implementation to be done on daily basis to manage compliance related issues. All the generated waste from Quarantine facility to be treated as infectious waste and its disinfection /treatment will be strictly monitored.

The Revised Guidelines for BMW management for COVID 19 issued by the State Pollution Control Board dated 9.04.2020 will be the guidance document for the purpose of BMW management.

General Precautions for health care workers and staff in quarantine

- To stay alone in separate rooms till 14 days after their duties in corona unit are over
- To avoid meeting friends, colleagues, working staff in the facility. In case of unavoidable circumstances use face mask while meeting them
- Hand sanitizer should be kept in room and as well as every wing.
- Practice regular hand washing.
- To report immediately if anyone develops fever or other respiratory symptoms

IMPORTANT WEB LINKS

1. Masks for protection: https://www.youtube.com/watch?v=Ded_AxFfJoQ
https://www.youtube.com/watch?v=M4olt47pr_o
2. How to protect yourself against COVID-19 <https://www.youtube.com/watch?v=1APwq1df6Mw>
3. How to handwash? With soap and water <https://www.youtube.com/watch?v=3PmVJQUCm4E>
4. Coronavirus - seven steps to prevent the spread of the virus
https://www.youtube.com/watch?v=8c_UJwLq8PI
5. WHO guide on COVID-19: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
6. Donning and doffing of PPE as a part of preparedness against SARS CoV-2 in PGIMER, Chandigarh, India: <https://www.youtube.com/watch?v=QZenRtFqdH4&feature=youtu.be>
<https://youtu.be/oUo5O1JmLHo> https://youtu.be/kKz_vNGsNhc
7. National centre for disease control – India (Access the latest government notifications and advisories and readymade signages):
<https://ncdc.gov.in/index4.php?lang=1&level=0&linkid=127&lid=432>
8. WHO: Coronavirus disease (COVID-19) technical guidance
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>

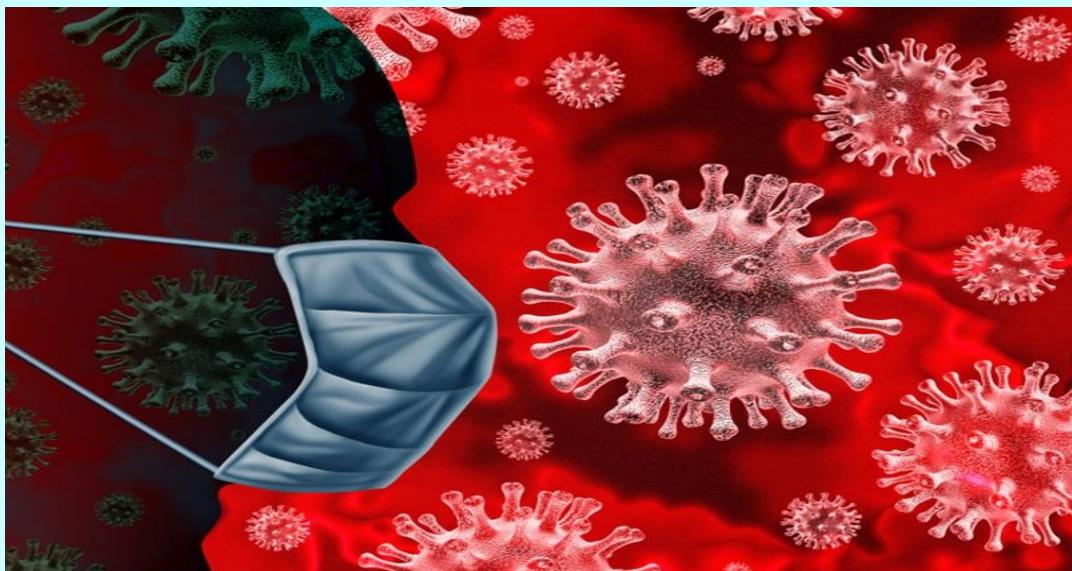
Contact numbers.

- **24 hour help line -01972 –222222.**
- **Help line 9.30 AM TO 4 PM -1972-224370.**
- **Nodal officer- 01972- 22272**

STAY PROTECTED



WIN COVID-19





DR. RADHAKRISHNAN
GOVERNMENT MEDICAL COLLEGE HAMIRPUR