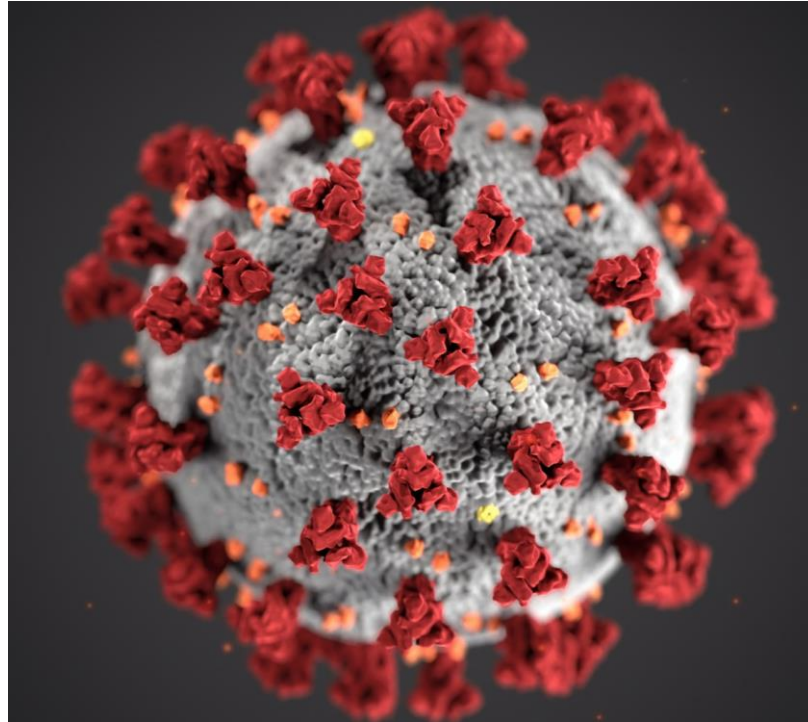


# COVID-19 Guideline and Management



**NATIONAL SERVICE SCHEME**

**Kazi Nazrul University, Asansol-713340**

## From the desk of Hon'ble Vice-Chancellor



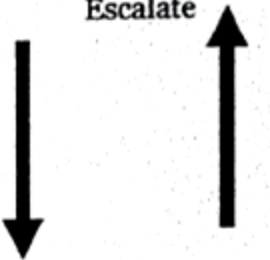
**Prof. (Dr) Sadhan Chakraborti**  
**Hon'ble Vice-Chancellor**  
**Kazi Nazrul University, Asansol**

The initiative of developing and circulating the booklet by the NSS Cell titled “COVID-19 Guideline and Management” in current COVID-19 pandemic situation prevailing in the state of West Bengal is commendable. The technical support provided by Director of Health Services, Govt. of West Bengal and Director of Medical Education, Govt. of West Bengal has assured the trustworthiness of the content of the booklet. It is a user friendly and important document for the management of COVID-19.

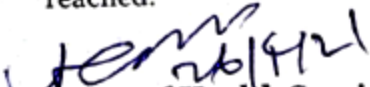
# WHEN TO START SERIOUS MONITORING A COVID PATIENT

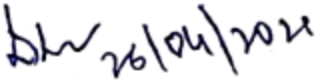
## When to start:

When SpO<sub>2</sub> becomes less than 94%

Indication	Oxygen Device	Flow rate	Target SpO <sub>2</sub> :	
SpO <sub>2</sub> =85-93% (at the beginning/ time of admission)	Nasal Prong	1-6 L/min	(a) During Initial stabilization: ≥ 94%  (b) After initial stabilisation: 92-96% (88-92% in known COPD)	
	Simple Face mask	6-10 L/min		
SpO <sub>2</sub> <85% (at the beginning/ time of admission)	NRBM	10-15 L/min		
	HFNO	Upto 60 L/min		

- **DE-ESCALATE** device and flow once target saturation is reached and use the minimum flow for maintaining target Saturation.
- **ESCALATE** if needed from Nasal Prongs to Simple Face Mask to NRBM, if patient does not maintain Target saturation.
- Allow at least 5 minutes for reaching / maintaining Target Saturation after each escalation / de-escalation of device / dose to check response except when there is immediate drop in SpO<sub>2</sub> > / = 3% while de-escalating (act fast in that case)
- **Oxygen prescription** should include: (a) Device (b) Flow rate (c) Target saturation
- **Referral:** CCU / HDU referral if Target saturation is not maintained with NRBM @ 10 L/min
- **Awake proning** should be combined with oxygen therapy in patients not maintaining Target saturation with > 2 L / min Oxygen by Nasal prongs or any higher oxygen dose if (a) Well tolerated (b) No contraindications.
- De-escalate oxygen device and dose during Awake proning procedure if target saturation is reached.

  
 Director of Health Services  
 Govt. of West Bengal

  
 Director of Medical Education  
 Government of West Bengal

# New Discharge policy

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## 1) Mild Cases:

- a) Afebrile and not needing oxygen support for last three days.
- b) Co-morbid conditions under control.

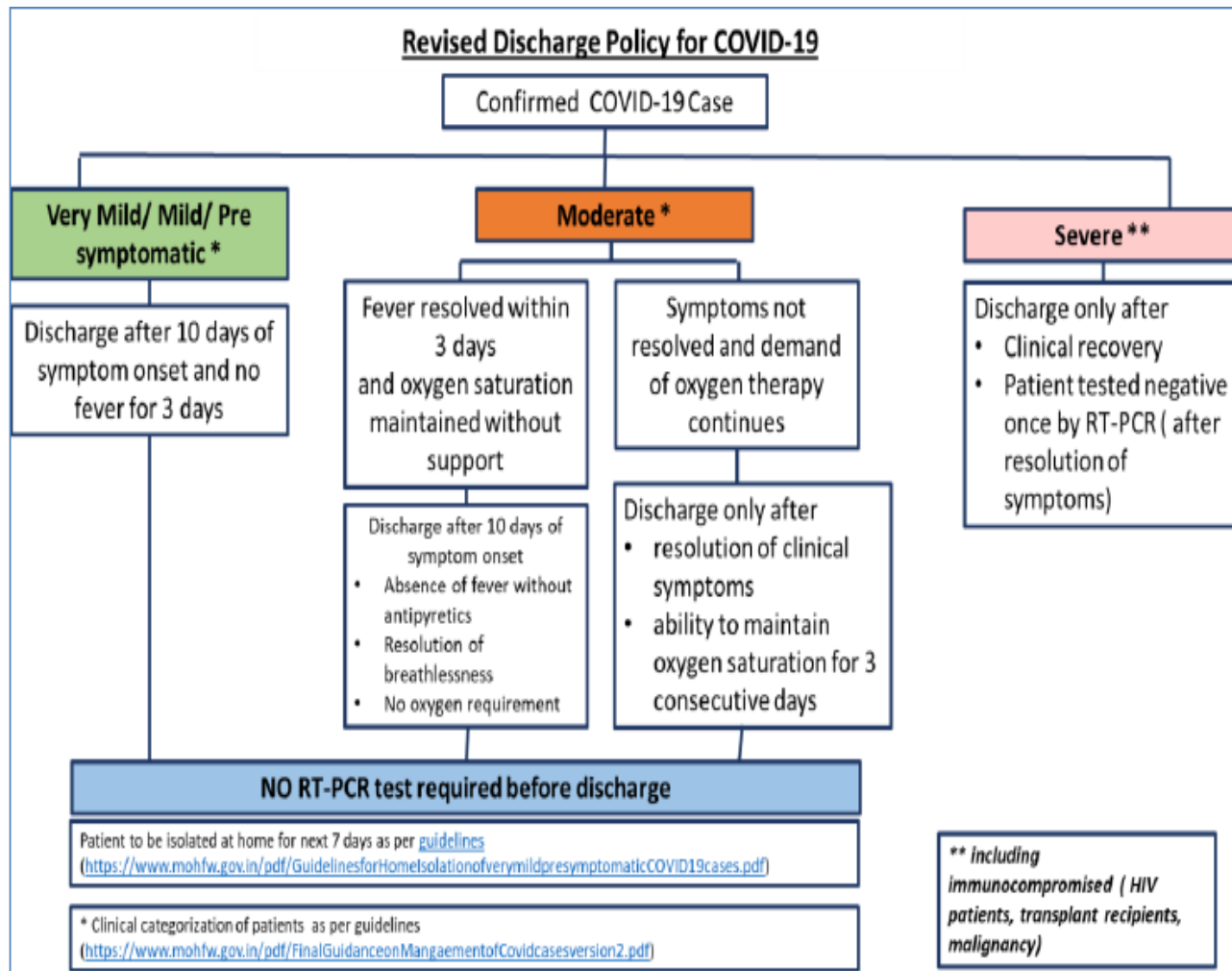
- **Send to Covid Care Centre/home isolation irrespective of the duration of illness.**

However patients aged 60 or above with more than one co-morbidity should preferably be treated at hospital up to ten days or full course of treatment.

## **Discharge from Covid Care Centre**

- Discharge from Covid Care Centre (after 10 days from onset of symptoms).
- No testing required prior to discharge.
- Will stay in home isolation till 17<sup>th</sup> day from the onset of symptoms.

# Do we need to do RT-PCR at discharge?



# HIGH DEPENDENCY UNITS OR INTENSIVE CARE UNITS ?

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## HDU/ ICU

### RESPIRATORY SUPPORT

- HFNC if work of breathing is HIGH
- A cautious trial of NIV /CPAP with full face mask/ oronasal mask
- Consider Intubation if work of breathing is high/ NIV is not tolerated
- Lung protective ventilation strategy by ARDS net protocol
- Prone ventilation in refractory Hypoxemia

### STEROID

- Dexamethasone 0.2 to 0.4 mg/kg for at least 5-10 days

### ANTICOAGULATION

Prophylactic dose of UFH or LMWH (e.g. Enoxaparin 0.5 mg/kg BD SC), if not at high risk of bleeding (consider UFH if CrCl<30)

### ANTIVIRAL

Antiviral agents are less likely to be beneficial at this stage; use of Remdesivir to be decided on case to case basis, Not to start after 10<sup>th</sup> days of symptom onset /Test date

**TOCILIZUMAB** may be considered on a case to case basis after shared decision making.

**ANTIBIOTICS** should be used judiciously as per Antibiotic protocol

### INVESTIGATIONS

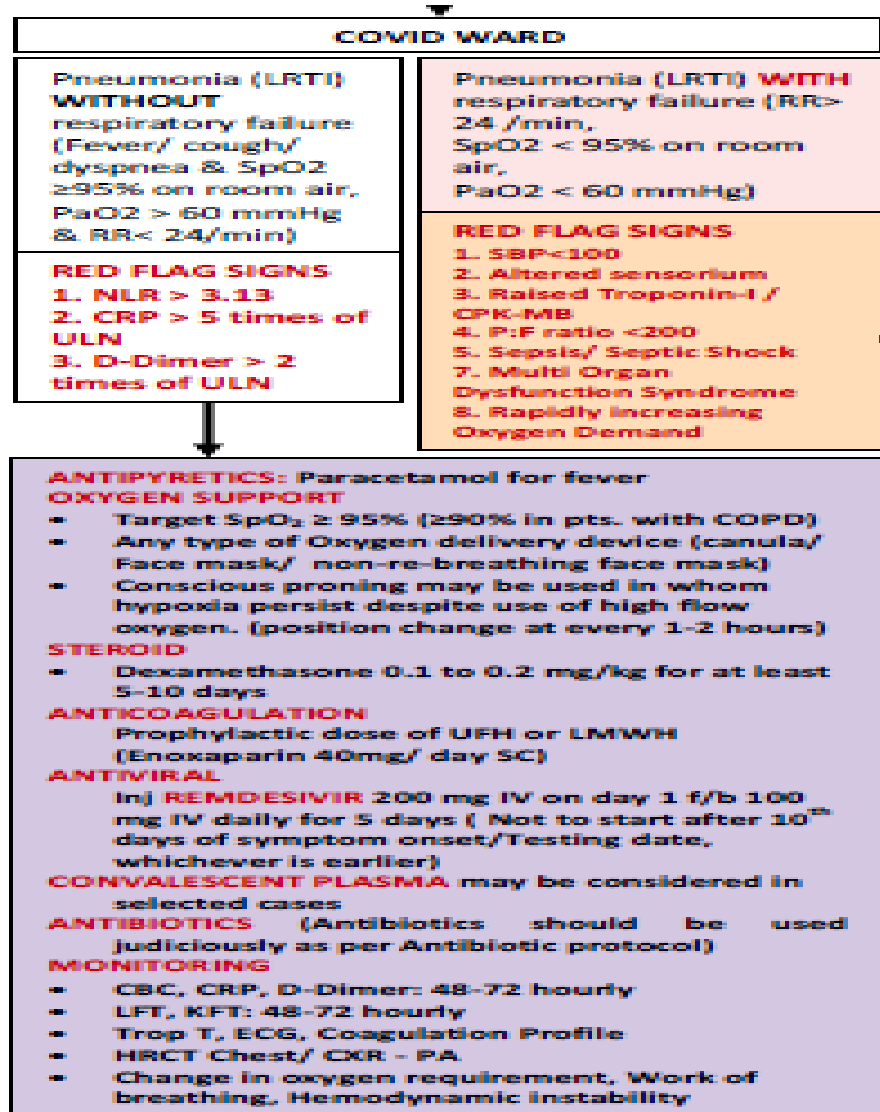
Essential investigations along with Cultures (Blood / Urine), FBS, PPBS, CBC, CRP, Ferritin, D-Dimer, Trop-T/ Quantitative Troponins, Procalcitonin, Coagulation Profile, HRCT Thorax.

### SUPPORTIVE MEASURES

- Maintain euvoolemia
- Sepsis/septic shock: manage as per protocol and antibiotic policy
- Sedation and Nutrition therapy along with as per existing guidelines (FAST HUGS)



# COVID-19 WARD MANAGEMENT



# COVID -19 HOME ISOLATION OR SAFE HOME ?

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## HOME ISOLATION / SAFE HOME

Following parameters should be observed at Home

1. Temperature
2. Pulse
3. Blood pressure
4. SpO2 ( by pulse oximeter)
5. Urine output (approximate)

Preferable Investigations:

CBC, CRP, D-Dimer from day-5 to day-17 at 48 to 96 hours interval, as required, if possible

CBG, Serum Creatinine, ECG : as required

### Management

- Supportive Management
- Mask, Hand Hygiene, Physical distancing, droplet precaution
- **IVERMECTIN** 12 mg OD for 5 Days  
AND  
**DOXYCYCLINE** 100mg BD for 7 days
- **PARACETAMOL** for fever
- **Vitamin C** 500 mg twice daily
- **Zinc** 50 mg per day
- Laxatives (if necessary)
- Supportive treatment for cough, diarrhea etc.
- Steroids should **NOT** be used routinely in patients with mild disease.



# TREATMENT OF LABORATORY CONFIRMED COVID 19 PATIENTS

Published by Department of Health & Family Welfare, Govt of West Bengal

## LABORATORY CONFIRMED COVID 19 PATIENT

- All asymptomatic patients.
- Comorbid patients with no symptoms (prioritize to control the comorbid state)
- Mild symptoms (low fever, dry cough, anorexia, ageusia, weakness, diarrhea, myalgia etc) with
  - No comorbidity
  - Low fever (<100.4 F)
  - No signs of respiratory distress
  - Normal SpO<sub>2</sub>
  - Normal mental status, systolic BP > 100 mmHg and Respiratory rate < 22/min

### HOME ISOLATION/ SAFE HOME

- MONITOR:** Temp, Pulse, BP, SpO<sub>2</sub>, Sensorium
- Preferable Investigations: CBC, CRP, D-Dimer
- ECG, CG, Serum Creatinine as required

- Supportive Management
- Mask, Hand Hygiene, Physical distancing, droplet precaution
- IVERMECTIN** 12 mg OD for 5 Days AND
- DORYCYCLINE** 100mg BD for 5-7 days
- PARACETAMOL** for fever, bodyache
- Mt C, Zinc
- Loxidine (if required)
- Steroids should **NOT** be used routinely in patients with mild disease

### Warning Signs

- Difficulty in breathing
- Persistent Fever/ High grade fever
- Recurrence of Fever
- Palpitations
- Chest pain/ Chest tightness
- Severe Cough
- Any new onset symptoms
- SpO<sub>2</sub> <95% ( Room Air)
- CRP > 5 times of ULN
- D-Dimer > 2 times of ULN
- NLR > 3.13
- Or, as advised by physician specially in High-Risk Group

Admit the patient at Covid Ward/ HDU/ ICU

Symptomatic patients with the following comorbidities:

- Age > 60 yrs
- DM
- HTN/ IHD
- COPD/Chronic lung disease
- Immunocompromised state
- Immunosuppressive drugs
- CKD
- Chronic Liver Disease
- Obesity

Symptomatic patients (irrespective of comorbid conditions) with any of the following signs:

- Fever > 100.4 F
- Respiratory rate > 22/ min
- Systolic BP < 90 mmHg
- SpO<sub>2</sub> <95%
- Respiratory distress
- Chest pain
- Change in mental status
- Cyanosis

No oxygen requirement or Oxygen requirement <10 L/min

### COVID WARD

Pneumonia (LRTI) WITHOUT respiratory failure (Fever/ cough/ dyspnea & SpO<sub>2</sub> ≥95% on room air, PaO<sub>2</sub> > 60 mmHg & RR < 24/min)

**RED FLAG SIGNS**  
 1. NLR > 3.13  
 2. CRP > 5 times of ULN  
 3. D-Dimer > 2 times of ULN

Pneumonia (LRTI) WITH respiratory failure (RR > 24 /min, SpO<sub>2</sub> < 95% on room air, PaO<sub>2</sub> < 60 mmHg)

**RED FLAG SIGNS**  
 1. SPP<90  
 2. Altered sensorium  
 3. Raised Troponin-I / CPK-MB  
 4. P-F ratio <200  
 5. Sepsis/ Septic Shock  
 7. Multi Organ Dysfunction Syndrome  
 8. Rapidly increasing Oxygen Demand

**ANTIPYRETICS:** Paracetamol for fever

### OXYGEN SUPPORT

- Target SpO<sub>2</sub> is 95% (or 90% in pts. with COPD)
- Any type of Oxygen delivery device (canula/ Face mask/ non-re-breathing face mask)
- Conscious patient may be used in whom hypoxia persist despite use of high flow oxygen. (position change at every 1-2 hours)

### STERIOD

- Dexamethasone 0.1 to 0.2 mg/kg for at least 5-10 days

### ANTICOAGULATION

Prophylactic dose of UFH or LMWH (Enoxaparin 40mg/ day SC)

### ANTIVIRAL

In REMDESIVIR 200 mg IV on day 1 to 100 mg IV daily for 5 days ( Not to start after 10<sup>th</sup> days of symptom onset/Testing date, whichever is earlier)

CONVALESCENT PLASMA may be considered in selected cases

**ANTIBIOTICS** (Antibiotics should be used judiciously as per Antibiotic protocol)

### MONITORING

- CBC, CRP, D-Dimer: 48-72 hourly
- LFT, RFT: 48-72 hourly
- Trop T, ECG, Coagulation Profile
- HRCT Chest/ CXR - PA
- Change in oxygen requirement, Work of breathing, Hemodynamic instability

Oxygen requirement >10 L/min

### HDU/ ICU

### RESPIRATORY SUPPORT

- HFNC if work of breathing is HIGH
- A cautious trial of NIV /CPAP with full face mask/ oronasal mask
- Consider Intubation if work of breathing is high/ NIV is not tolerated
- Lung protective ventilation strategy by ARDS net protocol
- Prone ventilation in refractory Hypoxemia

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Antiviral agents are less likely to be beneficial at this stage; use of Remdesivir to be decided on case to case basis, Not to start after 10<sup>th</sup> days of symptom onset /Test date

**TOCILIZUMAB** may be considered on a case to case basis after shared decision making

**ANTIBIOTICS** should be used judiciously as per Antibiotic protocol

### INVESTIGATIONS

Essential Investigations along with Cultures (Blood / Urine), PFS, PPFS, CBC, CRP, Ferritin, D-Dimer, Trop-T/ Quantitative Troponins, Procalcitonin, Coagulation Profile, HRCT Thorax.

### SUPPORTIVE MEASURES

- Maintain euvolemia
- Sepsis/septic shock: manage as per protocol and antibiotic policy
- Sedation and Nutrition therapy along with as per existing guidelines (FAST HUGO)

## TOP SHEET FOR THE MANAGEMENT OF COVID-19 PATIENTS

### PATIENT DETAILS ON ADMISSION

Name	Age	Gender	Bed No	Ward	Date of Admission	Registration No
Test	Date	Test Center	SpO <sub>2</sub> on Admission		Breathlessness on Admission	Sensorium on Admission
<input type="checkbox"/> RT-PCR <input type="checkbox"/> RAT					No/Mild/Moderate/Severe	Conscious/Drowsy/Unconscious

### PATIENT FACTORS TO BE NOTED DURING ADMISSION

Diabetes	Hypertension	Heart Disease	COPD / Asthma	Chronic Kidney Disease	Chronic Liver Disease
Cerebrovascular Disease	Cancers	HIV	Immunosuppressive Drugs	Obesity	Pregnancy
List of Regular Medicines at Home					

### DAY - 1    DATE .....    TWICE DAILY NOTES ON CLINICAL AND LABORATORY PARAMETERS, TREATMENT GIVEN AND INVESTIGATIONS

Day Time	SpO <sub>2</sub>	SpO <sub>2</sub>	Pulse Rate	Temperature	Blood Pressure	Consciousness Level	Urine Output	Any New Symptom	Blood Glucose
6 am - 6 pm									
Night Time	SpO <sub>2</sub>	SpO <sub>2</sub>	Pulse Rate	Temperature	Blood Pressure	Consciousness Level	Urine Output	Any New Symptom	Blood Glucose
6 pm - 6 am									
Treatment Given	Ivermectin		Doxycycline	Oxygen Flow	Oxygen Mode	Dexamethasone	LMWH/Heparin	Home Medications	Insulin/Others
Investigation Done	CRP		D-Dimer	Total Count	N : L Ratio	CXR / HRCT	LFT	Urea / Creatine	Others

Nurse's sig. M-                      . E/N-                      . Sister in Charge's sig. M-                      . E/N-                      . Doctor's sig. M-                      . E/N-                      .

# Remdesivir

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- **Q. What is Remdesivir?**
  - **Repurposed antiviral drug -an inhibitor of viral RNA dependent RNA polymerase.**
- **Q. When to use?**
  - **Moderate disease with spO2 <95% in room air with increasing Oxygen demand**
  - **Radiographic infiltrates by imaging like chest by X Ray or CT scan**
- **Q. What is the dosage?**
  - **200mg on day 1 then 100mg OD for 4 days IV infusion**
- **Q. What are the side effects?**
  - **Anemia, AKI , Liver dysfunction**
- **Q. What are the contraindications?**
  - **SGPT > 5 TIMES**
  - **Crcl < 30 ml/min**
  - **Hypersensitivity**
  - **Pregnancy/lactation**
  - **Children <12 yrs**
  - **Q. What are the precautions?**
  - **Not to be used after 10 days from onset of illness**
  - **Perform LFT at baseline and on alternate days**

# Corticosteroids

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- **When to use systemic steroids ?**
  - **Moderate disease with increasing O<sub>2</sub> demand or inflammatory markers**
  - **Severe disease**
- **What are the types of steroids?**
  - **Dexamethasone long acting**
  - **Methylprednisolone intermediate acting**
  - **Hydrocortisone short acting**
- **For these drugs, the total daily dose equivalencies to dexamethasone 6 mg (oral or intravenous [IV]) are:**
  - **Prednisone 40 mg**
  - **Methylprednisolone 32 mg**
  - **Hydrocortisone 160 mg**

# What is the dosage and duration of therapy?

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- **Depends on severity of disease**
- **Moderate disease**
  - **Dexamethasone-0.1 to 0.2 mg/kg/day oral/IV for 5-7 days**
  - OR**
  - **Methylprednisolone 0.5 to 1 mg/kg/day orally or IV for 5-7 days**
- **Severe disease**
  - **Dexamethasone- 0.2 to 0.4 mg/kg/day for 7 to 10 days**
  - OR**
  - **Methylprednisolone- 1 to 2 mg/kg/day for 7 to 10 days**
- **What caution is to be exercised during steroid therapy?**
  - **Larger dosage and longer duration is to be avoided**
  - **Monitor BP, blood glucose levels**
- **What are the side effects of steroids?**
  - **GI irritation**
  - **Altered BP control**
  - **Susceptibility to infections (keep in mind CAM)**
  - **Aggravation of hyperglycemia**
  - **Na and fluid retention**

# Inhaled steroids

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- Indication:
  - I. When cough persists beyond 5 days of illness
  - II. Comorbidity- asthma, COPD, atopic disease (nasal bronchial allergy)
  - III. Clinical symptoms like wheeze, chest tightness etc.
- Medication:
  - Inhaled Budesonide
  - Dose: 400 microgram 2 puffs twice daily for 5 to 7 days.



# Tocilizumab

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- **Off label use, experimental Monoclonal antibody against IL6 receptor**
- **When to use**
  - **Certain hospitalized patients who are exhibiting rapid respiratory decompensation due to COVID-19.**
  - **Recently hospitalized patients (i.e., within first 3 days of admission) who have been admitted to the intensive care unit (ICU) within the prior 24 hours and who require invasive mechanical ventilation, noninvasive ventilation, or high-flow nasal canula (HFNC) oxygen (>0.4 FiO<sub>2</sub>/30 L/min of oxygen flow) *or***
  - **Recently hospitalized patients (i.e., within first 3 days of admission) not admitted to the ICU who have rapidly increasing oxygen needs and require noninvasive ventilation or HFNC oxygen and who have significantly increased markers of inflammation (CRP ≥75 mg/L)**
- **Dose:**
  - **Single intravenous [IV] dose of tocilizumab 8 mg/kg actual body weight up to 800 mg in combination with dexamethasone**
- **What are the side effects?**
  - **Infections, headache, increased AST/ALT, high BP, mouth ulcer, gastritis**
- **What are the contraindications?**
  - **Infections, latent / clinical TB, platelet <1 lac, neutrophil count <2000/cu mm, AST/ALT > 5 times normal, pregnancy, lactation**
- **USE TO BE APPROVED BY THE EXPERT COMMITTEE OF THE HOSPITAL**

# ANTICOAGULANTS

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## ➤ Q. Whom to start?

- Patients who are receiving anticoagulant or antiplatelet therapies for underlying conditions should continue these medications if they receive a diagnosis of COVID-19.
- Parenteral anticoagulants are indicated in any acutely ill hospitalised patients. Hence, it is indicated in moderate, severe and critical disease.

## ➤ Q. What to use?

- i. LMWH/fondaparinaux is preferred over UFH, due to lesser patient contact of healthcare staff and no need of aPTT monitoring (necessitating patient contacts).
- ii. Enoxaparin is the most preferred LMWH.
- Unfractionated heparin is contraindicated in patients with severe thrombocytopenia. Fondaparinux is recommended in patients with a history of heparin-induced thrombocytopenia.

## ➤ Q. What is the dose?

- i. Moderate disease (standard risk patient): standard weight-adjusted prophylactic dose (eg, enoxaparin 40mg once daily for a 70 kg adult with CrCl >30mL/min).
- ii. Severe and critical disease (high-risk patient: requiring invasive ventilation/continuous positive airway pressure (CPAP)/non-invasive ventilation (NIV)/high-flow nasal oxygen): intermediate dose LMWH (enoxaparin 40mg two times per day for a 70kg adult with CrCl >30mL/ min).
- iii. Diagnosed/highly suspected macrothrombosis (PE/DVT): therapeutic dose (enoxaparin 1mg/kg 12 hourly subcutaneous or 1.5mg/kg subcutaneously once daily).

# Supportive measures

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- **Avoid lying on their back as this makes coughing ineffective.**
- **Use simple measures first (e.g., a teaspoon of honey in patients ages 1 year and older) to help cough. A meta-analysis found that honey is superior to usual care (e.g., antitussives) for the improvement of URTI symptoms, particularly cough frequency and severity.**
- **Adequate nutrition and appropriate rehydration.**
- **Drink fluids regularly to avoid dehydration. Fluid intake needs can be higher than usual because of fever. However, too much fluid can worsen oxygenation.**
- **Improve air circulation by opening a window or door.**
- **Provide basic mental health and psychosocial support for all patients, and manage any symptoms of insomnia, depression, or anxiety as appropriate**

# Antigen test

- Relies on direct detection of SARS-CoV-2 viral proteins in nasal swabs and other respiratory specimens using a lateral flow immunoassay.
- Results are usually available in less than 30 minutes.
- If used, testing should occur within the first 5 to 7 days following the onset of symptoms.
- In a Cochrane review:
  - a. sensitivity was higher in the first week after symptom onset in symptomatic people (78.3%), compared with the second week of symptoms (51%).
  - b. Sensitivity was higher in those with RT-PCR cycle threshold values  $\leq 25$  (94.5%), compared with those with cycle threshold values  $> 25$  (40.7%).
  - c. Sensitivity was higher in symptomatic people (72%), compared with asymptomatic people (58.1%).Sensitivity also varied between brands of tests.

## Real-Time reverse transcription Polymerase Chain Reaction (RT-PCR) -which specimen?

Upper respiratory specimens (nasopharyngeal and/ or oropharyngeal swabs) for early-stage infections, especially asymptomatic or mild cases

Lower respiratory specimens (sputum and/or endotracheal aspirate or bronchoalveolar lavage in patients with more severe respiratory disease):

A) for later-stage infections or

B) patients in whom there is a strong suspicion for infection and their upper respiratory tract specimen test was negative.

# TRIAGE

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**Due to the limited number of ICU beds, triaging is essentially necessary.**

- **Severity of illness**
- **Age and functional status**
- **Co-morbid disease**
- **Physiological reserve**
- **Prognosis**
- **Availability of suitable treatment**
- **Response to treatment to date**
- **Recent cardiopulmonary arrest**
- **Anticipated quality of life**

# Community Network

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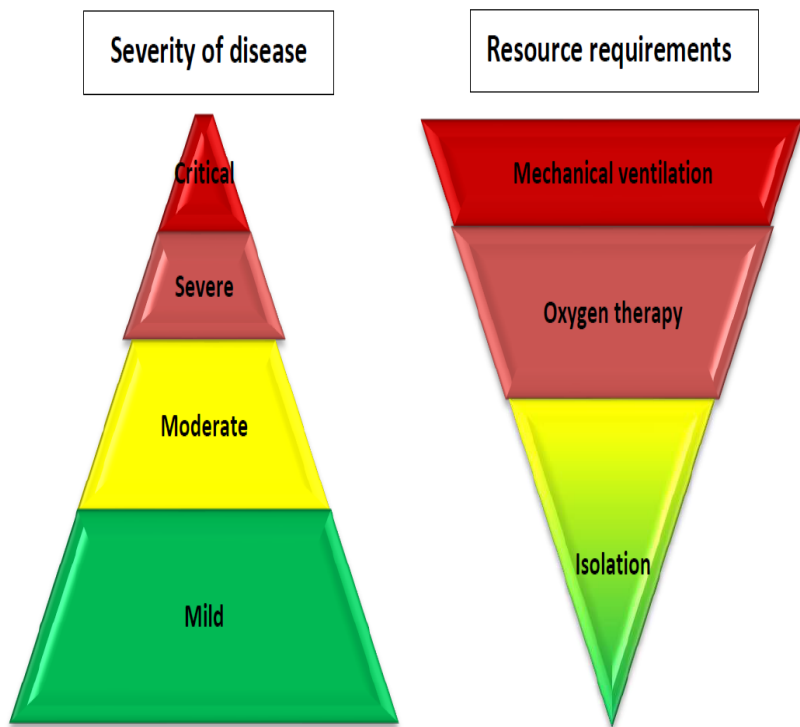
- For referrals to adopt a “hub and spoke” model, with a central COVID-19 referral facility and all other health facilities in each geographical area referring patients to the nearest centre
- To manage all mild and low- to moderate risk patients with confirmed disease in designated community facilities (e.g. stadium, gymnasium, hotel or tent)
- If patient develops symptoms that may correspond to severe disease or complications, ensure rapid referral to hospital
- To develop community coordinated network with local government authority, public health unit/district medical officer, prehospital care services (including community health workers, community first aid responders, ambulance services) and hospitals.
- To establish or reinforce screening and triage protocols at all points of first access to the health system, including primary health care centres, clinics, and hospital emergency units.
- To ensure that each facility is able to implement basic emergency care (BEC) for seriously ill patients and then activate referral
- COVID-19 treatment areas should be designed to deliver life-saving oxygen therapy.
- Most patients hospitalized with severe disease will need oxygen, and a smaller proportion will require ventilation

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# Resource Management

Operational considerations for case management of COVID-19 in health facility and community:



Countries will experience one or more of these situations at the subnational level and must tailor their approach to the local context.

1. Countries with no cases (no cases);
2. Countries with one or more cases, imported or locally acquired (sporadic cases);
3. Countries experiencing cases clusters in time, geographic location, or common exposure (clusters of cases);
4. Countries experiencing larger outbreaks of local transmission (community transmission).

“The most important thing in communication is hearing what isn’t said.”

– *Dr. Peter F. Drucker*

