



## **Case Treatment Protocol For COVID-19 Patients**

This protocol is developed on 16<sup>th</sup> March 2020 and will be updated regularly (in footer)

This document is developed by members of the Case Management Committee in the Federal Ministry of Health (FMOH) to provide guidance to frontline clinicians caring for patients' with COVID-19.

The FMOH's view at this stage is to manage all suspected or confirmed cases at the isolation centers to limit the community spread and flatten the curve. As the epidemic progress with increasing number of cases, more use of home isolation will be practiced.

All hospitals should assign a dedicated area for isolation and management of patients with suspected COVID-19 infection till a decision to discharge or transfer to an isolation center is made.

### **Clinical Syndromes Associated with COVID-19 Infection:<sup>1</sup>**

#### **1- Mild Disease - Uncomplicated URTI:**

- Severity score of 0-4
- Patient with uncomplicated upper respiratory tract infection OR Atypical symptoms or GIT symptoms .
- Nonspecific symptoms such as fever, cough, sore throat, nasal congestion, malaise and headache.
- The elderly and immune compromised may present with atypical-symptoms.
- Patient doesn't have any signs of dehydration, sepsis, or shortness of breath.

#### **Management:**

- Symptomatic support– antipyretics for fever, hydration, and rest.
- Supplemental vitamin C 1000 unit daily, Vitamin D dose 25 microgram daily (1000U), Zinc dose 15mg daily and minerals
- Check suitability for home isolation (checklist and hand-out).
- Start Hydroxychloroquine 400mg BD loading dose then 400mg daily for total of 5 days.
- Doxycycline 100 mg and for 5 days

#### **2- Moderate Disease - Uncomplicated pneumonia:**

- Severity score of 0-4
- Patient with higher clinical suspicion for pneumonia, or evidence of pneumonia on CXR (typically bilateral ground glass opacities) or HRCT
- O<sub>2</sub>saturation >92% on room air.

---

<sup>1</sup> Presentation in elderly may be Atypical and need to be considered separately



Republic of the Sudan  
Federal Ministry of Health  
General Directorate of Curative Medicine

---

**Management:**

- Symptomatic support as mentioned above.
- Check suitability for home isolation, otherwise admit to isolation center.
- Give empiric antibiotics based for CAP pneumonia; recommend Amoxicillin 500mgTDS for 5 days + Azithromycin 500mg daily for 3 days.
- If bronchodilator treatment is required, provide Metered Dose Inhalers and spacers instead of nebulizers to prevent aerosolization of the virus.
- Start Hydroxychloroquine 400mg BD loading dose then 400mg daily for total of 5 days.
- Doxycycline 100 mg and for 5 days
- daily OR adjusted dose according to renal function ,If admitted the patient
- Add VTE prophylaxis (Recommend Enoxaparin (low molecular wt heparin) 40 mg subcutaneous daily OR adjusted dose according to renal function ,can substitute with UFH 500 units BD for CRD patients.

**3- Severe Disease- Severe pneumonia:**

- Patient severity score of 5-7.
- Patient with Pneumonia, changes suggestive of COVID lung on CXR.
- O<sub>2</sub>Saturations <92% on room air.
- Patients are typically in respiratory distress with an increased respiratory rate.

**Management:**

- Admit to isolation center.
- Provide supplemental O<sub>2</sub>to achieve O<sub>2</sub>saturations>94%
  - Nasal cannula
    - ✦ 20-40%oxygen
    - ✦ O<sub>2</sub> dose1-5L/min
  - Simple facemask
    - ✦ 40-60%oxygen
    - ✦ O<sub>2</sub> dose6-10L/min
  - Non-re breather facemask
    - ✦ 60-90%oxygen
    - ✦ O<sub>2</sub> dose10-15L/min
    - ✦ Ensure proper fit, to reduce risk of aerosol spread.
- May deteriorate rapidly: so monitor O<sub>2</sub>saturation and vital signs; escalate oxygen dose and delivery device if hypoxia remains with maximal oxygen doses.
- Give empiric antibiotics for severe CAP pneumonia, Ceftriaxone 1gm OD + Azithromycin 500mg daily for 3 days.



Republic of the Sudan  
Federal Ministry of Health  
General Directorate of Curative Medicine

---

- For underlying lung disease e.g Bronchiectasis: consider antipseudomonal antibiotic instead of Ceftriaxone
- Suspected aspiration : 2<sup>nd</sup> or 3<sup>rd</sup> generation cephalosporin and Clindamycin or Metronidazole
- Consider Dexamethone 6mg tabs or I.V. for 10 days  
(If pregnancy women please refer to pregnancy protocol-hydrocortisone 80mg twice per day)
- Provide modifiable prone positioning, which is found to be beneficial and reduces the need for invasive ventilation.
- Consider other laboratory testing ( Ferritin ,serum IL and D-dimer and LDH)
- Consider HNFC and NIV in designated area to minimize the risk of aerosol generation spread.
- Begin arranging for transfer to higher level of care as needed.
- Consider antiviral medications –Favipiravir / Remdesivir in case by case basis on discretion of treating team and consultation with ID Specialist.
  - Add VTE prophylaxis (Recommend Enoxaparin (low molecular wt heparin) 40 mg subcutaneous daily OR adjusted dose according to renal function. Can substitute with UFH 500 units BD for CRD patients.

#### 4- Critical Disease - Sepsis/shock and Respiratory failure

- Severity score of 8 or more.
- Hypoxemic respiratory failure, Acute Respiratory Distress Syndrome (ARDS), and/or shock

Life threatening organs dysfunction, altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, tachycardia, weak pulse, thrombocytopenia, acidosis, impaired LFT (hyperbilirubinemia)

##### Management:

- Endotracheal intubation and mechanical ventilation to manage ARDS
  - Should be performed with air-borne precautions by the most experienced clinician, with Rapid Sequence Intubation
  - Use low flow non-rebreather masks or masks with reservoir bags to oxygenate prior to intubation. Using a bag valve mask is **NOT** recommended as it can aerosolize the virus and increase spread.
  - Mechanical ventilation goals:
    - ✦ SpO<sub>2</sub> is >90%
    - ✦ Tidal volumes of 4-8mL/kg
    - ✦ Inspiratory pressures < 30cmH<sub>2</sub>O



Republic of the Sudan  
Federal Ministry of Health  
General Directorate of Curative Medicine

---

- ECG and laboratory testing ( Ferrtine ,serumIL and D-dimer and LDH) to monitor for complications including myocarditis, acute kidney injury, liver injury, and shock.
- Test and treat co-infections if possible, including influenza or other viruses, malarial blood tests, and blood cultures
- Consider Piperacillin /Tazobacatm or Meropenem plus Azithromycin
- If concern forMRSA:add Vancomycin or Linezolid
- If shock is present, use conservative fluid management – aggressive fluid resuscitation may worsen oxygenation
  - 250-500 mL normal saline or lactated ringers as rapid bolus
  - Monitor for signs of fluid overload before giving additional bolus
  - Administer vasopressors if shock persists
    - ✦ goal MAP >65mmHg
    - ✦ If central lines are not available, give through peripheral IVs with monitoring for extravasation and local tissue necrosis
    - ✦ Nor-adrenaline is the first-choice vasopressor
    - ✦ Adrenaline is the second to be added.
    - ✦ Consider antiviral medications, immune modulators in case by case based on discretion of treating team, specialist and consultation
    - ✦ In patients with low risk of bleeding consider Half or full dose anticoagulation.

- Serum IL-6  $\geq 3x$  upper normal limit
- Ferritin >300 ug/L (or surrogate) with doubling within 24 hours
- Ferritin >600 ug/L at presentation
- LDH more than 250
- Elevated D-dimer (more than 1 mcg/mL)

### Collection of specimens for laboratory diagnosis:

- Collect blood cultures for bacteria that cause pneumonia and sepsis, ideally before antimicrobial therapy, **DO NOT** delay antimicrobial therapy to collect blood cultures.
- Collect specimens from both the upper respiratory tract (URTI; nasopharyngeal and oropharyngeal) and lower respiratory tract(LRT; Expectorated sputum, endotracheal aspirate, Broncho alveolar lavage) for nCOV testing by RT-PCR, Clinicians may elect to collect only LRT samples when these are readily available (for example in mechanically ventilated patients).



Republic of the Sudan  
Federal Ministry of Health  
General Directorate of Curative Medicine

---

**Additional Supportive Measures:**

- Optimize nutritional support
- Rationalize medications and guard against interactions
- Consider VTE prophylaxis in all admitted patients with no contraindication.
- Convalescent plasma ( in selected patients early in the course of the disease) rather than “critical cases”.

**Specific Anti-Novel-CoV Treatments and Clinical Research:**

- There is currently scarce evidence to recommend specific treatment. Clinical trials are highly encouraged to advance medical knowledge for this pandemic as well as future epidemics.
- Use of Hydroxychloroquine has been trialed in pilot studies, evidence is promising and further information might appear soon. Given the good safety profile hydroxychloroquine have been advised to help mitigate the risk of severe lung injury and clinical deterioration. This part will be updated once new evidence arise.
- Promising result appear for use of Favipiravir in moderate to severe case and Remdesivir for severe and critical cases
- Emerging evidence support the use of Convalescent plasma infusion for critically ill patients.
- Uses of antiviral and /or immune modulators are to be discussed with ID/Microbiologist on case by case bases or through clinical trials.
- FMOH is encouraging researchers and clinicians to come forward.

**Special Considerations for Pregnant and Lactating Women:**

- For pregnant women suspected of COVID-19 or confirmed and due for labor, to deliver in isolation centers.
- Isolation centers should be equipped with a surgical setup.
- If operation room not available, deliver in nearest facility and adhere to infection control measures.
- Lactating mothers should continue to breastfeed her infant/young child while taking all infection prevention precautions.
- If condition of mother deteriorates then separate child from mother and extract breast milk for feeding infant/young child.
- A midwife should be present in every isolation center.
- A nutritionist should be present in every isolation center.



Republic of the Sudan  
Federal Ministry of Health  
General Directorate of Curative Medicine

---

**Nutritional guidance during the isolation period for children age 6-59 months:**

- The trained health care provider conducts MUAC screening for all children and if the child is classified;
  - Severe Acute Malnutrition (SAM), should apply the SAM protocol for treatment.
  - Moderate Acute Malnutrition (MAM), should apply the MAM protocol for treatment.
  - Child without Acute Malnutrition, should provide Vitamino / plumpydoz.

Healthy children without malnutrition, should give **one** preventive dose of Vitamin (A), if she/he did not take any dose during the previous **six** months.

**General nutritional guidance during the Isolation period:**

- Drink water in sufficient quantities constantly.
- Drink liquids which contain Vitamin C, such as lemon/ orange/ grape fruit/ guava/baobab and hibiscus local juices.
- Eat healthy and balanced food throughout the day, which contains carbohydrates, proteins, fats, vitamins and minerals.
- Focus on eating a variety of vegetables and fruits, especially ones which contain zinc, vitamin D and iron, to strengthen the immune system.



**Republic of the Sudan**  
**Federal Ministry of Health**  
**General Directorate of Curative Medicine**

**Staff to use standard PPE + assess the patient in dedicated respiratory illness area of the hospital:**

<b>Presentation</b>	<b>Features</b>	<b>Management &amp; intervention</b>
<b>Mild disease</b>	URTI Severity score 0-4	<ul style="list-style-type: none"> <li>-Assess vitals and concerns</li> <li>-Take Nasopharyngeal swabs for SARS-Cov2 PCR</li> <li>-Simple antipyretics Paracetamol.</li> <li>- start hydroxy-Chloroquine 400mg BD for 1 day followed by 400mg for total of 5 days</li> <li>- Doxycycline 100 mg and for 5 days</li> </ul>
<b>Moderate disease</b>	Pneumonia without oxygen support Severity 0-4	<ul style="list-style-type: none"> <li>-Assess Vitals, Focused exam, PMH and Medication history</li> <li>- NPS for SARS-Cov2 PCR</li> <li>-treat empiric CAP (Amoxicillin 500mg TDS+ Azithromycin 500mg daily for 3 days)</li> <li>- start hydroxy-Chloroquine 400mg BD for 1 day followed by 400mg for total of 5 days</li> <li>- Doxycycline 100 mg and for 5 days</li> <li>- Enoxaparin (low molecular wt heparin) 40 mg.</li> </ul>
<b>Severe disease</b>	Severe Pneumonia with oxygen requirement Severity score 5-7	<ul style="list-style-type: none"> <li>-Assess Vitals, Focused exam, PMH and Medication history</li> <li>-NPS for SARS-Cov2 PCR</li> <li>-Admit to a Monitored bed</li> <li>-Supplemental oxygen Keep saturation &gt;92%</li> <li>-Empiric severe CAP (Ceftriaxone 1Gm OD +Azithromycin 500mg OD)</li> <li>- Dexamethone 6mg tabs or I.V. for 10 days</li> <li>- Enoxaparin (low molecular wt heparin) 40 mg\OD</li> <li>-Specialist consultation for considering antivirals/immunomodulators.</li> </ul>
<b>Critically ill</b>	Sever Sepsis/Respiratory failure Severity Score >8	<ul style="list-style-type: none"> <li>-ABCD support</li> <li>-Treat as severe sepsis</li> <li>-ICU bed</li> <li>-Don't delay I&amp;V once optimise Haemodynamic with fluids and pressors</li> </ul>



**Note:**

Considering minimal risk upon use, a long experience of use in other diseases, cost-effectiveness and easy availability, we propose that HCQ is worthy of fast track clinical trial for treatment, and may be carefully considered for clinical use as experimental drug for mild and moderate cases while awaiting further high grade evidence.

**Discharge criteria:**

Discharge from hospital is a clinical decision depending upon:-

1. Absence of need for close monitoring or hospital-delivered treatment (services) eg. oxygen **AND**
2. Reduced (low) probability of further deterioration.

Upon discharge patients are advised to continue transmission-based precautions.

Decision to discontinue transmission-based precautions depends on the following:

A. For symptomatic patients, decision depends on **BOTH** type and duration of symptoms:

1. Absence of fever for 3 days without use of antipyretics **AND** improvement in respiratory symptoms eg: cough, SOB...
2. Duration of at least 14 days from start of symptoms.

B. For asymptomatic patients (confirmed or suspected), decision depends on either:

1. 14 days from time of first positive test (for confirmed cases) **OR**
2. 14 days of suspected contact or breach in PPE (without testing)

**Note:** Positive cases could shed the virus for longer durations; however detecting viral RNA via PCR **DOES NOT** necessarily mean the infectious virus is present, as detected by viral cultures. **These guidelines follow theaters update by the CDC.**

- Adhere to all standard infection control measures to prevent disease transmission.
- Advice to wear the mask if there is cough even after two weeks of recovery.