Management Guidelines for COVID-19

July 2021

This set of management guidelines for COVID-19 disease is based on available reference materials and existing clinical practice experience. It is intended for clinicians and health care workers in facilities assigned to provide care for patients with COVID-19 disease. In an outbreak or a wave of the infection, incoming caseload may be high and put a strain on the human resources as well as systems and supplies of a health facility.

Some COVID-19 patients may have mild to moderate form of disease and can be cared for in a home or community setting or as out-patient while others will present with severe type of illnesses requiring hospital admission. As the disease is a relatively new one with limited understanding on it, and the disease process is dynamic in nature changing from mild or moderate to severe in a short time frame, in-time assessment and adaptation of management are key in care of the COVID-19 patients.

I. History template

Name: ------------------- Age: -------------------
Sex: ------------------- Case #: -------------------
Address: ----------------------------------
Travel History: ----------------------------------
History of Contact: ----------------------------------
Presenting Symptoms
Fever…… Cough …… Sore throat……. Nasal congestion…… Shortness of breath ……
Fatigue…… Myalgia …… Headache…… Anorexia …… Nausea and Vomiting ……
Diarrhoea….. Loss of smell…… Loss of taste…… Sensorium change……

II. Physical Examination

GCS…… Temperature…… BP…… HR…… SpO₂…… RR…… Lungs……

III. Risk factors for disease progression

- Age: > 60 years
- Comorbidities: diabetes, hypertension, cardiac disease, chronic lung disease, cerebrovascular disease, chronic kidney disease, immunosuppression and cancer
- Smoking
- Obesity

IV. Severity of cases

Mild case
- Symptomatic patients without the features of viral pneumonia or hypoxia
Moderate case
- Clinical signs of pneumonia (fever, cough, dyspnoea, rapid breathing)

Severe case
- Clinical signs of pneumonia (fever, cough, dyspnoea, rapid breathing) plus one of the following features: RR > 30/min; severe respiratory distress; or SpO2 <93% on room air

Critical case
1. Acute Respiratory Distress Syndrome (ARDS)
   - New or worsening of respiratory symptoms.
   - Imaging of chest (CXR or CT scan): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules.
   - Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload.

2. Sepsis
   - Acute life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection.
   - Signs of organ dysfunction: including altered mental status, difficult or fast breathing, low oxygen saturation, oliguria, tachycardia, low volume pulse, hypotension, cold extremities, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia.

3. Septic shock
   - requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level >2 mmol/L.

4. Other complications
   - Acute pulmonary embolism
   - Acute coronary syndrome
   - CVA and delirium

Mild and moderate cases can be managed as out-patients or with home care while severe and critical cases need hospital admission and even intensive care.

V. Investigations
Patients who are admitted to hospital need some investigations.
- Test for SARS-CoV-2 virus by RDT or GeneXpert® and RT-PCR if available.
- Detect malaria parasites – by RDT or blood film in endemic areas if indicated.
- Dengue - may be a differential diagnosis of undifferentiated febrile illness, particularly when thrombocytopenia is present.
- CP, RBS, U&E, Creatinine, ECG, CXR (PA)
- If possible, CRP, D-Dimer, LDH, ABG
VI. Treatment

Treatment of mild COVID-19 cases
- Isolate the patients at home to contain virus transmission.
- Symptomatic treatment such as antipyretics (paracetamol) for fever and pain.
- Adequate and appropriate nutrition.
- Counsel about signs and symptoms of complications that should prompt urgent care.
- Antibiotic therapy/prophylaxis is not recommended.

Treatment of moderate COVID-19 cases
- Isolate the patients at home to contain virus transmission.
- Antibiotics if there is clinical suspicion of bacterial infection.
- Monitor the patients for signs and symptoms of disease progression.
- Those with risks of disease progression may need hospital admission even though with moderate severity.
- **Familiarize patients** with measuring BP using digital cuff, temperature using infrared thermometer, oxygen saturation and heart rate using SpO$_2$ device.
- For mild and moderate cases, explain about signs/symptoms of disease **progression/complications** and to report to clinicians if those are felt or found. Especially, if the patient becomes dyspneic and SpO$_2$ < 93%.

Treatment of severe COVID-19 cases
- **Supplemental oxygen therapy**
  - Supplemental oxygen 3 - 5 litre/minute (nasal prong) to 15 litre/minute (face mask with reservoir bag); titrated with the response.
  - For those who need oxygen supplementation, consider prone positioning.
- Monitor for signs of deterioration, such as rapidly progressive respiratory failure and shock.
- Cautious fluid management.
- Use of empiric antimicrobials to treat all likely pathogens, based on clinical judgment, patient host factors and local epidemiology, within 1 hour of initial assessment if possible.

For patients with ARDS
- ICU management for respiratory support if available

For patients with septic shock
- 250-500 ml crystalloid fluid as rapid bolus in first 15-30 minutes
- Avoid hypotonic crystalloids, starches or gelatins for resuscitation
- Administer vasopressors (Noradrenalin) when shock persists during or after fluid resuscitation to reach MAP 65 mmHg
- Consider Dobutamine if sings of poor perfusion and cardiac dysfunction persists despite achieving MAP target with fluids and vasopressors

Prevention of complications in hospitalized and critically ill cases
- For prophylaxis of venous-thromboembolism, consider LMWH (low molecular-weight heparin) 0.4 mg OD or unfractionated heparin 5000 units subcutaneously twice daily) in cases without contraindications. Attending physician should adjust the
dose and duration of anticoagulation. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices).

- Turn patient every two hours
- Awake proning position may reduce ICU admission.
- Early enteral nutrition (within 24–48 hours of admission).
- PPI in patients with risk factors for GI bleeding.
- Early mobilization in the course of illness when safe to.

**Awake Prone Guide**

<table>
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NB: The abdomen should hang free and not be compressed. This is even more important in obese patients.

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<td>Leave oxygen mask in place – do not try and wean down immediately. Improvement of oxygenation with proning may take many hours to manifest. Head turned to left or right – whatever is comfortable for the patient.</td>
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**Immunomodulators and Anti-virals for COVID-19 Disease**

**Dexamethasone**
- It is recommended for patients with **severe disease whose SpO2 <93% on room air**.
- Dose - 6 mg IV or orally daily for 7-10 days.
- It should not be used for **either prevention or treatment of mild to moderate COVID-19 (not on oxygen supplementation)**.

**Remdesivir**
- It can be used in hospitalized patients with severe COVID-19

*Standard Operating Procedure (SOP) for use of Remdesivir*

**Candidate for Remdesivir**
Hospitalized patients with confirmed COVID-19 disease who should meet the following criteria:
- Age ≥ 18 year who has consented **and**
- Symptom **onset of within 10 days and**
- **Pulmonary infiltrates or pneumonia** on CXR **or**
- Needing supplemental oxygen therapy with **oxygen saturation of ≤ 93% on room air**

**Contraindications**
- Hypersensitivity to remdesivir or any component of the formulation
- eGFR <30 mL/minute, unless the potential benefit outweighs the potential risk
- ALT ≥5 times the upper limit of normal (and should be discontinued if it rises above this level during treatment or if there are other signs of liver injury such increasing conjugated bilirubin/ALP/INR)

**Adverse reactions**
- Endocrine and metabolic: hyperglycemia
- Hepatic: increased serum ALT/AST
- Renal: Acute renal failure
- Miscellaneous: fever, infusion related reactions (nausea, vomiting, diaphoresis, shivering)

**Drug Interactions**
- Chloroquine: May diminish the therapeutic effect of Remdesivir
- CYP3A4 Inducers (Strong): May decrease the serum concentration of Remdesivir
- Hydroxychloroquine: May diminish the therapeutic effect of Remdesivir

**Dosing**
*Intravenous injection*: 200 mg on day 1, followed by 100 mg once daily
*Administration*: IV infusion over 30 to 120 minutes. Flush line with at least 30 mL of normal saline after remdesivir infusion is complete
*Duration*: 5 days
### Infusion Bag Volume

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<tr>
<th>Infusion Bag Volume</th>
<th>Infusion Time</th>
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<tbody>
<tr>
<td>250 ml</td>
<td>30 min</td>
<td>8.33 ml/min</td>
</tr>
<tr>
<td></td>
<td>60 min</td>
<td>4.17 ml/min</td>
</tr>
<tr>
<td></td>
<td>120 min</td>
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**Dosing: Renal Impairment**
- eGFR ≥30 mL/minute: No dosage adjustment necessary
- eGFR <30 mL/minute: Use not recommended unless potential benefit outweighs potential risk

**Dosing: Hepatic Impairment**

*Baseline hepatic impairment:*
- There are no dosage adjustments provided; not recommended to be used in patients with baseline ALT ≥5 times the ULN

*Hepatotoxicity during therapy:*
- ALT ≥5 times the ULN: Discontinue remdesivir; may resume when ALT is <5 times the ULN
- ALT elevation AND signs or symptoms of liver inflammation or increasing conjugated bilirubin, alkaline phosphatase, or INR: Discontinue remdesivir

**Treatment of Non Communicable Diseases in COVID-19 Cases**
- Continue or modify previous medical treatment according to the patient’s condition to avoid drug interactions and adverse events.
- Attending medical doctor should adjust therapy to maintaining normal blood pressure and renal function.
- For patients with co-morbid diseases
  - Continue their current medications (e.g., ACE inhibitors can be continued if patient is already on it and condition is stable; however, ACEI should not be started if not on already).
  - Clinicians should be aware of liver function impairment in COVID-19, in adjusting medications according to LFT.
- For patients with diabetes mellitus:
  - Asymptomatic and stable patients, continue previous medications except SGLT2 Inhibitors.
  - Mild to moderately severe but stable patients, continue previous medications except SGLT2 Inhibitors and Metformin.
  - Severe cases, insulin should be given. In those who need insulin and are stable, Glargine/Mixtard insulin might be better because of less entry to isolation rooms.
- If getting worse, basal bolus regime is preferred. However, clinician should decide based on local settings. If organ involvements and intake insufficient, or in ICU, GKI should be considered.

**VII. Rehabilitation for patients with COVID-19**
- Routinely assess for mobility, functional, swallow, cognitive impairments and mental health concerns
• Determine discharge readiness, and rehabilitation and follow-up requirements

• Groups of patients who need above measures:
  ▪ patients that are in or have been discharged from intensive care;
  ▪ older patients that have experienced severe cases;
  ▪ patients that exhibit signs of any of these impairments.

VIII. Discharge criteria

1. For symptomatic COVID-19 confirmed patients:
   (a) Patients with mild or moderate illness who are not severely immunocompromised
      ▪ 10 days after onset of symptoms, plus at least 1 additional day without symptoms
        (including without fever with no antipyretics and without respiratory symptoms
        and other COVID-19 symptoms) provided that history of onset of symptoms is
        reliable.
   (b) Patients with severe to critical illness or who are severely immunocompromised
      ▪ 10 days after onset of symptoms, plus at least 4 additional days without symptoms
        (including without fever with no antipyretics and without respiratory symptoms
        and other COVID-19 symptoms)
      ▪ At least 20 days is recommended to stay in hospital.

2. For asymptomatic COVID-19 confirmed patients:
   ▪ 10 days after taking swab with positive test for SARS-CoV-2.

IX. References

- Infection prevention and control during health care when coronavirus disease (COVID-19) is
  suspected or confirmed, WHO Interim guidance, 29 June 2020.
- Coronavirus Disease 2019 (COVID-19) Treatment Guidelines, NIH.
- Infectious Diseases Society of America Guidelines on the Treatment and Management of
  Patients with COVID-19 https://www.idsociety.org/practice-guideline/covid-19-guideline-
  (Accessed on December 17, 2020).
- Coronavirus disease 2019 (COVID-19): Management in hospitalized adults, Kim AY and
Management of COVID-19 Cases in Resource Limited Settings

Based on the available reference materials, and existing clinical practice experience, this suggested guidelines for management of COVID-19 cases in resource limited settings is compiled. Depending on availability of facilities, actual services should be adapted.

**Initial Assessment and Care**


- **Physical examination**: including Temperature, HR, BP, RR, SpO₂

- **Investigations**: In resource limited settings, all the required investigations will not be available. However, CP, RBS, Creatinine and CXR are essential.
  - Test SARS-CoV-2 virus – by RDT, or GeneXpert® / RT-PCR if available.
  - Detect malaria parasites – by RDT or blood film in endemic areas if suspected.
  - Dengue - may be a differential diagnosis of undifferentiated febrile illness, particularly when thrombocytopenia is present.
  - CP, RBS, U&E, Creatinine, ECG, CXR (PA)

- **Categorize the severity** of illness into mild, moderate or severe and critical disease; to keep cases in separate rooms based on available facilities (e.g., severe cases and with co-morbidities in rooms with oxygen supply).

**Mild case**

- Symptomatic patients without the features of viral pneumonia or hypoxia

**Moderate case**

- Clinical signs of pneumonia (fever, cough, dyspnoea, rapid breathing)

**Severe case**

- Clinical signs of pneumonia (fever, cough, dyspnoea, rapid breathing) plus one of the following features: RR > 30/min; severe respiratory distress; or SpO₂ <93% on room air

**Critical case**

1. **Acute Respiratory Distress Syndrome (ARDS)**
   - New or worsening of respiratory symptoms.
   - Imaging of chest (CXR or CT scan): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules.
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2. **Sepsis**
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   - Signs of organ dysfunction: including altered mental status, difficult or fast breathing, low oxygen saturation, oliguria, tachycardia, low volume pulse, hypotension, cold extremities, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia.

3. **Septic shock**
   - Persistent hypotension despite volume resuscitation,
   - Requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level >2 mmol/L.

4. **Other complications**
   - Acute pulmonary embolism
   - Acute coronary syndrome
   - CVA and delirium

- Mild and moderate cases can be managed as out-patients or with home care while severe and critical cases need hospital admission and even intensive care.
- **Familiarize patients** with measuring BP using digital cuff, temperature using infrared (non-touch) thermometer, oxygen saturation and heart rate using SpO\(_2\) device.
- For mild and moderate cases, explain about signs/symptoms of disease progression/complications and to report to clinicians if those are felt or found. Especially, if the patient becomes **dyspnoeic** and SpO\(_2\) < 93%.

**Treatment of mild COVID-19 cases**
- Isolate the patients at home to contain transmission of the virus
- Symptomatic treatment such as antipyretics (paracetamol) for fever and pain
- Adequate and appropriate nutrition
- Counsel about signs and symptoms of complications that should prompt urgent care
- **Antibiotic therapy/prophylaxis is not recommended**

**Treatment of moderate COVID-19 cases**
- Isolate the patients at home to contain virus transmission
- Antibiotics if there is clinical suspicion of bacterial infection
- Monitor the patients for signs and symptoms of disease progression
- Those with risks of disease progression may need hospital admission even though with moderate severity.
- **Prescribe antibiotics** (Augmentin and Azithromycin orally if not contraindicated) to those with moderate disease and those having CXR changes (e.g., Ground Glass Opacity/pneumonitis, etc.).

**Treatment of severe COVID-19 cases**
- For severe cases with SpO\(_2\) < 93% on room air and those with severe/critical disease:
  - Supplemental oxygen 3 - 5 litre/minute to 15 litre/minute; titrated with response.
- Give PO or injection *Dexamethasone* 6 mg OD for 7 to 10 days.
- In severe cases, give antibiotics injection based on host factors, local antibiotic resistance pattern and clinical response.
- If ICU care is not accessible, patient monitor machine can be attached to them and seen through CCTV or remote monitoring more frequently.

- **For patients with co-morbid diseases,** continue their *current medications* (e.g., ACE Inhibitors can be continued if patient is already on it and condition is stable; however, ACEI should not be started if not on already). But clinicians should be aware of liver function impairment in COVID-19, to adjust medications according to LFT.

- **Patients with diabetes mellitus:**
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  - If getting worse, basal bolus regime is preferred. However, clinician should decide based on local settings. If organ involvements and intake insufficient, or in ICU, GKI should be considered.

**Further Assessments**

- Assess vital signs: GCS, Temperature, BP, HR, RR, SpO2, urine output) twice daily, but more frequently in patients with severe and critical disease.
- Repeat the blood tests (CP, LFT, Creatinine and CXR) in patients with lymphopaenia, deranged LFT and CXR abnormalities in their initial assessments. Laboratory and imaging assessment interval might be 5 to 7 days depending to patient severity, symptoms and availability.
- If D-dimer test is available, subcutaneous Enoxaparin (low molecular weight heparin) could be given for severe patients if there are no contraindications.
- RBS can be monitored daily/alternate day/twice a week depending on the situations, especially for those on Dexamethasone.
- Repeat ECG or ECG Monitor may be needed in patients with comorbid heart disease or sudden onset of chest pain, palpation and dyspnoea). In this situation, complications like acute coronary syndrome/pulmonary embolism/carditis can happen anytime.
- Involve, via VC or teleconferencing, of hepatologist, renal physician and cardiologist during the course of treatment in critically ill and multi-organ involvement.
Awake Proning Guide

**Aims**
Awake proning may reduce ICU admissions. Intubation in COVID19 has a high mortality. Patient must be awake and willing to comply.

**Duration**
Aim to remain prone for 4 hours periods. Allow 1 hour comfort breaks between periods of proning for eating, drinking, toilet and general comfort.

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