Case management protocol for Corona Virus Disease-19 (COVID-19) in Ethiopia

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Introduction
This protocol is intended mostly for clinicians taking care of hospitalized adult and pediatric patients with COVID-19 infection

It is not meant to replace clinical judgment or specialist consultation but rather to strengthen clinical management of these patients and provide up-to-date guidance.

General principle of clinical management for COVID-19

- Identify Severe/Critical cases at Triage then supportive treatment should start without delay.
- Apply strict IPC measures when managing patients starting from triage (contact, droplet and for other airborne precautions (Where applicable) should be applied.
- Specimens for detecting COVID-19 can be obtained from nasopharyngeal (NP) or oropharyngeal (OP) swabs or sputum (if produced) or lower airways in special conditions.
- Closely monitor patients isolated for COVID-19 infection.
- Underlying/chronic diseases should be identified as early as possible with detailed history from patient, close family members or friends.
- Drug interactions, adverse effects of drugs and drug allergies must be considered during managing the patient with COVID-19.
- Patient care should be with respect and dignity which include but not only limited to: medical support, food/water supply and accurate timely information.
  - Good manner of talking, caring, helping etc.
  - Food, water and other basic needs timely
  - Information should be given as requested

Specific treatments

- No proven anti-viral therapy or vaccine against COVID-19 so far necessitating supportive care for specific symptoms. In moderate to severe infection - use Chloroquine as immunomodulation for all patients and Chloroquine can be used for milder infections in patients who are older and with underlying diseases.
• Dose: Chloroquine phosphate 1000mg (4 tabs) stat, then 500mg (2 tabs) after 12 hrs, then 500mg (2 tabs) bid for 5 days.

**Management in specific conductions**

**Mild upper respiratory tract illness**

**Clinical features**

• Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain

• The elderly and immunosuppressed may present with atypical symptoms. These patients may not have any signs of dehydration, sepsis or shortness of breath.

**Management**

• Maintain standard Infection prevention and control procedures.

• Minimize contact with household members and provide surgical mask for the patient.

• Provide symptomatic therapies such as antipyretics and/or analgesics.

• Advice patients to keep hydrated, but not to take too much fluid as this can worsen oxygenation problems.

• Monitor patients closely and look out for worsening of their symptoms.

**Mild pneumonia**

**Clinical features**

• Patient with pneumonia and no signs of severe pneumonia.

• Child with mild-moderate pneumonia has cough or difficulty breathing + fast breathing:

• Fast breathing (in breaths/min): <2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40

**Management**

• As above + empiric oral antibiotics when needed; Amoxicillin 500mg po BID or Amoxicillin-clavulanate (Augmentin) 2 gm PO BID for 7-10 days + Azithromycin 500mg po for 3 days.

**COVID-19 Patients with severe Pneumonia or those who developed SARI**
• Provide oxygen supplementation with a target of $\text{SpO}_2 \geq 90\%$ for adults and $\text{SpO}_2 > 92-94\%$ for pregnant mothers and children.

• Conservative IV fluid management should be instituted.

• In COVID 19, superimposed bacterial infection is common and to treat all likely pathogens, antibiotics administration is common depending on the treating physician’s judgment.

• Empiric antimicrobials should be started after taking specimen for culture and sensitivity (preferably broad-spectrum antibiotics)
  
  o **Adults:** IV ceftriaxone 2 g once daily 5 days.
    
    • For patients who are critical, hospitalized, immunocompromised or have previous structural lung disorder: Cefazidime/Cefepime 2g iv Tid+or +/- Vancomycin 1 gm IV BID or + Azithromycin 500 mg po/d for 3 days
    
    • Meropenem 1g IV q8hours +/- vancomycin 1g IV q12 hours in critical patients if there is no response with the above alternative or culture and sensitivity result is suggestive.
    
    • IV metronidazole 500 mg three times/day can be added when aspiration pneumonia is suspected (usually 7 days).
    
    • When patients improve and are able to take PO, Amoxicillin-Clavulanate (Augmentin) 2 gm PO BID for 7-10 days
      
      o **Children:** IV ceftriaxone 50-100mg/kg daily in divided doses (usually for 7 days)

**Anti-pyretic and analgesics:**

**Adults:**

• **Paracetamol** 1 g paracetamol PO (using Nasogastric Tube (NGT)) every 6–8 hours. Maximum 4g/ 24hr

• **For analgesics purpose tramadol** 50–100 mg PO/IV every 4–6 hours as needed, daily maximum 400 mg/day can be given alternatively or combined with paracetamol.

**Children:**

• **Paracetamol** 10–15mg/kg every 6 hourly, maximum dose 60 mg/kg/day

• **Children > 6 months for analgesics purpose tramadol** 1–2 mg/kg every 4–6 hours, maximum 400 mg/day can be given alternatively or combined with paracetamol.
Close monitoring for signs of clinical deterioration such as respiratory failure, sepsis/septic shock has to be done for early management of such complications.

Management of patients with hypoxemic respiratory failure and ARDS

- Some patients fail to maintain oxygen saturation despite standard oxygen flow administration. Such condition is usually due to intrapulmonary ventilation-perfusion mismatch with hypoxemic respiratory failure.
- Clinical features of acute hypoxemic respiratory failure are: Dyspnea, Cyanosis, Confusion, Tachycardia, Tachypnea, use of accessory muscles, Nasal flaring, intercostals and subcostal retraction and altered mental status.
- Patients with COVID 19 infection develop acute respiratory failure 2 to ARDS

Acute Respiratory Distress syndrome (ARDS) is characterized by:

- Onset: new/worsening respiratory symptoms within one week
- Chest imaging: bilateral opacities not fully explained by other features like effusions, lobar opacity, lung collapse or nodules
- Origin of edema: respiratory failure not fully explained by cardiac failure or fluid overload
- Oxygenation: severe hypoxemia regardless of high oxygen input

Management of Acute Hypoxemic Respiratory Failure 2 to ARDS

- Oxygen via face mask with reservoir bag-flow rates 10-15l/min
- 2-HFNO/NIV should only be used in selected patients without comorbidities and for non-pregnant patients.
- Monitor closely for one hour and deliver invasive ventilation if patients acutely deteriorate or have no improvement.
- Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions.
- MV setting—low tidal volume (4-8 ml/kg), low inspiratory pressure, high PEEP
- If no improvement, consider prone ventilation.
Management of Septic Shock

Apply the **Six Sepsis Management Bundles** with in 1hr: appropriate fluid management, Oxygen delivery, antibiotics, sending specimen for culture and sensitivity, and monitoring of lactate and urine out-put hourly.

- **Immediate aggressive volume expansion with isotonic solution, preferably R/L or alternatively with N/S, is the main stay of treatment during septic shock.**
  - **Adults:** start with at least 30ml/kg in the first 3hrs, then additional fluid boluses.
  - **Children:** 20ml/kg as rapid bolus and up to 40-60ml/kg in the first 1hr.
  - Further fluid administration depends on the response to the previous fluid resuscitations.
  - Closely monitor for signs of fluid overload (jugular venous distension, crackles on lung auscultation, pulmonary edema on imaging, or hepatomegaly in children)
  - Stop or decrease fluid administration if signs of fluid overload are identified.
  - Watch also for signs of target perfusion achievement (Mean Arterial Pressure (MAP)>65 mmHg or age appropriate target for children, urine output (>0.5 ml/kg/hr in adults, 1 ml/kg/hr in children), and improvement of skin mottling, capillary refill, level of consciousness)

- **If target perfusion is not achieved or hemodynamic response is poor with standard fluid administration within one hour, start vasopressor administration.**

- **The vasopressor of choice in adults is norepinephrine (NE) (2-30 μg/min/ (0.1-1 μg/kg/min) but epinephrine (2-30 μg/min, (0.1-1 μg/kg/min) and dopamine (2-20 μg/kg/min) can be used respectively. Titrate dose based on response;**

- **For children, epinephrine (0.1–0.3 μg /kg/min) is the first-line vasopressor.**

- **Closely monitor the veins for any extravasations of vasopressors as it may cause tissue swelling and necrosis.**

- **Broad spectrum antibiotics should be administered for possible superimposed infection.**
  - **Adults:**
    - In patients who are critical, hospitalized, immunocompromised or have previous structural lung disorder: Ceftazidime/Cefepime 2g iv Tid +/-Vancomycin 1 gm IV BID
• meropenem 1g IV q8hours +/- vancomycin 1g IV q12 hours in critical patients if there is no response with the above alternative or culture and sensitivity result is suggestive

• When patients improve and are able to take PO, Amoxicillin -clavulanate (Augmentin) 2 gm PO BID for 7-10 days
  o **Children**: IV ceftriaxone 80mg/kg daily in divided doses (usually for 7-10 days)

• Other antibiotics can be administered based on the clinical judgment of the clinician

• Surgical drainage or debridement of an abscess or dead /necrotized tissue

• Blood transfusion if Hgb is ≤ 7mg/dl to keep adequate O2 saturation

• Collect CBC, organ function tests, electrolytes, and imaging results and act accordingly.

**Special considerations for pregnant patients**

• Pregnant women with suspected or confirmed COVID-19 should be treated with supportive therapies as described above, taking into account the physiologic adaptations of pregnancy.

• Emergency delivery and pregnancy termination decisions are based on many factors: gestational age, maternal condition, and fetal stability.

• Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential.

• To reduce the risk of transmission of the virus that causes COVID-19 from the mother to the newborn, the baby must be temporarily separated from the mother upon delivery.

• Family members who care for the baby must wear PPEs. If no family member is available, the mother must wear a medical mask and practice hand hygiene before each feeding or other close contact with her newborn.

• Mothers who intend to breastfeed must be encouraged to express their breast milk to establish and maintain milk supply.

**Prevention of complications**
• Further complication in patients already on supportive care may develop, so close monitoring and management is essential.
• Reduce days of invasive mechanical ventilation- (Use weaning protocols that include daily assessment for readiness to breathe spontaneously and plan early extubation)
• Reduce incidence of ventilator associated pneumonia-
  o Use oral ventilator instead of nasal ventilator and apply frequent succioning
• Reduce incidence of venous thromboembolism: low molecular-weight heparin [preferred if available] or heparin 5000 units subcutaneously twice daily) in adolescents and adults without contraindications
• Reduce incidence of pressure ulcers- frequent turning of critical patients in ICU, preferably every two hours.
• Reduce incidence of stress ulcers and gastrointestinal bleeding-
  o Early enteral nutrition (usually 24-48hrs after admission)
  o Pharmacological prophylaxis- histamine-2 receptor blockers or proton-pump inhibitors

**Discharge criteria for COVID-19 cases admitted to treatment center**

1. Patient diagnosed with COVID-19 pneumonia can be discharged when the symptoms have subsided, the body temperature remains at a normal range for at least three days, two consecutive laboratory tests are negative and radiological improvement. The two-time interval for testing will be within 24 and 48 hrs. respectively.

2. Any person who has contact with confirmed COVID-19 case has to be followed for 14 days:
   • If no symptoms develop within 14 days follow up, discharge the person from the follow up.
   • If symptoms develop during the 14 days follow up, admit the patient, treat and follow the same protocols to discharge.