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# COVID -19: CLINICAL MANAGEMENT PROTCOL

## Basic Principles

1. Establishment of a 24-hour helpline with competent volunteer to assess the severity of disease and identify patients who are candidates of home isolation and hospitalisation prescribe them appropriate medications and give them monitoring protocol and make them aware of red flag signs.
2. Hierarchical structure should be made starting CHC level → District Hospitals → Medical Colleges → Speciality Institutes.
3. Volunteers should have a written action plan to manage and take decision according to severity of case.
4. Categorize into A, B, C based on Symptoms, SpO2 & Respiratory Rate

## Management at Triage (Presumptive OR RT PCR Negative patients)

1. All patients presenting to the institute with acute febrile illness with suspicion of COVID will be primarily admitted and evaluated at the designated triage.
2. COVID-19 should be suspected as a possible etiology in all patients presenting to the institute with severe acute respiratory illness (SARI)
3. Screening and Triage:
    a. Standard IPC measures should be implemented at all times.
    b. All health care personnel should be donning full PPE during management of these patients.
    c. Immediate sample collection should be done and sent for COVID 19 testing by True Nat and RT-PCR
    d. If RT-PCR is positive the patient should be transferred to ICU or Isolation ward of RCH as applicable
    e. Baseline CBC, RFT, LFT, RBS, PT/INR, CXR, Urine R/M, LDH, Ferritin, CRP, procalcitonin, d-dimers, fibrinogen should be obtained.

4. All patients with acute febrile illness with respiratory localization, empirical therapy with broad spectrum antibiotics according to underlying comorbidity.
5. All patients with suggestive history and **ILI and hypoxemic respiratory failure** should undergo an HRCT thorax and CORADS scoring should be done. In CORAD ≥ 4: empirical Remdesivir 200 mg IV on Day 1 then 100 mg IV OD x 4days, prophylactic dose anticoagulation with LMWH (Enoxaparin/Dalteparin) and Dexamethasone 0.1 - 0.2 mg/kg OD may be started awaiting RT-PCR reports
6. Maintain adequate hydration.
7. Oxygen supplementation should be started with nasal prongs. If unable to maintain saturation
    a. Venturi Mask
    b. Non re-breathing reservoir bag masks
    c. High Flow nasal cannula
    d. Cautious trial of CPAP/NIV should be given as the therapeutic window in hypoxemic respiratory failure is exceedingly small.
    e. Use conservative fluid management in patients with Severe Covid when there is no evidence of shock.
    f. Mechanical ventilation - if unable to maintain saturation even on above measures, increased work of breathing or development of hemodynamic instability.
    g. Conventional ARDS Net strategy should be implemented.
8. High index of suspicion – Repeat COVID RT PCR should be obtained.

# COVID -19: CLINICAL MANAGEMENT PROTCOL

**Classification of Severity:**

The classification of severity is done on the basis of clinical and lab parameters:

1. **Category A – Mild disease**
   a. Patients with uncomplicated upper respiratory tract infection, may have mild symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache.
   b. Patients with RR < 20/ min, not requiring any oxygen supplementation (SpO2 > 94 % on Room Air) and normal CXR.
2. **Category B – Moderate disease**
   a. Patients features in category A with dyspnoea with or without exertion.
   b. Patients with RR > 24/min, SpO2 < 94% on Room Air
   c. CXR showing bilateral patchy homogenous/heterogenous opacities.

d. Laboratory criteria: (Any 2 of following criteria)
   1. CRP > 50 < 100
   2. Ferritin > 500 < 1000
   3. D-dimers – 500 – 1000 ng/ml
   4. IL-6: 5 - 10 times ULN

e. CT criteria:
   (i) CT Severity Score: 8 – 17

3. **Category C – Severe disease**
   a. Patients features in category A with dyspnoea at rest
   b. Patients with RR > 30/min, SpO2 < 90% on Room Air
   c. CXR showing bilateral diffuse homogenous/heterogenous opacities
   d. Hemodynamic instability.
   e. Presence of altered mentation.
   f. Laboratory criteria: (Any 2 of following criteria)
      1. CRP > 125
      2. Ferritin > 800 mg/dl
      3. D-dimers > 1000 ng/ml
      4. IL-6 > 10 times ULN

e. CT criteria:
   CT Severity Score: ≥ 18

## Management

### Category A

1. Home Isolation
2. Contact and Droplet precautions
3. Strict hand hygiene
4. Pharmacological therapy
    a. Tab Ivermectin 12mg OD x 3days with Tab. Azithromycin 500 OD Day 1 to 3
    b. Tab Doxycycline 100 mg BD Day 4 to 7
    c. Vitamin C 500mg TDS PO
    d. Zinc 50 mg BD PO
    e. Vit D 60,000 IU PO daily for 5 days
5. Plenty of fluids, Pulse oximetry, Temperature monitoring
6. If the patient is persistently febrile and SpO2 < 94% for at least ½ hour measured in two different fingers use of glucocorticoids may be advocated for 3 – 7 days.
7. The molecules of choice are:
    a. Tab. Dexamethasone 6mg OD ***OR***
    b. Tab. Methylprednisolone 32mg OD ***OR***
    c. Tab. Prednisolone 40mg OD
8. If condition doesn't improve in 24 hours nearest COVID hospital should be contacted
9. Patients with risk factors for severe illness (Uncontrolled DM, ESRD, Decompensated CLD) should be monitored closely, given the possible risk of deterioration.
10. If they develop any worsening symptoms (such as mental confusion, difficulty breathing, persistent pain or pressure in the chest, bluish coloration of face/lips, dehydration, decreased urine output, etc.), they should be immediately referred for hospitalization.
11. Children with mild COVID-19 should be monitored for signs and symptoms of clinical deterioration requiring urgent re-evaluation. These include difficulty in breathing/fast or shallow breathing (for infants: grunting, inability to breastfeed), blue lips or face, chest pain or pressure, new confusion, inability to awaken/not interacting when awake, inability to drink or keep down any liquids. If any of the above features are present child should be immediately transferred to ICU.

**Category B**

1. Admit to HDU/ICU, Contact and Droplet precautions, Strict hand hygiene, Maintain adequate hydration.
2. Oxygen Support: Target SpO2: 92-94% (88-92% in patients with COPD)
3. Oxygen supplementation with nasal prongs or face mask. If unable to maintain saturation with up to 6litre/min high flow oxygen delivery systems should be used such as:
   a. Venturi Mask
   b. Non rebreathing reservoir bag masks
   c. High Flow Nasal Cannula
   d. If HFNC or simple nasal cannula is used, N95 mask should be applied over it.
4. Awake proning should be implemented wherever and whenever possible.
5. **Pharmacological management:**
   a. Symptomatic treatment such as antipyretic (Paracetamol) for fever and pain, anti-tussive for cough may be added.
   b. Vitamin C 500mg TDS PO
   c. Zinc 50 mg BD PO
   d. Vit D 60,000 IU PO daily for 5 days
   e. **Anticoagulation**
      a. Prophylactic dose of UFH or LMWH (e.g., enoxaparin 60 mg per day SC) Contraindications: End stage renal disease, active bleeding, emergency surgery
      b. Consider unfractionated heparin in ESRD.
   f. **Corticosteroids**
      g. IV methylprednisolone 0.5 to 1 mg/kg OR Dexamethasone 0.1 to 0.2 mg/kg for 5 – 7 days (preferably within 24 hours of admission)
   **g. Anti-virals**
      a. Inj. Remdesivir 200 mg on Day 1 followed by 100mg daily from Day 2 – 5 (under EUA)
   h. Newer anti-inflammatory therapies like **Baricitinib** may be considered **among patients on Remdesivir** progressive disease to prevent intubation and mechanical ventilation and these therapies **should be individualised and practiced under expert supervision.**
      **Dose:** Tab. Barcitinib 4 mg once daily for 14 days until hospital discharge

i. Consider anti-inflammatory therapy with **anti-IL-6 (Tocilizumab**); if Ferritin or IL-6 doubles within 24 hours along with clinical and physiological signs of deterioration after ruling out clinically significant secondary bacterial or fungal infection

**j. 2-Deoxy D-Glucose (Only under trial settings)**

a. **For moderate to severe disease**

b. Used as an adjunct therapy and to be administered along with primary treatment helps in faster recovery of those who have been hospitalized and also reduces need for supplemental oxygen.

c. Dose -63 mg/kg/day. The drug comes in powder form in sachet, which is taken orally by dissolving it in water.

d. QT interval monitoring required.

k. Empirical therapy with broad spectrum antibiotics according to local antibiotic policy

12. Control of co-morbid condition
13. Follow up CRP, D-dimer & Ferritin every 48-72 hourly (if available); CBC with differential count, Absolute Lymphocyte count, KFT/LFT daily
14. Monitor for:
    a. Increased work of breathing (use of accessary muscles)
    b. Hemodynamic instability
    c. Increase in oxygen requirement.
15. Few patients with COVID-19 experience a secondary bacterial infection. Consider empiric antibiotic therapy as per local antibiogram and guidelines in older people, immune-compromised patients, and children < 5 years of age.
16. Convalescent Plasma may be given in early moderate disease (within 7 days of illness)

**Category C**

1. Cautious trial of CPAP/NIV should be given as the therapeutic window in hypoxemic respiratory failure is exceedingly small. Facility for mechanical ventilation should be ready before attempting NIV.
2. HFNC/NIV has shown to be of benefit in preventing intubation in patients with extremely high oxygen requirements.
3. Use conservative fluid management in patients with Severe COVID when there is no evidence of shock.
4. **Anti-virals**
   a. Inj. Remdesivir 200 mg on Day 1 followed by 100mg daily from Day 2 – 5 (under EUA)
5. **Corticosteroids and anti-inflammatory therapy**
   i. **IV methylprednisolone 1 to 2 mg/kg OR Dexamethasone 0.2 to 0.4 mg/kg for 7 – 10 days** (Dose may be tapered according to radiological involvement and clinical recovery).
   ii. **Consider anti-inflammatory therapy** with ***anti-IL-6 OR Methylprednisolone pulse (250mg for 3days) or JAK 1/2 inhibitor therapy,*** if Ferritin or IL-6 doubles within 24 hours along with clinical and physiological signs of deterioration after ruling out clinically significant secondary bacterial or fungal infection.
   iii. Newer anti-inflammatory therapies like **Baricitinib** may be considered **among patients on Remdesivir** progressive disease to prevent intubation and mechanical ventilation and these therapies **should be individualised and practiced under expert supervision.**

   **Dose:** Tab. Barcitinib 4 mg once daily for 14 days until hospital discharge
   Consider anti-inflammatory therapy with **anti-IL-6 (Tocilizumab**); if Ferritin or IL-6 doubles within 24 hours along with clinical and physiological signs of deterioration after ruling out clinically significant secondary bacterial or fungal infection
   iv. **2-Deoxy D-Glucose (Only under trial settings)**
   a. **For moderate to severe disease**
   b. Used as an adjunct therapy and to be administered along with primary treatment helps in faster recovery of those who have been hospitalized and also reduces need for supplemental oxygen.

c. Dose -63 mg/kg/day. The drug comes in powder form in sachet, which is taken orally by dissolving it in water.
d. QT interval monitoring required.

6. **IVIG**
   i. **For severe disease as a rescue therapy**
   ii. Immunomodulatory effect to suppress a hyperactive immune response i.e cytokine storm syndrome which ends up being the major cause of lung injury.
   iii. Dose: 0.5 g/kg daily for 3 days.
   iv. Early administration of IVIG (within 3 days of admission) is correlated with a significantly shorter length of hospital stay reduced ventilator use, reduced hospital and intensive care unit length of stay, and improved 28- day mortality.

7. **Anticoagulation**
   a. Therapeutic dose of UFH or LMWH (e.g., enoxaparin 60 mg twice a day SC) Contraindications: End stage renal disease, active bleeding, emergency surgery
   b. Consider unfractionated heparin in ESRD.

8. Empirical therapy with broad spectrum antibiotics according to local antibiotic policy
9. Control of co-morbid condition
10. Inj. Thiamine 100 mg IV OD, Inj. Vit C 1.5gm IV 6 hourly in patients on mechanical ventilation and/or shock
11. Mechanical ventilation if unable to maintain saturation, increased work of breathing or development of hemodynamic instability.
    a. Conventional ARDS Net strategy
    b. Proning, recruitment manoeuvres