Clinical Management of COVID-19

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Clinical Features, Suspects and Triage

Clinical Features

- **Fever (87.9%)**
- **Dry cough (67.7%)**
- **Fatigue (38.1%)**
- Sputum production (33.4%)
- **Shortness of breath (18.6%)**
- Sore throat (13.9%)
- Headache (13.6%)
- **Myalgia or arthralgia (14.8%)**
- Chills (11.4%)
- Nausea or vomiting (5.0%)
- **Nasal congestion (4.8%), change in smell/ taste sensation**
- Diarrhea (3.7%)
- Hemoptysis (0.9%)
- Conjunctival congestion (0.8%)
- ARDS (3%)

When to suspect for COVID-19

- **Symptoms** (within 14 days after travel from COVID affected area) like-
  - Fever
  - Cough
  - Shortness of breath
- **Close contact** with symptomatic person (who travelled to COVID affected area)
- Symptomatic **health care worker/ caretakers**
- **Severe form of unusual illness** (not explained by other diagnosis)
- Cluster of patients

Triage

- ARI with –
  - Temp **>=38º C(100.4 F)**
  - Cough
  - Onset within last 10 days
  - Requiring Hospitalization
- Illness not explained by other diagnosis
- Absence of fever do not exclude viral infection

Triage is the process of early recognition of patients with SARI, associated with nCoV infection

Case Classification & Patient Monitoring

Suspect Case

- **ARI** with
  - Fever
  - Cough
  - Requiring hospitalization
- Illness **not explained by other diagnosis**
- **At least one of the criteria** discussed

Probable Case

- **COVID-19 test result inconclusive**
- Tested positive on pan-coronavirus assay- **presumptive positive**

Confirmed Case

- **Lab confirmed COVID-19 infection** (Irrespective of symptoms)

What to monitor when patients comes?

1. **Heart Rate**
2. **Blood Pressure**
3. **Oxygen Saturation**
4. **Respiration**
5. **Temperature**

Clinical Syndromes associated with COVID Infection

Symptoms	Uncomplicated Illness	Mild Pneumonia	Severe Pneumonia
Respiratory tract infection	Yes	Yes	Yes
Fever	May or may not	Yes	Yes
Cough	May or may not	Yes	Yes
Shortness of breathe	No	Yes	Yes
Fast breathing	No	**Children** <2 months ≥60 breaths/min 2-11 months ≥50 breaths/min 1-5 years ≥40 breaths/min	**Adolescent or adults** Respiratory rate **> 30 breaths/min** **SpO2 <90% on room air** **Children** Cough or difficulty in breathing +central cyanosis or **SpO2 *<90%***
Nasal congestion	May or may not	May or may not	May or may not
Headache	May or may not	May or may not	May or may not
Muscle pain	May or may not	May or may not	May or may not
Malaise	May or may not	May or may not	May or may not
Dehydration	No	No	May or may not
Sepsis	No	No	May or may not
Pneumonia	No	Mild	Yes
Signs of severe Pneumonia	No	No	Yes
In Children			
Severe respiratory distress	No	No	Yes
Inability to breastfeed/ drink	No	No	Yes
Lethargy	No	No	Yes
Unconsciousness	No	No	Yes

Assessment of Severity of Pneumonia

CURB 65 Criteria	
Confusion	Altered mental status
Blood urea	7 mmol/l (42 mg/dl)
Respiratory Rate	**> 30 breaths/min**
SBP, DBP	**< 90 mmHg, <60 mmHg**
Age	> 65

Indications for Admissions

Hospital Admission

COVID Care Center (CCC)

Cases with

- Suspected cases of COVID19 awaiting results
- COVID positive
  - Pre-symptomatic
  - Very Mild Symptoms
  - Mild Symptoms

Dedicated Covid Health Center (DCHC)

- Respiratory rate **15-30 breaths/min**
- **SpO2 90- 94%** in room air
- **High risk patients**
  - Age > 60 years
  - Cardiovascular diseases including hypertension
  - Diabetes mellitus/other immunocompromised states
  - Chronic lung/liver/kidney disease
  - Cerebrovascular disease

Dedicated Covid Hospital (DCH)

- Respiratory rate **>30 breaths/min**
- **SpO2 < 90%** in room air
- Moderate/ Severe ARDS
- Multi-organ dysfunction
- Shock
- Transfer from ward to ICU if needs mechanical ventilation/closer monitoring

Suspect and confirmed cases should not be allowed to mix under any circumstances

Investigations to be Sent

Blood Cell Count

- WBC count can vary – do not provide accurate information
- Leukopenia
- Leukocytosis
- Lymphopenia (seen in more than 80% patients)
- Mild thrombocytopenia- poor prognostic sign

Other Investigations

- Serum LDH, Ferritin, CRP and HbA1c levels
- LFT
- RFT
- Serum electrolytes
- ECG
- CPK MB, TROP I
- D- dimer, coagulation parameters
- ABG, S Lactate
- Procalcitonin
- Abnormalities on chest X-ray (59%)
- Radiological findings on chest CT scan (86%)

Other biochemical & pathological investigations to be sent as required for critical patients

Radiology

Computed Tomography (CT Chest)

Tomographic changes of 21 patients with mild to moderate disease who recovered from the disease were studied, and they described **four stages** (Pan et al)

Chest Radiography (CXR)

- Findings not specific
- Initial phase of disease could be normal
- Most common features
  - Lobar/Multi lobar
  - Bilateral lung consolidation

1 **Early Stage**

- **0-4 days after onset of symptoms**
- Frequent ground glass opacities (GGO)
- Sub-pleural distribution (involving predominantly lower lobes)
- CT could be normal

2 **Progressive Stage**

- **5-8 days after onset of symptoms**
- Multi- lobe distribution with GGO
- Rapid involvement of both lungs
- Crazy paving
- Consolidation of airspaces

3 **Peak Stage**

- **9-13 days after onset of symptoms**
- Denser consolidation, present in almost all the cases
- Residual parenchymal bands

4 **Absorption Stage**

- **> 14 days after onset of symptoms**
- No crazy craving pattern
- GGO could remain

Clinical Conditions

Acute Respiratory Distress Syndrome

- **Bilateral opacities** (not fully explained by)
  - Lobar
  - Lung collapse
  - Nodules
- Origin of **oedema**
- **Respiratory failure** (not fully explained by)
  - Cardiac failure
  - Fluid overload
- **Need of Echocardiography/ Pro BNP** (to exclude hydrostatic cause of oedema if no risk factor present)

Sepsis

- Life threatening **organ dysfunction**
- Laboratory evidence of –
  - Coagulopathy
  - Thrombocytopenia
  - Acidosis
  - High lactate
  - Hyperbilirubinemia

Septic Shock

- **Persisting hypotension despite volume resuscitation**
- Requiring Vasopressors to maintain
  - MAP ≥65 mmHg
  - Serum lactate level >2 mmol/L

Dedicated COVID Health Centre (DCHC)

Case Type	• All Cases that have been clinically assigned as moderate
Facility Type	• Full Hospital or a Separate Block in an Hospital (Separate entry, exit) • Private Hospital (Could be)
Admission Protocols	• Separate areas for suspected and confirmed cases • No intermixing of patients allowed by any means

Facility Mapping for referrals	• To be mapped to at least or more DCH
Stakeholders	• Medical Officer, Staff Nurse, Ward Boy, Guard, Sweeper, Senior Resident • PMGO, Medicine, Anaesthetist, Pulmonologist, Ventilator Technician
Essentials	• Dedicated Basic Life Support Ambulance (BLSA) equipped with sufficient oxygen support on 24x7 basis • Beds with Assured Oxygen support

Clinical Management

1. Immediate implementation of appropriate IPC measures
2. Early supportive therapy and monitoring
3. Management of hypoxemic respiratory failure and ARDS
4. Prevention of complication

IPC Measures and Early Supporting Therapy and Monitoring

IPC Measures

AT Triage

- Give patient a **medical mask**
- Direct patient to separate area, an isolation room if available

Droplet Precaution

- **Hand hygiene** after contact with respiratory secretion

Contact Precaution

- **Use PPE** when entering room and remove PPE when leaving.

Early Supportive Therapy & Monitoring

1. Give supplemental oxygen therapy

- Initiate oxygen therapy at 2- 5L/min
- Titrate flow rates
  - SpO2 ≥90-92% in non-pregnant adults
  - SpO2 ≥92-95% in pregnant women
- High-flow nasal oxygen (HFNO) or non-invasive ventilation(NIV)to be used in patients with hypoxemic respiratory failure
- Implement mechanical ventilation
  - **4–8ml/kg predicted body weight, PBW**
  - Plateau pressure<30cmH2O)
- Hypercapnia is permitted if pH - 7.30-7.45
- Prone ventilation for >12 hours per day in patients with severe ARDS

2. Use conservative fluid management. **IV Line** and inotropes

3. Empiric antimicrobials to treat all likely pathogens causing SARI

4. Systemic corticosteroids

Glucocorticoids, Specific Therapy and Prevention of Complication

Need for glucocorticoids

- For patients with-
  - **Progressive deterioration of** oxygenation indicators
  - Rapid **worsening on imaging**
  - Excessive **activation of the body's inflammatory response**
- Duration- **3 to 5 days** (short period)
- Dosage- **1 – 2mg/kg/day** (should not exceed the equivalent of methylprednisolone)
- Larger dose will delay the removal of coronavirus due to immunosuppressive effects

Specific Therapy

- No specific Antiviral
- For severe patients in ICU-
  - **Hydroxychloroquine (**Dose 400mg BD – for 1 day followed by 200mg BD for 4 days)
  - With/without-combination with Azithromycin (500 mg OD for 5 days)
  - Regular monitoring for side effects including QTc interval
- Above medication not recommended for children < 12 years, pregnant and lactating women
- **Consider Tocilizumab/Therapeutic plasma exchange when there is progressive worsening**

Prevention of Complication

- Reduce incidence of
  - Catheter related **blood stream infection**
  - **Pressure ulcers** -turn patient every two hourly
  - **Stress ulcers and gastrointestinal bleeding -** early enteral nutrition, PPI
  - **ICU-related weakness Early mobilization**
  - **Ventilator associated pneumonia-** Oral intubation, semi recumbent position , closed suctioning system, new ventilator circuit for each patient
  - Venous thromboembolism **LMWH**
- Reduce days of invasive mechanical ventilation **weaning protocol**, intermittent sedatives

Management of Septic Shock

1. Recognize septic shock in adults in case of infection

- **Vasopressors are needed** to maintain
- Mean arterial pressure (MAP) ≥65 mmHg
- Lactate is >2 mmol/L, in absence of hypovolemia

2. Recognize septic shock **in children** with any **hypotension**

- Systolic blood pressure [SBP] <5th centile or >2 SD below normal for age
- 2-3 of the following conditions -
  - Altered mental state
  - Tachycardia or bradycardia (HR <90 bpm or >160 bpm in infants and HR <70 bpm or >150 bpm in children);
  - **Prolonged capillary refill** (>2 sec)
  - **Warm vasodilation with bounding pulses**
  - **Tachypnea/ mottled skin** or petechial or purpuric rash
  - Increased lactate/oliguria;
  - Hyperthermia or hypothermia

- Standard care includes-
  - **Antimicrobial therapy and fluid loading**
  - **Vasopressors** for hypotension

- **In adults-**
  - at least **30 ml/kg of isotonic crystalloid** in the **first 3 hours**
- **In children**
  - 20 ml/kg as a rapid bolus and up to 40-60 ml/kg in the first 1 hour

- Do not use hypotonic crystalloids, starches, or gelatins for resuscitation

- **Discontinue fluid administration if there is no response to fluid** loading and signs of volume overload appear (example- **jugular venous distension, crackles on lung auscultation, pulmonary oedema on imaging, or hepatomegaly in children)**

Management of Septic Shock & Daily Follow Up

Management of Septic Shock

- Perfusion targets include
  - **MAP** (>65 mmHg or age- appropriate targets in children)
  - **Urine output -Adults-**>0.5 ml/kg/hour; **Children-** 1 ml/kg/hour
  - **Improvement of skin mottling, capillary refill, level of consciousness, and lactate level**
- Administer vasopressors when shock persists during or after fluid resuscitation
- If signs of **poor perfusion and cardiac dysfunction persist** despite achieving MAP target with fluids and vasopressors, consider an inotrope such as **dobutamine**

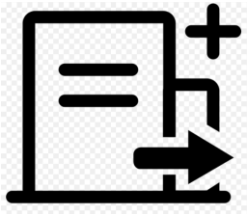
Daily Follow-Up

- Monitor Vitals , SpO2
- Auscultate from back only with due precaution
- CBC, Blood Sugar, RFT Electrolytes
- CXR
- ABG
- Inflammatory markers

Discharge Protocol

Discharge Policy

- **For cases awaiting nCOV test results** –
  - To be kept in home isolation/ isolation at health facility till receipt of lab results and given symptomatic treatment as per existing guidelines
- **For negative nCOV test**
  - Provisional/confirmed diagnosis and
  - Decision of treating physician
  - Case shall still be monitored for 14 days after their last contact with a confirmed 2019-nCoV case
- **For Positive nCOV test**
  - Stable (asymptomatic/ mild/moderate) cases will be discharged at 10th day (with next 7 days isolation) and no further testing, alternatively home isolation can be followed
  - Severe case to be discharged after evidence of clinical recovery- chest radiographic clearance and viral clearance in respiratory samples after one specimens test negative for nCOV

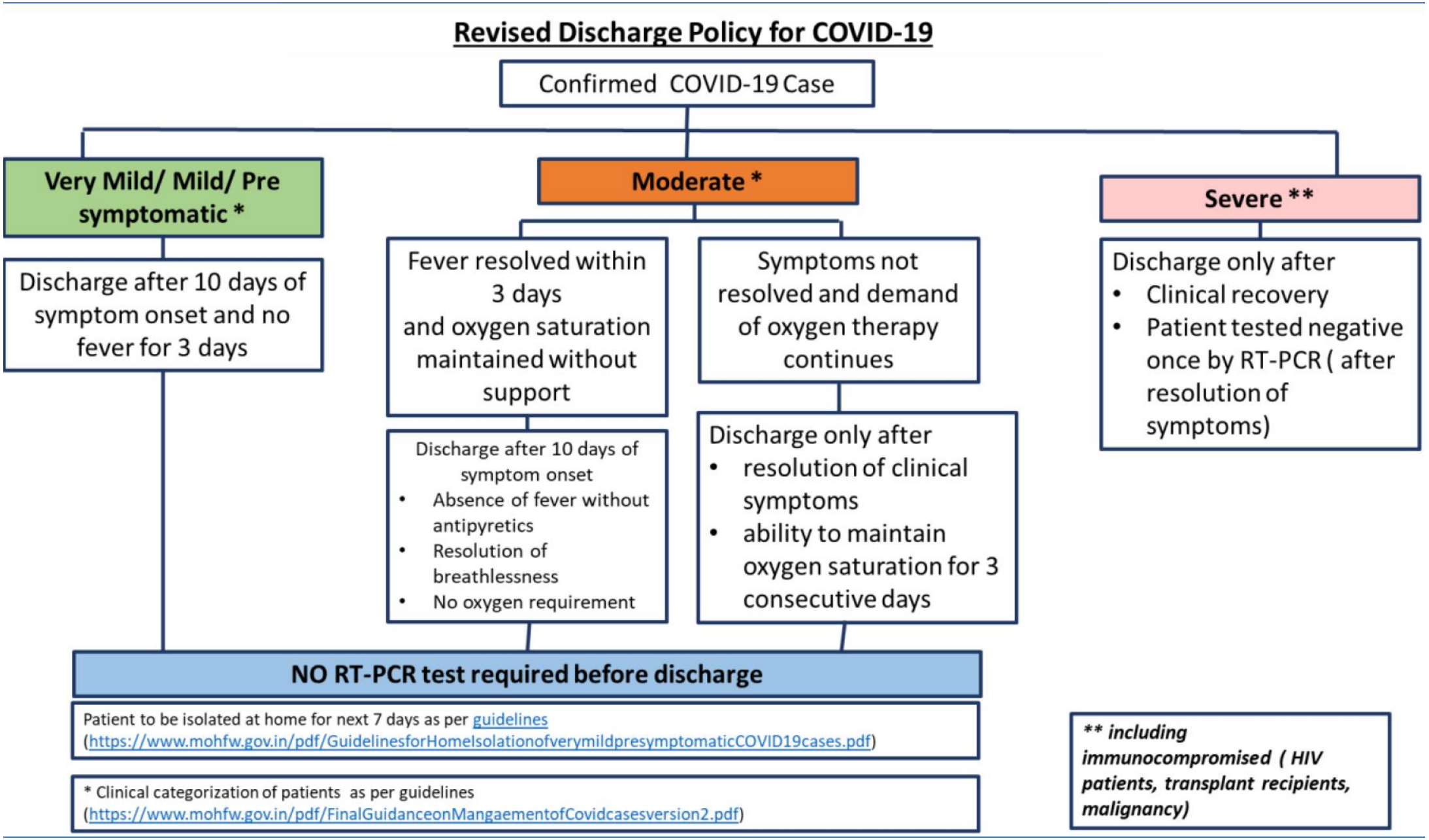


Plan for Discharge

- Chest x ray PA view
- Clinically stable

- **Instructions-**
- Rest in isolation, review if symptoms
- Nutritious diet
- Plenty of liquids
- Watch for symptoms- own/ family/ contacts.

Revised Discharge Policy



Thank You!