CHILD WITH COVID SYMPTOMS

DISEASE SPECTRUM OF SARS-CoV-2 INFECTION IN CHILDREN:

✔ Children with suspected COVID-19 to be kept together with caregivers where possible. Check for COVID-19 (confirmatory test: RT-PCR/CBNAAT; positive RAT is acceptable; if negative confirm with RT-PCR).

✔ Confirm COVID-19 before determining severity.

✔ Some children may present with symptoms of acute abdomen or other GI symptoms or rarely CNS symptoms.

ASYMPTOMATIC
Child detected Positive in RT-PCR/CB-NAAT RAT but without any symptoms. Parents to be briefed on monitoring for any development of symptoms and likelihood of post COVID illness. No investigations needed.

MILD
1. Fever AND/OR
2. Sore throat, rhinorrhea, cough or nasal blockage AND
3. No fast breathing
4. SpO2 ≥ 94%
5. No danger signs
No investigations needed.

MODERATE
1. Fast breathing (age based):
   • ≥60/min for <2 months,
   • ≥ 50/min for 2-11 months,
   • ≥ 40/min for 1-5 years,
   • ≥ 30/min for >5years.
   OR
2. SpO2 90-94% on Room air AND
3. No Signs of severe disease
No lab tests required routinely unless indicated by associated comorbid condition.
CBC and CRP may be done. Repeat CBC and CRP after 48 hours if indicated.

SEVERE
1. Child with any of these:
   • Central Cyanosis
   • SpO2< 90%
   • Increased respiratory efforts (grunting, severe retraction, or chest indrawing)
   • Lethargy and somnolence
   • Shock
   • Altered consciousness.
   • Multi Organ Dysfunction Syndrome (MODS)
CBC, LFT, RFT, CRP, ABG, Blood culture and Chest X-ray. Repeat after 48 hours, if clinically indicated.

For cardiac involvement:
ECG, Echocardiography, cardiac biomarkers- Cardiac troponin, CPK-MB, proBNP
Coagulation markers: D-dimer, PT and aPTT, Fibrinogen
## Clinical Management Protocol for Child with COVID-19

### MILD

**Home Isolation / COVID Care Centre**

- **Supportive care:** Rest, adequate hydration and feeding, ORS, monitor vitals.
- **Symptomatic care:** Paracetamol 10-15 mg/kg/dose for fever (minimum 4 hours gap between two doses).
  - Use MDI and spacer if any inhaled medications indicated. Avoid nebulization.

**Parents to report if worsening of symptoms:**
- Persistent fever for ≥ 5 days, recurrence of fever, reduction in oral intake, dehydration or decreased urine output, lethargy, shortness of breath OR SpO2<94%.

**If home monitoring/isolation not possible, admit children with mild illness particularly those with comorbidities such as chronic lung disease, symptomatic heart disease, chronic kidney disease, neurological disorder, malignancies on chemotherapy, diabetes, morbid obesity, immunodeficiency, or on immunosuppressants due to pre-existing conditions etc.**

### MODERATE

**Admit in Dedicated COVID Facility**

- **Supportive care:** Adequate hydration and feeding (may need nasogastric feeding), ORS (avoid dehydration and overhydration), monitor vitals.
- **Symptomatic care:** Paracetamol 10-15 mg/kg/dose for fever (minimum 4 hours gap between two doses).
  - Children who have wheezing use Salbutamol ± Ipratropium MDI +Spacer
  - Avoid Nebulisation

**Supportive/Specific Therapy**

- **Oral antibiotics**— only if suspicion of concomitant bacterial infection.
- **If SpO2<94%**, start supplemental oxygen therapy through nasal prongs or face mask.
- **Consider steroids:** if there is very rapid progression and when other causes of fever are ruled out, OR if saturation is below 94% on supplemental oxygen therapy beyond 5 days of illness, OR fever persisting beyond 7 days with high inflammatory markers.

**Watch for progression to severe disease.**

### SEVERE (including critical)

**Admit in COVID HDU/ PICU**

- **Supportive care:** Maintain adequate hydration (avoid overhydration). Start early enteral feeding. Monitor vitals.

**Symptomatic Care**

- **Paracetamol** 10-15 mg/kg/dose through NG tube or IV for fever;
- **Supportive/Specific Therapy**
  - **Empiric antimicrobials**— only if suspicion of concomitant bacterial infection.
  - **Oxygen therapy:**
    - Start with NRBM (10 L/min); if no response, step-up to HFNC with a flow of 0.5 to 2 L/kg/min and FiO2 of 40%-100% to target SpO2 92 to 96% and then titrate according to response.
    - (Increase flow by 0.5 L/kg above 12 kg). If no response – step up to NIV. 
    - **SpO2 target > 94% during resuscitation** (once stable, target SpO2> 90%).
    - **Awake proning** in children >8 years.

**Steroids:**

- **Dexamethasone** 0.15 mg/kg per dose (max. 6 mg) for 1-2 times a day, 5 days (duration may be extended up to 10 days depending on clinical response) is preferred.
  - [Alternatively, Prednisone (1–2 mg/kg/day per dose, maximum dose 60 mg) or Methylprednisolone (1–2 mg/kg/day IV, maximum dose 60 mg) can be used.]
  - **Evaluate for thrombosis, HLH, organ failure.**

**ARDS:** Conservative fluid management strategy, sedation. **Oxygen therapy/respiratory support:**

1. **Mild ARDS:**
   - HFNC/NIV initially
2. **Severe ARDS:**
   - Mechanical ventilation: Low tidal volume (6 ml/kg), high PEEP, cuffed endotracheal tube. Prone if feasible. If poor response, consider HFOV, ECMO.

**Shock/ Myocardial dysfunction**

1. Crystalloid bolus 10-20 ml/kg over 30-60 min; to be administered fast if child is hypotensive, while monitoring closely. Avoid/administer carefully if myocardial dysfunction suspected.
3. Early inotrope support—epinephrine first-line treatment
**Diagnostic Criteria for MIS-C [WHO]:**
Children and adolescents 0–19 years of age with fever ≥ 3 days AND two of these:
- Rash or bilateral non-purulent conjunctivitis or mucocutaneous inflammation signs (oral, hands or feet).
- Hypotension or shock.
- Features of myocardial dysfunction, pericarditis, valvulitis, or coronary abnormalities (including ECHO findings or elevated Troponin/NT-pro BNP).
- Evidence of coagulopathy (elevated PT, PTT, elevated d-Dimers).
- Acute gastrointestinal problems (diarrhoea, vomiting, or abdominal pain).

**AND**
- Elevated markers of inflammation such as ESR, C-reactive protein, or procalcitonin.
- No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes.
- Evidence of COVID-19 (RT-PCR, antigen test or serology positive), or likely contact with patients with COVID-19.

**MILD (Non-life threatening) MIS-C**
Fever and stable vital signs. Absence of shock or organ threatening disease.

- **IV Methylprednisolone** (1-2 mg/kg day) for 3 days followed by course of oral steroids tapered over 2–3-week.

- For thromboprophylaxis **Aspirin 3 - 5 mg/kg/day; max 75 mg/day (contraindication- platelets <80,000/µL or active bleeding)**

If no improvement or worsening of symptoms
Consult IVIG after ruling out alternative diagnoses.

**SEVERE MIS-C/ Myocardial/ coronary involvement**
Shock, respiratory distress, MOD, cardiac manifestations (myocardial dysfunction/ coronary abnormalities).

- **IVIG + IVMP**
  - IVMP: (Methylprednisolone 1-2 mg/kg/d) and
  - IVIG (2 g/kg within 12-24 hrs; Slower administration may be needed in patients with cardiac failure/ fluid overload)

- Antimicrobials: based on clinical judgement and microbiological data if child presents with shock.

If no improvement or worsening of symptoms,
- Consider **High dose steroids (Methylprednisolone 10-30 mg/kg/day for 3-5 days, max 1 g / day)**.
- If unresponsive to above, may consider high dose **Infliximab** for < 5 years with Kawasaki like illness.
- Consult an expert for further therapy e.g.: Anakinra
- **Taper steroids over 2-3 weeks while monitoring inflammatory markers (CRP).**

**Early vasoactive medication** in children with shock/ myocardial dysfunction.

- **Cautious fluid resuscitation**
- **Antiplatelet and anticoagulation therapy (in patients without active bleeding or significant bleeding risk):**
  - **Aspirin 3 - 5 mg/kg/day; max 75 mg/day (Indications: KD like features; coronary artery Z score>=2.5; thrombocytosis; contraindication- platelets <80,000/µL)**
  - **Enoxaparin (indications: Coronary aneurysm (Z-score > 10) or Thrombosis or LVEF < 35%) Dosage: 1 mg/kg twice daily SC.**