CHILD WITH COVID SYMPTOMS

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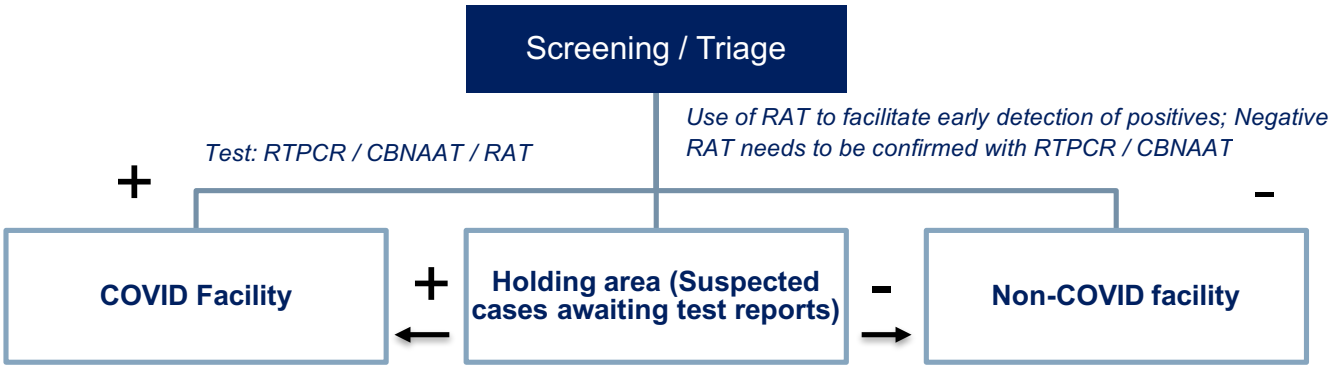

DISEASE SPECTRUM OF SARS-CoV-2 INFECTION IN CHILDREN:

- ✔ *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.*

	SYMPTOMS	INVESTIGATIONS
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	MODERATE	SEVERE *(including critical)*
HOME ISOLATION / COVID CARE CENTRE	**ADMIT IN DEDICATED COVID FACILITY**	**ADMIT IN COVID HDU/ PICU**
Supportive care: Rest, adequate hydration and feeding, ORS, monitor vitals.	**Supportive care**: Adequate hydration and feeding (may need nasogastric feeding), ORS (avoid dehydration and overhydration), monitor vitals.	**Supportive care**: Maintain adequate hydration (avoid overhydration). Start early enteral feeding. 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.	**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.**	**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.**
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 co-morbidities 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.		**Elective intubation** if GCS persistently below 8/ refractory shock **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. 2. Monitor for fluid overload. 3. Early inotrope support- epinephrine first-line treatment

CHILD WITH MIS-C

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 muco-cutaneous 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.

AND

- ✓ No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes.

AND

- ✓ Evidence of COVID-19 (RT-PCR, antigen test or serology positive), or likely contact with patients with COVID-19.

Tiered investigations to be adopted:

Child with non-critical symptoms: Level 1 and work up for tropical infections→ add Level 2 tests if high clinical suspicion for MIS-C → If, MIS-C not confirmed, managed as per usual protocol and re-evaluate after 1-2 days if symptoms persist.

Child with critical symptoms: stabilize → Level 1 and 2 tests and work up for tropical infections.

Common tropical infections include: Malaria, Dengue, Enteric fever, Rickettsial illness (scrub typhus), etc.

Investigations:

Level 1: SARS-CoV-2 PCR and serology and both of the following should be present:

(1) **CRP> 5 mg/L and/or ESR > 40 mm in the first hour.**

(2) **At least one of these:**

- ALC < 1000/µL,
- Platelet < 150,000/µL,
- Na < 135 mEq/L,
- Neutrophilia (ANC>7700/µL),
- Hypoalbuminemia (<3 g/dL)

Level 2: Cardiac (ECG, Echocardiogram, proBNP (>400 pg/mL), elevated Troponin T); **Inflammatory markers** (Procalcitonin, Ferritin (>500 ng/ml), prolonged PT or PTT, D-dimer (>0.55 mg/L), Fibrinogen(>400 mg/dL), high LDH, Triglyceride, Cytokine panel); Blood Smear.

MILD (Non-life threatening) MIS-C

Fever and stable vital signs. Absence of shock or organ threatening disease.

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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)*

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If no improvement or worsening of symptoms

Consider IVIG after ruling out alternative diagnoses.

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SEVERE MIS-C/ Myocardial/ coronary involvement

Shock, respiratory distress, MOD, cardiac manifestations (myocardial dysfunction/ coronary abnormalities).

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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.

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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).**

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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.*