Clinical Guideline

Health
Hunter New England
Local Health District

Inpatient Clinical Management of COVID-19 in Paediatrics

Due to the continuously emerging situation, this Clinical Guideline will be regularly updated

This clinical guideline applies to:	Hospitalised patients with **suspected or confirmed diagnosis of COVID-19**
Sites where clinical guideline applies:	All acute facilities
Exclusions:	Neonatal Intensive Care Units and Special Care Units. For NICU/SCUs see separate clinical guideline
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FURTHER RESOURCES:

- Infection Prevention and Control
- HNE COVID-19 IPC page
- Federal CDNA Public Health guidelines
- NSW Guidance on Laboratory Testing for SARS-CoV-2
- Latest COVID-19 case location sand alerts in NSW
- Australian Society of Anaesthetists - Principles of Airway management in COVID-19
- National living COVID-19 evidence-based guidelines

1. Current National Testing Criteria ('suspect case')

Note enhanced testing criteria (beyond the suspect case definition) continue to be recommended, as below:

- Anyone with unexplained fever (temperature ≥ 37.5 degrees)/history of fever **OR** acute respiratory symptoms (e.g. cough, sore throat) **OR** acute loss of smell or taste should be offered testing.
- Note a patient with a likely alternative explanation for fever does not need to be tested unless there is a strong epidemiological reason (as per CDNA criteria – e.g. close contact with a confirmed or suspected case, people who have been in areas with recent local transmission).
- Asymptomatic people should NOT be tested unless it is part of an outbreak investigation under the direction of Population Health or they have been in a nominated exposure site.
- Current advice re. specimen collection is set out in the following link which is regularly updated: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

- For advice about the current local approach to respiratory virus testing and the availability/indications for rapid SARS-CoV-2 tests, refer to Limited respiratory virus PCR multiplex and Rapid testing Brief. Rapid testing capacity is now available at JHH, Taree, Tamworth, and Armidale laboratories.
- Testing of a paediatric patient swabbed for COVID-19 **MUST NOT** interfere with the usual assessment and management of presenting clinical issue.

2. Assessment for Hospital Admission

- Where possible patients with a suspected or confirmed COVID-19 diagnosis should be managed in the home environment under strict home isolation with monitoring by the Public Health Unit.
- If patient suitable for care at home, discuss with Public Health Unit (via switchboard) to ensure appropriate disease control measures are in place.
- It is important to be aware that most paediatric patients presenting with respiratory illnesses will not be unwell due to COVID-19 (although they may have both another respiratory illness AND COVID-19). Routine care for these patients must not be compromised due to a question as to COVID-19 status. However, it is critical that appropriate PPE is used during the provision of care for these common paediatric respiratory illnesses whilst COVID-19 status remains to be determined.
- Consider admission if clinically indicated as per usual paediatric practice.
- Discuss all suspected or confirmed COVID-19 cases with the relevant paediatric consultant on-call prior to admission.
    - For John Hunter Children's Hospital (JHCH) - It is the responsibility of the relevant paediatric consultant on-call to discuss the patient with the J2 ward (COVID-19) consultant (if activated). It is requested that the AMO/JHCH COVID-19 Consultant notify the JHH COVID-19 Consultant of any CONFIRMED cases for admission.

3. Patient Placement and Infection Control

- Manage all patients with proven COVID-19 under standard, **contact, droplet and airborne precautions** (P2/N95 respirator, eye protection, fluid resistant gown or apron, gloves) in a locally designated COVID-19 area that has controlled negative air flow. Cohorting should only occur within a controlled ward (pod) that has isolated ventilation and a negative airflow entry.
- Manage high risk potential cases (awaiting test result) under standard, contact, droplet and airborne precautions in a designated separate ventilated area to confirmed cases.
- Only one parent/caregiver is to be allowed to stay with a patient and the parent must not leave the ward until the patient is discharged. No additional visitors are permitted. Parents / caregivers who themselves have COVID-19 symptoms are NOT to attend the hospital (unless there has been prior approval by the Hospital Incident Controller). If a COVID-19 positive patient is to be transferred to other locations in the hospital (including Operating Theatres and Medical Imaging), then the parent/carer is NOT to accompany the patient and is to stay in the patient's room.
- Avoid aerosol-generating procedures if at all possible. Aerosol-generating procedures include nebulised medications, non-invasive ventilation, bronchoscopy, spirometry and various airway management procedures including tracheal intubation.
- All inpatients who have been tested for Sars-CoV-2 PCR are to be alerted to the Infection Prevention Service (IPS) by annotation on the EPJB and/or email/phone
    - Suspected COVID-19 transmission based precautions are to commence upon testing
    - IPS will add the relevant alerts to iPM and advise of changes in transmission based precautions on finalisation of pathology
- If initial SARS-CoV-2 PCR returns negative, proceed according to the pre-test probability:

- Low to moderate pre-test probability (e.g. patient didn't meet testing criteria, firm alternate diagnosis, clinical or epidemiological issues not suggestive) – discuss with COVID-19 consultant on-call if unsure
  - Remove from isolation
  - Continue to manage as clinically indicated
- High pre-test probability (as determined by paediatric consultant in discussion with COVID-19 consultant on call)
  - Continue isolation
  - Repeat SARS-CoV-2 PCR as soon as possible

4. Diagnostic work up

- Assess all patients as clinically indicated and consider all likely diagnoses including co-infection.
- If critically unwell, include rapid flu PCR and respiratory virus testing. Take baseline serum for storage in case paired SARS-CoV-2 serology needed later. Refer to Limited respiratory virus PCR multiplex and Rapid testing Brief 24Jun21.

5. Monitoring of suspected or confirmed COVID-19

- In patients who are deteriorating, monitor CRP, FBC, EUC, LFTs, troponin I, procalcitonin, ferritin, coags including D-dimer and LDH every 1 - 3 days.
- Perform baseline 12-lead ECG as clinically indicated.
- Consider possibility of secondary bacterial infection and treat as per sepsis pathway if indicated.
- Repeat CXR only if clinically indicated (e.g. if patient is deteriorating or has been recently intubated).
- There is no need for routine CT scanning, only CT scan if clinically indicated.
- If patient is critically unwell, perform bedside echocardiography (where available) in consultation with JHH PICU consultant.
- For release from isolation criteria see section 11 below.

6. General management

- Give supplemental low flow oxygen as clinically indicated to maintain SpO_2 > 92%
  - If hypoxic on low flow oxygen, High Flow Nasal Prongs (HFNP) may be initiated **ONLY** by paediatric, PICU or ED consultant
  - If HFNP is commenced:
    - **Airborne infection control precautions** are required
    - Place patient in single room (preferably with negative air flow) and keep door closed
- Avoid use of nebulisers – use metered dose inhalers with spacers where possible.
  - Adrenaline nebulisers should be reserved for patients with severe croup,
  - If a nebuliser must be utilised:
    - **Airborne infection control precautions** are required
    - Place patient in single room (preferably with negative air flow) and keep door closed
    - PPE to be worn for 30 minutes post nebuliser administration
    - Ensure smoke detectors have been isolated through engineering for duration of nebuliser
- If hypotensive, administer 10–20 mL/kg fluid boluses. Consider vasopressor therapy if patient remains hypotensive after 2-3 boluses, in consultation with senior clinician e.g. ED, PICU or retrieval consultant.
- Consider appropriate management utilising sepsis pathway or febrile neutropenia pathway if indicated.
- If awaiting influenza PCR result AND chronic comorbidities or critically ill
  - Consider treating with oseltamivir

  - Cease if influenza PCR returns negative

- Consider venous thromboembolism (VTE) prophylaxis as per standard protocol for paediatric patients over the age of 16 years.

7. Adjunctive and antiviral drugs

- Consider dexamethasone for hospitalised children with COVID-19 who require high flow oxygen, non-invasive ventilation (NIV) or invasive mechanical ventilation
  - Dose: 0.15 mg/kg/day to a maximum of 6 mg/day PO (or same dose IV if patient is unconscious or not tolerating oral intake) for 10 days or until hospital discharge, whichever occurs earlier.
  - If dexamethasone is not available, an acceptable alternative is either:
    - Hydrocortisone - intravenous or intramuscular 1 mg/kg/dose, every 6 hours for up to 10 days (to a maximum dose of 50 mg every 6 hours), OR
    - Methylprednisolone - appropriate dosage is uncertain
- In other circumstances, avoid corticosteroids unless there is an evidence-based indication for them e.g. severe acute exacerbation of asthma
- The recommendations in relation to remdesivir are evolving. Remdesivir is currently recommended for hospitalised paediatric patients:
  - Aged ≥ 12 years with increasing oxygen requirements AND risk factors for severe disease
  - Aged ≥ 16 years with increasing oxygen requirements
- Use of remdesivir must involve consultation with infectious disease physicians, paediatric immunologists and other relevant expert clinicians.
- Use of antivirals or immunomodulatory agents may be considered in consultation with infectious disease physicians, paediatric immunologists and other relevant expert clinicians. This may need review with changing clinical evidence. Compassionate access processes may be considered.

8. Escalation of Care

- Respond to clinical deterioration as per local CERS (Clinical Emergency Response System) e.g. Rapid Response Call.
- If requiring transfer to a higher-level facility with a PICU/ICU, discuss with PICU/NETS early.
- Consider early discussion with PICU/NETS in patients with clinical concerns of severe complications such as myocarditis or encephalitis or who have evidence of shock.

9. Management of respiratory failure

- Unless confirmed or strong suspicion of COVID-19, management will be as per clinical indication including the use of HFNP and NIV
- In **confirmed** COVID-19, use of non-invasive ventilation (NIV) is **not recommended**. NIV for COVID-19 is associated with a high failure rate, delayed intubation and possibility increased risk of aerosolization with poor mask fit.
- Aim for early intubation and positive pressure ventilation in those who are deteriorating. For further information on airway management, ventilator strategies and other management see:
  - ANZICS COVID-19 Guideline
  - CEC – Airway Management: Respiratory Precautions

- If a suspected or confirmed COVID-19 patient has a cardiac/respiratory arrest, see revised COVID-19 specific paediatric ALS algorithm (hyperlink)

10. Paediatric Inflammatory Multisystem Syndrome (PIMS-TS)

- Paediatric Inflammatory Multisystem Syndrome (PIMS-TS) is also known as Multisystem Inflammatory Syndrome in Children (MIS-C)
- PIMS-TS is a serious delayed complication (from about 4 weeks post infection) of SARS-CoV-2 infection. The pathogenesis of PIM-TS remains unknown, but the syndrome is presumed to be post-infectious. Patients may present with Kawasaki disease-like features with persistent fever, multisystem organ involvement and shock.
- Current Diagnostic Criteria are as follows:
    - Patients aged < 21 years presenting with persistent fever> 38.5°C , laboratory evidence of inflammation and evidence of clinically severe illness requiring hospitalisation with multisystem (i.e., more than two) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic, or neurological)
      AND
      No alternative plausible diagnoses
      AND
      Positive for current or recent SARS-CoV-2 infection by RT-PCR, antigen test, or serology; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms.

- First line treatment may include IVIG (2 g/kg per dose) and IV corticosteroids (irrespective of oxygen status).
- IL-6 inhibitors may be considered second line.
- There is no role of remdesivir unless acute symptoms of COVID-19 are present.
- Consider consultation with a Paediatric Immunologist

11. Palliative and End of Life Care

- If intensive medical intervention fails or is unable to be provided, ensure symptom control and end of life care is provided – advice can be obtained from the paediatric palliative care team based at the John Hunter Children's Hospital
- COVID-19 patients who are receiving end of life care should be moved to a single room if available, and be allowed to have parents/carers attend. The parents/carers should represent the family. Staff should support virtual visiting for other family members (e.g. using Facetime or Skype). Visitors must use appropriate PPE and should be regarded as "close contacts" and advice should be sought from the Public Health Unit as to period of isolation required.
- If a patient dies from COVID-19, please see Care of the Deceased – Coroners and Care of the Deceased – Non Coroners (hyperlink).

12. Discharge planning and release from isolation

The requirement for 2 negative PCRs prior to release from isolation has been removed for most patients, including those going into high-risk settings. It only remains for those who are still symptomatic but 15–20 days from symptom onset, or for immunosuppressed patients.

1) If a patient hospitalised with COVID-19 is clinically ready for hospital discharge, they can be discharged to isolation at home or in another facility, and isolation should continue until:

- at least 14 days have passed since the onset of symptoms;
  AND
- resolution of all symptoms of the acute illness for the previous 72 hours

Discuss with the COVID Care Home team, contactable on 0428112384 or HNELHD-GreaterNewcastleHITHCOVID@health.nsw.gov.au

2) If a patient hospitalised with COVID-19 has not had complete resolution of respiratory symptoms, isolation should continue until:

- at least 20 days after the onset of symptoms
  AND
- the patient is not significantly immunocompromised

OR

- at least 14 days have passed since the onset of symptoms
  AND
- there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)
  AND
- the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 10 days from symptom onset.

3) If a patient is significantly immunocompromised they must have 2 negative PCRs collected at least 24 hours apart, at least 7 days from symptom onset, prior to release from isolation.

NOTES

- If a patient who has been cleared as above requires re-admission to hospital, they do NOT need to be retested and isolated UNLESS they have developed NEW unexplained fever or acute unexplained respiratory symptoms
- If a patient has an ongoing post-viral cough OR ongoing chronic pre-existing cough/SOB, they can be cleared from isolation if they meet all of the above criteria (i.e. these patients can still be considered to have resolution of the acute illness). If this chronic cough is productive, the sputum should be shown to be SARS-CoV-2 PCR negative prior to release from isolation.
- Ensure discharge summary is completed with clear information to the general practitioner including episode of care and required follow up arrangements.