Clinical Care of Paediatric Patients During the COVID-19 Pandemic

Scope (Staff): All staff
Scope (Area): CAHS

Child Safe Organisation Statement of Commitment
CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

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Aim
To provide guidance on the clinical care of paediatric patients during the COVID-19 pandemic.

Risk
Non-compliance with this guideline may impact patient care and safety.

Key Points
- Disclaimer: These guidelines are based on current available knowledge and will change as more evidence becomes available about SARS-CoV2 and the disease it causes, COVID-19.
- Disclaimer: This document has been developed primarily for use by staff within the Child and Adolescent Health Service (CAHS). For non-CAHS practitioners these should be used in combination with their own health service guidance.
- Most children with COVID-19 have a mild illness which may be indistinguishable from other common endemic viral illnesses e.g. rhinovirus, respiratory syncytial virus (RSV), influenza A/B.
- SARS-CoV-2 NAAT remains the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection and should be requested where system capacity allows.
- Pre-existing treatment protocols and guidelines for common paediatric conditions such as bronchiolitis, viral wheeze/asthma and lobar pneumonia should be followed.
- All efforts should be made to reduce the need for aerosol generating procedures (AGPs), and especially so in patients meeting the positive COVID-19 case definition or those with an epidemiological risk factor for COVID-19 infection. If an AGP is required, HCWs should use a fit tested P2 or N95 respirator and protective eyewear.
- In alignment with the WA Health mandatory policy for the Identification and use of personal protective equipment (PPE) in the clinical setting during the COVID-19 pandemic, it is advised that all COVID-19 positive patients admitted to hospital are admitted to a single room, preferably a negative pressure isolation room (NPIR). Personal Protective Equipment (PPE) consistent with Standard, Contact & Airborne precautions (gown, gloves, P2/N95 respirator and protective eyewear) should be used when entering a COVID-19 cohort area and/or on entry to the room of a positive COVID-19 patient.
- In Western Australia, asymptomatic individuals under a current quarantine direction are to be managed in the hospital environment in the same way as positive COVID-19 cases.

Case definitions
Patients who meet the following case definitions should be managed as a positive case:

COVID-19 positive: Refer to the CDNA case definitions to ensure current criteria are referenced.

Who to test for SARS-CoV-2?
- SARS-CoV-2 NAAT remains the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection and should be requested where system capacity allows.
• All people who have at least one of the following symptoms (clinical features) of COVID-19 infection should be tested for SARS-CoV-2:
  o **Acute respiratory symptoms** (cough and/or sore throat and/or shortness of breath), or
  o **Fever ≥37.5°C** or history of fever (e.g. night sweats or chills) where no other cause is identified*( *Patients who have an alternate cause for their fever identified (e.g. urinary tract infection, appendicitis) do not meet this diagnostic criterion), or
  o **Loss of taste or smell**.

Other non-specific symptoms of COVID-19 that should prompt consideration for COVID-19 testing include unexplained fatigue, headache, acute nasal congestion, rhinorrhoea, diarrhoea, nausea/vomiting, myalgia, arthralgia, and loss of appetite.

**Symptomatic patients**

All patients who have a new clinical feature of COVID-19 infection (as outlined above) should be tested for SARS-CoV-2 using NAAT unless they have already had infection confirmed by a positive SARS-CoV-2 NAAT in the past 14 days.

**Asymptomatic patients**

• As we progress through the pandemic response phases as outlined in the WA Health COVID-19 Framework for System Alert & Response (SAR), the testing recommendations for asymptomatic individuals will change based on hospital activity and health system and pathology capacity.

• During the transition to the amber response phase, SARS-CoV-2 testing should be incorporated into screening for asymptomatic individuals presenting for an unplanned admission where an epidemiological risk factor for COVID-19 exists.

**Epidemiological risk factors**

Epidemiological risk factors are those that increase the likelihood of recent exposure to COVID-19 and include:

• Close contact with a positive COVID-19 case.

• Visitation of an exposure site within the past 14 days.

• A current quarantine direction is in place.


**How to test**

**Nasopharyngeal specimen collection and transport for COVID-19 NAAT (PCR):**

• Clinicians must complete pathology request form to include patient symptoms & presence of COVID-19 epidemiological risk factors to assist with prioritisation of testing.

• For admitted patients, additional respiratory virus testing (“Respiratory Virus NAAT”) is recommended and should be requested on the same sample.

• Note that patients cannot be sent to the PCH PathWest Collection Centre for the purpose of COVID-19 swab collection as patient flow requirements for COVID-19...
testing clinics cannot be maintained at this site.

- Use a single dry nasopharyngeal flocked swab for PCR testing:
  - Measure the distance from the nose to the ear to provide an estimate of the distance to insert the swab.
  - The swab should be inserted once into the nasopharynx by directing the swab in line with the nasal floor. This is a specific CAHS recommendation as multiple site sampling is potentially distressing for children without clear evidence of increased viral detection.
  - Once the swab has been inserted, leave for a few seconds to absorb secretions and then rotate on withdrawal.
  - Re-sheath swab following collection.
  - Do NOT pour transport medium into the sheath as they are not designed to hold liquid.
  - Place the specimen into a plastic specimen bag for transport to PathWest at QEII. Swab samples collected for COVID-19 PCR can be sent to the central specimen reception at PathWest QEII via the pneumatic tube system.
  - Urgent samples should be walked to PathWest Central Specimen Reception, Ground floor PP Block. No additional PPE is required for those delivering swabs.

- For further details, refer to the Nasopharyngeal & Throat Swab Collection procedure document in the CAHS Clinical Practice Manual.
  - Due to changes in swab manufacturing and supply during the pandemic, the swabs available at PCH may vary. Refer to the Floq swab information guide for further information on current stocks and supplies.
  - PathWest has a domiciliary service that can provide in-home specimen collection for patients with chronic illnesses (e.g. immunosuppression), where presentation to a COVID-19 clinic may not be preferable or possible. Bookings can be made by contacting pathwestcovid19collections@health.wa.gov.au or 6386 4790.

**Figure 1:** Paediatric flocked swab and sheath

**Figure 2:** Collection technique for a nasopharyngeal swab
To prioritise testing of admitted patients it is recommended that the clinician:

1) Documents that the child is being admitted to hospital on the pathology request form together with the clinical details and COVID-19 risk factors.

2) Calls the Clinical Microbiology Registrar (in-hours) or Consultant (after hours) to discuss test prioritisation for urgent cases.

Automatic approval for rapid PCR (Xpert® SARS-CoV2 PCR) will be given in the current pandemic response phase for samples collected in the Emergency Department or Paediatric Critical Care with use of a pre-filled request form in the following circumstances:

- The patient has clinical feature(s) of or epidemiological risk factors for COVID-19, and
- They require emergency surgery or an aerosol generating procedure (including intubation).

The requesting consultant’s name must be documented on the form as well as the phone number for result notification and indication for rapid testing.

**Sampling for the purposes of rapid antigen testing (RAT):**

- The sampling requirements for COVID-19 RAT vary according to the specific kit in use
- This section will be updated as further information becomes available as to which RAT kits have been procured by CAHS for use in paediatric patients

**COVID-19 NAAT test reporting**

**Negative COVID-19 NAAT results**

- Families of all discharged children who have symptoms consistent with COVID-19 infection should be advised to remain in isolation at home pending the result of their COVID-19 NAAT. Families should be given an information sheet with instructions on how to self-isolate effectively.
  - Families should be informed that the nominated next of kin will receive an automated text message from the Department of Health with their child’s COVID-19 NAAT result.
  - Families can be referred to the COVID-19 test result enquiry line on 1800 313 223 (8AM - 4PM, 7 days per week) if their results have not been received after 48 hours.

**Positive COVID-19 NAAT results**
If a child tests positive for COVID-19 on a sample collected at PCH, the Public Health unit will notify the next of kin nominated on the request form of the result by SMS.

This notification will be followed up by a message from the COVID Care at Home team to provide additional information and risk stratify based on clinical and social circumstances.

- Those patients meeting the criteria for medium or high risk will be referred to the State-wide Paediatric & Adolescent Remote Care – COVID (SPARC-COVID) program run through PCH.

The Public Health Operations (PHOps) team will arrange contact tracing and inform the family when home isolation is no longer required.

The treating team do not need to make a Public Health notification as a positive COVID-19 PCR result will generate a laboratory notification.

**COVID-19 serological testing**

- Serology is not currently used for diagnosis of acute illness but may have a role in retrospective confirmation of past SARS-CoV2 infection.
  - At present it is only being used to assist with Public Health lead investigations.

**Other Laboratory and Medical Imaging Investigations in the Setting of Acute COVID-19 Infection**

- The role of laboratory (biochemistry and haematology) and radiological investigations is in detection of complications or excluding alternative diagnoses.

Investigations suggested for suspect or positive COVID-19 cases:

- Mild illness: Nil
- Moderate illness:
  - Consider chest x-ray to rule out lobar pneumonia, effusion, cavitation.
- Severe illness:
  - Chest x-ray to rule out lobar pneumonia, effusion, cavitation.
  - Consider blood gas, full blood picture (FBP), electrolytes/urea/creatinine (EUC) and liver function tests (LFTs).
- Critical illness:
  - Chest x-ray.
  - Assessments of end organ function including blood gas/lactate, FBP, EUC, LFTs, coagulation profile.

**Infection control principles**

**Transmission-based precautions**

- Standard precautions always apply with all patients.
- Standard contact and airborne precautions (Fit-tested N95 or P2 respirator, protective eyewear, gown and gloves) are required for care of all patients who fulfil the positive COVID-19 case definition during all response phases of the pandemic.
This also applies to asymptomatic patients with epidemiological risk factors under a quarantine direction.

- All efforts should be made to reduce the need for aerosol generating procedures. Where an AGP is required, as per the current WA Health COVID-19 Framework for System Alert & Response (SAR), healthcare workers (HCWs) should use a fit-tested P2 or N95 respirator and protective eyewear when performing an AGP throughout all phases of the pandemic response.

- The Transmissible Diseases Index (TDI) should be referred to information on required transmission based precautions where an alternate infectious disease diagnosis or clinical syndrome exists.

**Amber alert level response**

During the amber phase of the pandemic response as per the current SAR the following additional measures are required within healthcare facilities:

- A surgical mask must be worn by all staff from entry to the facility until exiting at the end of their shift.
- All HCWs working in clinical areas should add protective eyewear
- In the Emergency Department, all staff in clinical areas should wear a fit-tested P2 or N95 respirator and protective eyewear.
- For detailed IP&C advice please refer to the following documents:
  - CAHS COVID-19 Infection Control, Patient Flow and Staff Health guideline.
  - WA Department of Health Policy Framework: Identification and Use of Personal Protective Equipment in the Clinical Setting During the Coronavirus (COVID-19) Pandemic Policy
COVID-19 Testing Guidelines & Transmission Based Precautions for Unplanned Admissions at Interim Amber Alert Level

Effective from Monday, February 7th until further notice

PCR Confirmed COVID-19

No further testing required

Probable Covid-19

Rapid Antigen Test positive

Rapid Antigen Test negative

PCR test result pending

Positive PCR Test

Standard Contact and Airborne Precautions
- Fit Tested P2 or N95 Respirator
- Protective Eyewear, Gown & Gloves

Priority for a negative pressure isolation room (NPIR) or transfer to a bed on the 2A cohort ward once activated

Clinical Features of COVID-19

OR

Exposed to COVID-19 within the last 14 days (epidemiological risk)

Asymptomatic but

Close contact with a confirmed case

OR

Have been at a listed COVID-19 exposure site

OR

Under a current quarantine direction

Negative PCR Test WITH acute respiratory symptoms

Maintain Standard Contact and Airborne Precautions while COVID PCR result pending
- Prioritise for single room
- Fit Tested P2 or N95 Respirator, Protective Eyewear, Gown & Gloves

Standard Contact and Droplet Precautions

- Single room
- Surgical Mask, Protective Eyewear, Gown & Gloves

For those exposed to COVID-19 within the last 14 days, continue to follow any quarantine order that is in place

If an AGP is required a fit tested P2 or N95 respirator & protective eyewear should be used

Negative PCR Test with NO acute respiratory symptoms

Standard Precautions or Refer to the Transmissible Diseases Index

For those exposed to COVID-19 within the last 14 days, continue to follow any quarantine order that is in place

If an AGP is required a fit tested P2 or N95 respirator & protective eyewear should be used

No clinical features of epidemiological risk for COVID-19
COVID-19 Testing Guidelines & Transmission Based Precautions for Unplanned Admissions at Red Alert Level

Effective from Friday, March 4th until further notice

PCR Confirmed COVID-19

- No further testing required
- Standard, Contact and Airborne Precautions
  - Fit Tested P2 or N95 Respirator
  - Protective Eyewear, Gown & Gloves

Probable COVID-19

- With clinical features of COVID-19
- Exposed to COVID-19 within the last 14 days (epidemiological risk)
- Asymptomatic but:
  - Close contact with a confirmed case
  - Have been at a listed COVID-19 exposure site
  - Under a current quarantine direction

- Rapid Antigen Test positive
  - PCR (standard) pending
- Rapid Antigen Test negative
  - PCR (standard) result pending

Confirmed COVID-19

- COVID Transport Team required
  - Prioritise for a negative pressure isolation room (NPIR) or transfer to a bed on the 2A cohort ward once activated

Nurse and PCA to wear contact + airborne precautions for transfer

Contact and Airborne Precautions for period of required isolation*
  - NPIR preferred, single room with door closed suitable alternative
  - Fit Tested P2 or N95 Respirator, Protective Eyewear, Gown & Gloves

No clinical features of or epidemiological risk for COVID-19

- Rapid Antigen Test negative
- Gown & Gloves if contact precautions also recommended as per the Transmissible Diseases Index#

Positive PCR

Negative PCR

Repeat RAT or PCR if patient remains symptomatic after 24 hours

Fit Tested P2 or N95 Respirator & Protective Eyewear (all clinical facing staff)*

Gown & Gloves if contact precautions also recommended as per the Transmissible Diseases Index#

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* Refer to the Transmissible Diseases Index for required precautions if the patient has been diagnosed with an alternate infection or clinical syndrome

* For those exposed to COVID-19 within the last 14 days, continue to follow any quarantine order that is in place

For all patients admitted from the red and amber streams, discussion with the bed manager taking into account COVID status and clinical care requirements is needed before allocation to ward 1A
Guidance on Initial Management and Infection Control Precautions for a Patient who Develops Symptoms Consistent with COVID-19 Infection during their Admission

- **Patient develops clinical symptoms of COVID-19 infection while an inpatient**
  - Collect nasopharyngeal swab for COVID-19 PCR

- **Transfer to a negative pressure isolation room (NPIR) or transfer to a bed on the 2A cohort ward once activated**
  - **Positive COVID-19 PCR**
    - **Standard, Contact and Airborne Precautions**
      - Move to a single room if in multi-bed bay
      - Fit Tested P2 or N95 Respirator
      - Protective Eyewear, Gown & Gloves

- **Negative COVID-19 PCR Test WITH acute respiratory symptoms**
  - **Standard, Contact and Droplet Precautions**
    - Single room
    - Surgical Mask, Protective Eyewear, Gown & Gloves

- **Negative PCR Test with NO acute respiratory symptoms**
  - **Standard Precautions or Refer to the Transmissible Diseases Index**
    - Refer to the CAHS Transmissible Diseases Index for required precautions if the patient has been diagnosed with an alternate infection or clinical syndrome

*Ensure that investigations and urgent management for other differential diagnoses are attended to concurrently*
Aerosol generating procedures (AGPs)

- AGPs are those that stimulate coughing and thereby promote the generation of fine airborne particles. They include:
  - Tracheal intubation and extubation.
  - Intentional or inadvertent disconnection / reconnection of closed ventilator circuit.
  - Open oropharyngeal or nasopharyngeal suctioning.
  - High frequency oscillatory ventilation (HFOV).
  - Upper respiratory tract instrumentation and/or surgery (e.g. bronchoscopy, tracheotomy).
  - Surgical or post-mortem procedures on the respiratory tract involving high speed devices.
  - Thoracic surgery that involves entering the lungs.
  - Intercostal catheter insertion for management of pneumothorax.
  - Manual or non-invasive ventilation (including BiPAP and CPAP).
  - Sputum induction & chest physiotherapy.
  - High flow nasal oxygen (HFNO).
  - Cardiopulmonary resuscitation.
  - Diagnostic instrumentation of the upper digestive tract, including transoesophageal echocardiography.
  - Nebuliser use.

- The following are not considered AGPs: NGT insertion, nasopharyngeal swab collection, low flow oxygen therapy and Nitrous Oxide administration for procedural sedation.

- Senior medical input should determine if the AGP is warranted based on clinical need. Decision making should be based on likely clinical benefit and whether an alternative exists.
  - Nebulisers should be avoided and replaced by single patient use spacers where clinically appropriate.

- If an AGP is deemed essential, the following precautions should be undertaken:

<table>
<thead>
<tr>
<th>Positive COVID-19 Infection or Epidemiological Risk (Red or Amber stream patient)</th>
<th>NO Clinical Features or Epidemiological Risk for COVID-19 Infection (Green stream patient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritise for a NPIR</td>
<td>Move to a single room with door closed</td>
</tr>
<tr>
<td>Limit the number of HCWs in the room to those who are essential</td>
<td>Limit the number of HCWs in the room to those who are essential</td>
</tr>
<tr>
<td>Attending staff must wear PPE as for standard + contact + airborne precautions (fit-tested N95 / P2 mask, protective eyewear, gown and gloves)</td>
<td>Attending staff must wear PPE as for standard + contact + airborne precautions (fit-tested N95 / P2 mask, protective eyewear, gown and gloves)</td>
</tr>
</tbody>
</table>
Admission procedures

For all positive COVID-19 patients and those who are asymptomatic but under a current quarantine direction, ensure the following:

- Notify the Hospital Clinical Manager and either Infection prevention & Control (in hours) or on-call Microbiologist (after hours) – Refer to Appendix 1
- Admit the patient to a NPIR.
  - If a NPIR is not available, preference should be given to the following:
    - Patients with positive COVID-19 infection.
    - Those admitted with an epidemiological risk factor that require aerosol generating procedures.
  - A single room with door closed is otherwise sufficient provided staff members use standard, contact and airborne transmission-based precautions.
  - The negative flow 2A cohort ward will be activated once sufficient numbers of positive COVID-19 patients have been admitted.
- Place signage regarding the appropriate transmission-based precautions outside the patient room.
- Commence a staff register.
- Ensure that only essential staff enter the patient room.
- Individual staff members and managers should refer to the Staff Allocation for Probable or Confirmed COVID-19 Patients and Clients policy for guidance on appropriate allocation.
  - All allocated staff members must be up to date with mandatory PPE training.
  - All allocated staff must have undergone fit-testing for a P2 or N95 respirator and have access to the appropriate mask.
  - All allocated staff must be fully vaccinated and have complied with their booster vaccination requirement (from January 31, 2022 a booster vaccine is required 3 months following completion of the primary vaccination course).
  - Staff members who are within an identified high-risk group for severe illness must not care for positive COVID-19 patients.

Management of positive COVID-19 infection

Management based on clinical manifestation

- Thresholds for admission/transfer of patients with acute respiratory illness currently should not change. These decisions should be based on the clinical severity of disease, not the presumed underlying viral aetiology.
- The management of suspected COVID-19 cases should follow existing PCH management guidelines including:
  - Intravenous fluid therapy
  - Pneumonia
  - Asthma
  - Bronchiolitis
Management based on severity of illness

Refer to Appendix 2 for disease severity classification in children and adolescents.

**Mild Illness**

- Children with mild disease may not require admission to hospital if respiratory and hydration status are stable and social circumstances permit discharge home.
- Symptomatic management is recommended.
- Families of children with suspect or positive COVID-19 who are discharged from hospital must be provided with both verbal and written information advising the need to remain in isolation pending the result of their COVID swab and COVID-19 (coronavirus) information for the community in Western Australia, including when and how to seek medical care in care in the event of deterioration.

**Moderate Illness**

- Children with moderate disease require admission to hospital for oxygen therapy and hydration.
- Refer to the Oxygen Administration Guideline within the CAHS Clinical Practice Manual for details.

**Severe Illness**

- Children with severe illness should be admitted to hospital and discussed with both the admitting consultant and the Paediatric Critical Care Unit.

**Respiratory Support**

- The use of high-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) should be considered for neonates, children and adolescents with hypoxaemia &/or respiratory distress associated with COVID-19 infection*.
- As HFNO and NIV are AGPs, the decision to commence these must be made in conjunction with a consultant (ED, general paediatrics, respiratory medicine, intensive care).

**Critical Illness**

- Increase inspired oxygen concentration as required.
- Manage primary pathophysiology (i.e. upper airway obstruction, asthma) whilst minimising AGPs.
- Consider endotracheal intubation and mechanical ventilation in neonates, children and adolescents with COVID-19 who continue to deteriorate despite optimised non-invasive respiratory support*. This should be discussed with a PCH PCC consultant.
  - Early intubation should be considered to prevent the additional risk posed to staff by emergency intubation
  - Refer to Consensus statement: Safe Airway Society – Principles of airway management and tracheal intubation
Intubation should be undertaken by the most experienced team member available

- The anaesthetic technique should minimise risk to patient and staff.
- Refer to the APLS guideline for Paediatric Advanced Life Support (with COVID-19 considerations) and Appendix 3.
- ETT suction should be minimised but may be essential. It should be performed with in-line suction apparatus incorporated into the airway circuit at the time of intubation.

Considerations for Ventilated Patients*

- For ventilated neonates, children & adolescents with COVID-19 infection and moderate to severe ARDS, consider using a higher positive end-expiratory pressure (PEEP) strategy.
- High frequency oscillatory ventilation (HFOV) should be limited to rescue therapy in neonates and children not responding to conventional ventilation and should not be considered a first-line mode of mechanical ventilation.
- Prone positioning should be considered in mechanically ventilated patients with COVID-19 and ongoing hypoxaemia despite ventilation optimisation.
- Recruitment manoeuvres should be considered for patients with COVID-19 and hypoxic respiratory failure characterised by severe atelectasis unresponsive to other ventilation strategies.
- Continuous infusions of neuromuscular blocking agents are not recommended routinely for intubated neonates, children and adolescents with COVID-19 infection.
- Consider early referral for venovenous or venoarterial ECMO in mechanically ventilated neonates, children and adolescents with COVID-19 with refractory respiratory and/or cardiovascular failure despite optimisation of other critical care interventions.

Disease modifying treatments

- For patients who require admission with acute COVID-19 infection and supplemental oxygen, consider use of a disease modifying agent.
- Early monoclonal antibody or antiviral therapy may be considered for high-risk patients (in discussion with Infectious Diseases).
Confirmed COVID-19

Outpatient with COVID-19

SaO₂ > 92% in RA

Continue to monitor for deterioration

If stable for d/c

Follow up as per WA Health COVID Home Monitoring. Discuss with local paediatric team as clinically indicated

Admitted because of COVID-19

Hypoxic SaO₂ < 92% in RA OR (consider if ↑RR with MET criteria)

Commence:
IV / po dexamethasone 0.15mg/kg/day (max 6mg) daily for up to 10 days*

Assess over 24-48 hrs

Deteriorating:
Flow > 30L/min + FiO₂ > 40% or non-invasive / invasive ventilation

Stabilised / Improving: Continue dexamethasone

For children > 12yo & > 40kg with < 5 days of symptoms
AND
(A) significant immunocompromise OR (B) multiple other risk factors for deterioration (and unvaccinated)

Monoclonal antibody or antiviral therapy may be considered in exceptional cases contingent on availability. Discuss with PCH Infectious Diseases

(A) Significant immunocompromise (regardless of vaccination status):
- Solid Organ Transplant (priority)
- HSCT (> 2 yrs prior) (priority)
- Haematological malignancy
- Immunosuppressive therapy*
- Severe Primary Immunodeficiency**

(B) Other risk factors for deterioration (and unvaccinated):
- Obesity (BMI > 95th centile CDC)
- Diabetes (on insulin)
- Chronic obstructive lung disease*
- Severe cardiac disease*
- CKD (GFR < 15ml/min/1.73m²)
- Complex Chronic Conditions***
- Sickle cell anemia

* Consider checking strongyloides serology if risk of previous exposure (residents in tropical regions of WA)

** Severe asthma (>1 admission in last 12 months req ICU or IV by CF / bronchiectasis with FEV < 60%, congenital tracheal stenosis, CLD with pulmonary HTN on oxygen, neuromuscular disease (requiring daytime resp support), tracheostomy req ventilation

*** Neuropathy (cerebral palsy (GMFCS 4-5 or equivalent), congenital and genetic (e.g. trisomy 21), metabolic, cardiologyopathy (on diuretics), Shunt dependent pulmonary blood flow, pulmonary HTN (on tx), single ventricle

*Immunosuppressive therapy includes: (1) Chemotherapy (2) High dose corticosteroid treatment (> 20mg/day > 14 days) (3) selected DMARDs (MMF, leflunomide, azathioprine, 6-MP), cyclophosphamide, calcineurin inhibitors (cyclosporin, tacrolimus) (4) Selected biologics / targeted therapies: Anti-CD20 antibodies (e.g. rituximab); BTK inhibitors (e.g. ibrutinib); JAK inhibitors (e.g. tofacitinib, ruxolitinib); Sphingosine-1-phosphate receptor modulators (e.g. fingolimod); Anti-CD52 antibodies (e.g. alemtuzumab); Anti-complement antibodies (e.g. eculizumab); Anti-thymocyte globulin (5) Multiple immunosuppressants where the cumulative effect is considered to be severely immunosuppressive

**PIDD including combined immunodeficiency syndromes, major antibody deficiency (e.g., CID/ XLA), defects of innate immunity (including phagocytic cells), defects of immune regulation, complement deficiencies
Refer to the Australian Guidelines for the Clinical Care of People with COVID-19 (National COVID-19 Clinical Evidence Taskforce) for regularly updated recommendations.

Paediatric Inflammatory multisystem Syndrome (PIMS-TS)

- PIMS-TS is a rare but severe complication that occurs in around 1 in 3000 children 2-6 weeks following SARS-CoV-2 infection. Some features overlap with Kawasaki disease, toxic shock syndrome and sepsis.
- Consider PIMS-TS in the differential diagnosis in children presenting with rash, conjunctival injection, abdominal pain, vomiting / diarrhoea or shock.
- Clinical condition can deteriorate rapidly; early recognition and timely initiation of appropriate therapy is important.

**Definition**

- PIMS-TS is defined by:
  - Persistent fever > 38.5°C
  - AND
  - Inflammation (neutrophilia, elevated C-reactive protein, lymphopaenia) AND
  - Evidence of single or multi-organ dysfunction
  - AND
  - Exclusion of any other microbial cause other than SARS-CoV-2 (including bacterial sepsis, staphylococcal or streptococcal shock syndromes and infections associated with myocarditis).

- There may be overlap with children fulfilling partial or full criteria for Kawasaki disease.
- SARS-CoV-2 PCR testing may be positive or negative.

All patients have the associated laboratory findings of abnormal fibrinogen, high C-reactive protein, high D-dimers, high ferritin, hypoalbuminaemia, lymphopaenia

**Investigations**

- **Bloods**
  - FBC, UEC, LFT, CRP, ESR
  - venous blood gas, lactate, glucose
  - coagulation profile, D-dimer
  - ferritin, LDH, CK
  - troponin
  - SARS-CoV-2 serology (and serum to store).
- **Respiratory virus PCR (including SARS-CoV-2).**
- **ECG.**
- **Echocardiography.**
**Management**

- Appropriate supportive management should be commenced and specific measures for hypotension or shock instituted urgently if required. Children with shock should be referred to intensive care as appropriate.

- Administer empiric antibiotics if features of sepsis present.

- Because of the potential for rapid deterioration, early transfer to a paediatric hospital with intensive care facilities is recommended for patients with suspected or confirmed PIMS-TS.

- Children and adolescents who have suspected PIMS-TS should be discussed and managed by a multidisciplinary team that may consist of members from the following departments including, but not limited to:
  - General Paediatrics.
  - Paediatric Rheumatology.
  - Paediatric Infectious Diseases.
  - Paediatric Cardiology.
  - Paediatric Critical Care.

- IV Methylprednisolone (2 – 10mg/kg/day) and Immunoglobulin (2g/kg per dose) should be commenced in children and adolescents who meet PIMS-TS criteria or have features of Kawasaki disease related to COVID-19. The higher dose of methylprednisolone should be used in patients presenting with features of shock.

- Most children will respond to pulse methylprednisolone. If the lower dose has been commenced and fever and inflammatory changes persist, consider increasing the dose to 10mg/kg/day. Additional immunomodulatory agents (anti-IL-1, anti-IL-6, anti-TNF) should be considered as third-line options in children and adolescents with PIMS-TS who do not respond to IV immunoglobulin and corticosteroids.

- Children who are treated for PIMS-TS should also be prescribed low-dose aspirin (3-5mg/kg) once daily for at least six weeks.

- Refer to the Australian Guidelines for the Clinical Care of People with COVID-19 (National COVID-19 Clinical Evidence Taskforce) for regularly updated recommendations.

**Discharge of positive COVID-19 patients or those under a current quarantine direction from PCH**

- Refer to the Department of Health hospital discharge guidelines for positive COVID-19 patients for comprehensive advice on this subject.

- Discharge planning should focus on ensuring that patients are discharged to an appropriate setting with the necessary information and follow-up plans in place.

- The treating team must assess the patient’s need for post-hospital services and the availability of such services prior to discharge.

- As a requirement for contact tracing, Public Health MUST be notified when a positive COVID-19 patient is discharged from hospital:
  - Call 1300 316 555 (8AM – 8PM, 7 days) OR
  - Email: ncovcontact@health.wa.gov.au
The following information is required:

- Name & DOB.
- COVID status (e.g. already cleared during admission).
- Issues during admission including need for ICU admission.
- Projected discharge destination (home or hotel quarantine or residential facility).
- Next of kin (NOK) contact details.
- Support status on discharge (e.g. can their NOK reply to SMS or phone call or is there a family member better placed to reply to correspondence).
- Symptomatic or asymptomatic on day of discharge.

If a patient is unable to be discharged back to their place of residence, hotel or private accommodation should be arranged with the assistance of the State Welfare Incident Control Centre on COVIDSupport@communities.wa.gov.au or by calling 13 COVID.

Patients remaining under a quarantine direction (e.g. returned international traveller) MUST have their discharge and transport co-ordinated with the State Health Incident Co-ordination Centre:

- Contact 9222 2017 (24 hours per day, 7 days per week) OR
- Email: SHICC.covidoperations@health.wa.gov.au
- Patients should only be discharged if they are well enough to return to hotel room quarantine where limited face-to-face interaction is expected.

The following principles apply for transport of patients following discharge:

- A private vehicle should be the first choice of transport for discharging a patient to home (family’s car or a lift from a family member or close friend).
- The patient should wear a mask provided by the hospital, where possible, unless the patient has already been cleared by time of discharge.
- If transport cannot be organised or transfer back to a state quarantine facility is required, a transport request should be made through the SHICC COVID operations:
  - Call 9222 2017 (24 hours per day, 7 days per week) OR
  - Email: SHICC.covidoperations@health.wa.gov.au
  - If a taxi or ride share is used, the driver and patient/family should refer to the Department of Health Taxi and rideshare drivers – stay COVID safe.
Contributors

The following people have contributed to the development and revisions of this guideline:

- Michael Baker   Co-HOD Emergency Department PCH
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- Daniel Yeoh  Infectious Diseases Physician PCH
## References


## Related CAHS internal policies, procedures and guidelines

- CAHS [COVID 19 Infection Control, Patient Flow and Staff Health](#) guideline
- CAHS [Staff Allocation for Probable or Confirmed COVID-19 Patients or Clients](#)

## Useful resources

- ANZICS - COVID-19 Guidelines
- National COVID-19 Clinical Evidence Taskforce – Caring for people with COVID-19
- Australian Department of Health: Communicable Diseases Network of Australia. COVID-19 National Guidelines for Public Health Units (SoNG)
## CAHS COVID-19 Resources: Guideline

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<tr>
<td>Reviewer / Team:</td>
<td>Clinical Microbiology</td>
</tr>
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<td>CAHS COVID Executive Oversight Committee (CCEOC)</td>
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Appendix 1: Process for Admission of a Positive COVID-19 Patient or Patient from Hotel Quarantine

PCH Notification Process for Admission of a Positive COVID-19 Patient or Patient from Hotel Quarantine

Hotel GP or Ambulance contact PCH regarding transfer of hotel quarantine patient

ED Consultant

Infection Prevention and Control or On-call Clinical Microbiologist*

CAHS COVID-19 Team

Attending ED Doctor

Admitting team

ED Nurse Co-ordinator

Hospital Clinical Manager

Executive On-call

Chief Executive & Executive Director of Medical Services *

Key Contacts

<table>
<thead>
<tr>
<th>Department</th>
<th>Phone Number</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHICCCOVID Ops (24/7)</td>
<td>9222 2017</td>
<td><a href="mailto:SHICCCovidoperations@health.wa.gov.au">SHICCCovidoperations@health.wa.gov.au</a></td>
</tr>
<tr>
<td>Public Health Operations (PHOps)</td>
<td>1300 315 555</td>
<td><a href="mailto:PHOpsClinical@health.wa.gov.au">PHOpsClinical@health.wa.gov.au</a></td>
</tr>
<tr>
<td>COVID-19 WA Police Line</td>
<td>131 444</td>
<td><a href="mailto:covid19.wapol.health.liaison@police.wa.gov.au">covid19.wapol.health.liaison@police.wa.gov.au</a></td>
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* To discuss isolation requirements, transmission-based precautions, COVID-19 testing & additional management (e.g. staff log)

* Notify in the event of admission of a COVID-19 positive patient.
## Appendix 2: Definition of Illness Severity for Children and Adolescents

<table>
<thead>
<tr>
<th>Severity</th>
<th>Feeding / Hydration</th>
<th>Conscious State</th>
<th>Respiratory / Vital signs</th>
<th>Oxygen requirement</th>
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<tbody>
<tr>
<td><strong>Mild Illness</strong></td>
<td>Normal or mildly reduced feeding</td>
<td>Normal</td>
<td>No or mild respiratory symptoms OR No or mild work of breathing</td>
<td>No supplemental oxygen required to maintain SpO2 &gt; 92%</td>
</tr>
<tr>
<td><strong>Moderate Illness</strong></td>
<td>Unable to maintain hydration without NG or IV fluids</td>
<td>Normal</td>
<td>Moderate work of breathing OR Abnormal vital signs for age OR Brief, self-resolving apnoea (infants)</td>
<td>Requires low-flow oxygen (nasal prongs or mask) to maintain SpO2 &gt; 92%</td>
</tr>
<tr>
<td><strong>Severe Illness</strong></td>
<td>Unable to maintain hydration without NG or IV fluids</td>
<td>Drowsy / tired but easily rousable</td>
<td>Moderate-severe work of breathing OR Abnormal vital signs for age with breaches of early warning criteria OR Apnoea needing support / stimulation (infants)</td>
<td>Requires high-flow oxygen at 2L/kg/min to maintain SpO2 &gt; 92%</td>
</tr>
<tr>
<td><strong>Critical Illness</strong></td>
<td>Unable to maintain hydration without NG or IV fluids</td>
<td>Altered conscious state / unconscious</td>
<td>Unable to maintain breathing or prevent apnoea without advanced modes of support OR Persistently abnormal vital signs for age OR Haemodynamically unstable without inotropic or vasopressor support OR Other organ failure</td>
<td>Requires advanced modes of support to maintain oxygenation: High-flow nasal oxygen at &gt; 2L/kg/min OR Non-invasive ventilation OR Intubation and mechanical ventilation OR Extracorporeal membrane oxygenation (ECMO)</td>
</tr>
</tbody>
</table>

Based on the Australian Guidelines for the Clinical Care of People with COVID-19: Definition of disease severity for children and adolescents, National COVID-19 Clinical Evidence Taskforce.
Appendix 3: Paediatric Advanced Life Support (with COVID-19 considerations)