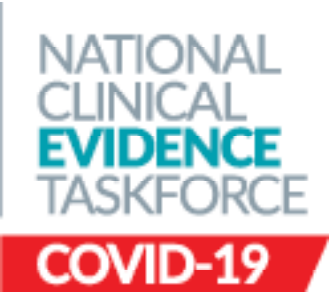


# CARE IN HOSPITAL FOR CHILDREN AND ADOLESCENTS WITH SEVERE TO CRITICAL COVID-19

**IMPORTANT**  
This information is no longer being updated.  
Users acknowledge that this information may not be accurate, relevant or complete



FORMS OF GUIDANCE

Evidence-Based Recommendation (EBR)  
Consensus Recommendation  
Good Practice Point

Types of EBRs

RECOMMENDATION FOR USE

RECOMMENDATION AGAINST USE

CONDITIONAL RECOMMENDATION FOR USE

CONDITIONAL RECOMMENDATION AGAINST USE

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| General                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <div>PATIENTS</div> <div><ul style="list-style-type: none"><li>• This flowchart applies to children in hospital because of COVID-19.</li><li>• This flowchart applies to children under 16 years of age.</li><li>• Depending on the physical size and/or developmental status of the patient, either the paediatric or adult flowcharts can be applied.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Definition of disease severity<br><b>SEVERE ILLNESS</b><br>Any one of:<br><b>Respiratory/vital signs</b> <ul style="list-style-type: none"><li>• Moderate-severe work of breathing</li><li>• Abnormal vital signs for age (tachycardia, tachypnoea) with breaches of Early Warning Criteria (e.g. Medical Emergency Team [MET])</li><li>• Apnoea needing support / stimulation (infants)</li></ul> <b>Oxygen requirement</b> <ul style="list-style-type: none"><li>• Requires high-flow oxygen or non-invasive ventilation</li></ul> <b>Feeding/hydration</b> <ul style="list-style-type: none"><li>• Poor feeding, unable to maintain hydration without nasogastric or IV fluids</li></ul> <b>Conscious state</b> <ul style="list-style-type: none"><li>• Drowsy / tired but easily rousable</li></ul><br><b>CRITICAL ILLNESS</b><br>Any one of:<br><b>Respiratory/vital signs</b> <ul style="list-style-type: none"><li>• Unable to maintain breathing or prevent apnoea without advanced modes of support</li><li>• Abnormal vital signs for age with persistent breaches of Early Warning Criteria (e.g. MET)</li><li>• Haemodynamically unstable without inotropic or vasopressor support</li><li>• Other organ failure</li></ul> <b>Oxygen requirement</b> <ul style="list-style-type: none"><li>• Requires advanced modes of support to maintain oxygenation</li><li>• Intubation and mechanical ventilation</li><li>• Extracorporeal membrane oxygenation (ECMO)</li></ul> <b>Feeding/hydration</b> <ul style="list-style-type: none"><li>• Poor feeding, unable to maintain hydration without nasogastric or IV fluids</li></ul> <b>Conscious state</b> <ul style="list-style-type: none"><li>• Altered conscious state / unconscious</li></ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <div>FLUID MANAGEMENT</div> <div><div>GOOD PRACTICE POINT</div><div>In all patients with confirmed or presumed moderate to severe COVID-19, undertake fluid management as per usual considerations for severe illness, which may include restrictive fluids.</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <div>VTE PROPHYLAXIS</div> <div><div>CONSENSUS RECOMMENDATION</div><div><div>Thromboprophylaxis</div><div>For all children and adolescents hospitalised for COVID-19, the following are recommended to prevent thrombosis, based on age and risk assessment.<ul style="list-style-type: none"><li>• In children and adolescents aged <b>12 years and over</b> who are hospitalised specifically for COVID-19 treatment and with no contraindications to anticoagulants*, use prophylactic doses of LMWH* and mechanical thromboprophylaxis (TED stockings or calf compressors) until discharge from hospital.</li><li>• In children <b>less than 12 years old</b> who are hospitalised specifically for COVID-19 treatment and <b>with either D-dimer levels &gt; 5 x upper limit normal, or additional thrombosis risk factors</b>^ (including hospital associated VTE), use prophylactic doses of LMWH* and mechanical thromboprophylaxis (TED stockings or calf compressors) where suitable based on size and mobility until discharge from hospital.</li></ul></div></div></div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <div>DRUG TREATMENTS</div> <div><div>Consider eligibility for drug treatments, depending on time since symptom onset and lab features (e.g. CRP).</div><div>There are limited data on the efficacy of drug treatment in children and adolescents.</div><div><b>Refer to:</b><ul style="list-style-type: none"><li>• Summary of recommendations in <a href="#">DRUG TREATMENTS FOR CHILDREN AND ADOLESCENTS WITH COVID-19</a> Clinical Flowchart</li></ul></div></div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Supportive care                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Respiratory support                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <div>NON-INVASIVE</div> <div><div>CONSENSUS RECOMMENDATION</div><div><div>HFNO or NIV</div><div>Consider using high-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) therapy for neonates, children and adolescents with hypoxaemia or respiratory distress associated with COVID-19 and not responding to low-flow oxygen. Use it with caution and pay strict attention to staff safety, including the use of appropriate PPE.</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <div><div>CONSENSUS RECOMMENDATION</div><div><div>Respiratory management of deteriorating child</div><div>Consider endotracheal intubation and mechanical ventilation in neonates, children and adolescents with COVID-19 who are deteriorating despite optimised, non-invasive respiratory support.</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <div><div>CONSENSUS RECOMMENDATION</div><div><div>Prone positioning</div><div>For neonates, children and adolescents with COVID-19 and respiratory symptoms who are receiving non-invasive respiratory support, consider prone positioning if patient co-operation is possible. When positioning a patient prone, ensure it is used with caution and close monitoring of the patient.</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <div><div>CONDITIONAL RECOMMENDATION FOR</div><div><div>Videolaryngoscopy</div><div>In neonates, children and adolescents with COVID-19 undergoing endotracheal intubation, consider using videolaryngoscopy over direct laryngoscopy if available and the operator is trained in its use.</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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Please refer to footnotes located on page 2 of this flowchart.

| Respiratory support continued | MECHANICAL VENTILATION                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|                               | <div><div>CONSENSUS RECOMMENDATION</div><div><b>Prone positioning</b><br/>For mechanically ventilated neonates, children and adolescents with COVID-19 and hypoxaemia despite optimising ventilation, consider prone positioning if there are no contraindications.</div></div>                                                                                                                              | <div><div>CONSENSUS RECOMMENDATION AGAINST</div><div><b>Neuromuscular blockers</b><br/>For intubated neonates, children and adolescents with COVID-19, do not routinely use continuous infusions of neuromuscular blocking agents (NMBAs).<br/>However, if effective lung-protective ventilation cannot be achieved, consider targeted intermittent use of NMBAs. If indicated, the choice of NMBA should be guided by the age group and regional practice.</div></div> |
|                               | <div><div>CONSENSUS RECOMMENDATION</div><div><b>Positive end-expiratory pressure</b><br/>For mechanically ventilated neonates, children and adolescents with COVID-19 and moderate to severe ARDS with atelectasis, consider using a higher PEEP strategy over a lower PEEP strategy. The absolute PEEP values that constitute a high and low PEEP strategy will depend on age and patient size.</div></div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                               | <div><div>CONSENSUS RECOMMENDATION</div><div><b>Recruitment manoeuvres</b><br/>For mechanically ventilated neonates, children and adolescents with COVID-19 and hypoxic respiratory failure characterised by severe atelectasis unresponsive to other ventilation strategies, consider using recruitment manoeuvres.</div></div>                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                               | <div><div>GOOD PRACTICE POINT</div><div>In neonates and infants, staircase or stepwise incremental recruitment manoeuvres should only be performed using mean airway pressure in a high-frequency oscillatory ventilation mode. Staircase or stepwise (incremental PEEP) recruitment manoeuvres should not be performed during conventional ventilation.</div></div>                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                               | ECMO                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                               | <div><div>CONSENSUS RECOMMENDATION</div><div><b>Extracorporeal membrane oxygenation</b><br/>Consider early referral to an ECMO centre for venovenous or venoarterial ECMO in mechanically ventilated neonates, children and adolescents with COVID-19 with refractory respiratory or cardiovascular failure despite optimising other critical care interventions.</div></div>                                | <div><div>Key source</div><div><b>National Clinical Evidence Taskforce</b> – Australian guidelines for the clinical care of people with COVID-19.</div></div>                                                                                                                                                                                                                                                                                                           |

# Contraindications to thromboprophylaxis

- Stroke / intracranial haemorrhage
- Any bleeding from any site / uncontrolled bleeding
- Likely to need surgery in <24 hours
- Congenital bleeding disorder (e.g. Von Willebrand Disease, haemophilia)
- Platelets <50x10<sup>9</sup>/L and/or INR >1.8
- Uncontrolled hypertension

Consider unfractionated heparin (UFH)

\* Dose of low molecular weight heparin (LMWH)

- ≥3 months old – enoxaparin 0.5 mg/kg BD (max 60 mg BD)
- <3 months old – enoxaparin 0.75 mg/kg BD
- UFH is an alternative to LMWH and can be considered if there is potential for surgical intervention, renal impairment or other clinical factors that would normally favour UFH over LMWH. Dosing should be advised by paediatric haematology.

Where eGFR is <30 mL/min/1.73 m<sup>2</sup>, UFH or clearance-adjusted doses of LMWH may be used (discuss with paediatric haematologist).

^ Thrombosis risk factors

- Admission to PICU
- Obesity (BMI >95th centile)
- Central venous catheter
- Length of stay anticipated >3 days
- Immobility that is not longstanding
- Personal history of VTE
- Known thrombophilia
- First degree relative with VTE
- Active malignancy
- Recent surgery / trauma
- Severe dehydration
- Underlying medical condition: nephrotic syndrome, cystic fibrosis, sickle cell disease, cardiac disease, chronic inflammatory disorder (juvenile idiopathic arthritis, inflammatory bowel disease), post splenectomy