

QEDSAP / SICCN / SWAPNET

Joint statement

Management of Respiratory Failure in the response to COVID-19

This statement should be viewed as a living document and may need to be updated and revised as more information is acquired on the best practice in the management of respiratory failure in the COVID-19 patient group.

The Queensland Emergency Department Strategic Advisory Panel (QEDSAP) Statewide Intensive Care Clinical Network (SICCN) and Statewide Anaesthesia and Perioperative Care Clinical Network (SWAPNET) endorse the Australian and New Zealand Intensive Care Society (ANZICS) [guidelines](#) regarding the management of COVID-19 associated respiratory failure. Early recognition and referral of patients with worsening respiratory function while on conventional oxygen therapies such as simple face masks or masks with reservoir bags is important to ensure timely and safe escalation of respiratory support. Early optimisation of care and involvement of Intensive Care Unit (ICU) is recommended. The following therapies can be considered in caring for COVID-19 patients.

1. High flow nasal oxygen (HFNO) therapy (in ICU): HFNO is a **recommended** therapy for hypoxia associated with COVID-19 disease, as long as staff are wearing optimal **airborne** PPE. The risk of airborne transmission to staff is low with well fitted newer HFNO systems when optimal PPE and other infection control precautions are being used. Negative pressure rooms are preferable for patients receiving HFNO therapy. **Patients with worsening hypercapnia, acidaemia, respiratory fatigue, haemodynamic instability or those with altered mental status should be considered for early invasive mechanical ventilation if appropriate.**

2. Non-invasive ventilation: Routine use of non-invasive ventilation (NIV) is **not recommended**. Current experience suggests that NIV for COVID-19 hypoxic respiratory failure is associated with a high failure rate, delayed intubation, and possibly increased risk of aerosolization with poor mask fit. Deteriorating patients should be considered for early endotracheal intubation and invasive mechanical ventilation. If NIV is appropriate for an alternate clinical presentation of COVID-19 (e.g. concomitant COPD, APO), this should be provided using similar precautions as for HFNO. Negative pressure single rooms are preferable for patients receiving NIV. For all patients receiving NIV determine a clear plan for treatment failure.

3. Mechanical ventilation: Lung protective mechanical ventilation (MV) is **recommended** for management for acute respiratory failure. Mechanical ventilation should be employed with the use of a low tidal volume strategy (4-8ml/kg predicted body weight) and limiting plateau pressures to less than 30 cmH₂O. Permissive hypercapnia is usually well tolerated and may reduce volutrauma. Higher levels of PEEP (greater than 15 cmH₂O) are **recommended**. Alternate modes of ventilation such as APRV may be considered based on clinician preference and local experience. Viral (rather than HME) filters should be utilised, and circuits should be maintained for as long as allowable (as opposed to routine changes).

4. Neuromuscular blockade (NMB): NMB may be considered in the setting of worsening hypoxia or hypercapnia and in situations where the patient's respiratory drive cannot be managed with sedation alone resulting in ventilator dys-synchrony and lung decruitment.

5. Prone positioning: Current reports suggest prone ventilation is effective in improving hypoxia associated with COVID-19. This should be done in the context of a hospital guideline that includes suitable PPE

for staff, and that minimise the risk of adverse events, e.g. accidental extubation.

6. Fluid management: A restrictive fluid management strategy is **recommended**. The aim is to reduce extravascular lung water. Where possible avoid 'maintenance' intravenous fluids, high volume enteral nutrition, and fluid bolus for hypotension.

7. Liberation from mechanical ventilation: Standard weaning protocols should be followed. HFNO and/or NIV (well fitted facemask with separate inspiratory and expiratory limbs) can be considered as bridging therapy post-extubation but must be provided with strict airborne PPE.

8. Tracheostomy: This represents an aerosolizing procedure and must be considered in clinical decision making. Optimal PPE should be utilised at all times.

9. Suctioning: Closed inline suction catheters are **recommended**. Any disconnection of the patient from the ventilator should be avoided to prevent lung decruitment and aerosolization. If necessary, the endotracheal tube should be **clamped and the ventilator disabled** (to prevent aerosolization).

10. Nebulisation: Use of nebulisers is **not recommended** and use of metered dose inhalers are preferred where possible.

11. Bronchoscopy: Diagnostic bronchoscopy is **not recommended**. It is not necessary for the diagnosis of viral pneumonia and should be avoided to minimise risk of aerosolization. Tracheal aspirate samples for diagnosis of COVID-19 are sufficient and BAL is not usually necessary.

12. Antibiotics: Although a patient may be suspected of having COVID-19, appropriate empirical antibiotics should still be administered within one hour of the identification of sepsis or septic shock. Some patients with COVID-19 infection will present with secondary bacterial lower respiratory infection.

13. Rescue Therapies: *Inhaled nitric oxide and prostacyclin:* There is no evidence for routine use of inhaled nitric oxide, prostacyclin or other selective pulmonary vasodilators in acute respiratory failure. However, during emerging infectious disease outbreaks when resources are exhausted, inhaled nitric oxide and prostacyclin may be considered as a temporising measure when patients develop refractory hypoxemia despite prone ventilation, or in the presence of contraindications to prone ventilation or ECMO.

Recruitment manoeuvres: Although current evidence does not support the routine use of recruitment manoeuvres in non-COVID-19 ARDS, they could be considered in COVID-19 patients on a case by case basis. International experience suggests COVID-19 patients may respond well to these interventions and their application may be appropriate where the patient has not responded to other interventions. They should only be provided by clinicians experienced in undertaking these manoeuvres, dealing with their potential complications and using a closed system.

Extracorporeal life support (ECLS): Early VV-ECMO is **not recommended**. Current reports suggest that COVID-19 patients respond well to the ventilator strategies listed above. Established patient selection criteria for use of VV-ECMO in severe respiratory failure should be applied, with delivery of ECLS in expert centres with sufficient expertise and experience. Discuss with an ECMO specialist early.



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