

Guidance on Respiratory Failure in the Covid-Suspect or Covid-Positive Patients
(With SCCM Guideline Support)

- Most patients will start on nasal cannula and many will not need more than that
- After 6-8 liters per minute of oxygen are needed by nasal cannula, consider moving to high-flow nasal cannula or non-rebreather mask for a trial

Recommendation:

25. For adults with COVID-19 and **acute hypoxemic respiratory failure** despite conventional oxygen therapy, we **suggest using** HFNC over conventional oxygen therapy (weak recommendation, low quality evidence).

- High-flow nasal cannula has been shown to prevent intubation, and in some studies, mortality, compared to regular oxygen therapy; however, there are concerns regarding aerosolization while on that therapy
- Non-rebreather mask has not been shown to improve any outcomes, but has far less risk of aerosolization
- As patients' hypoxemia worsens, choosing high-flow nasal cannula over non-invasive positive pressure ventilation is reasonable
- Immediately intubating every patient who requires >6 liters nasal cannula will overwhelm ICU capacity and may lead to unnecessary intubations. For patients with single-organ failure who are comfortable and requiring moderate amounts of oxygen, attempts to avoid intubation are probably warranted.

Recommendation:

26. In adults with COVID-19 and **acute hypoxemic respiratory failure**, we **suggest using** HFNC over NIPPV (weak recommendation, low quality evidence).

- It is likely that many Covid-19 positive patients may progress to intubation, and early consideration of intubation (especially if diffuse infiltrates/ARDS) is reasonable, both for patient safety and aerosolization concerns

29. In adults with COVID-19 receiving NIPPV or HFNC, we **recommend** close monitoring for worsening of respiratory status, and early intubation in a controlled setting if worsening occurs (best practice statement).

- Intubation should be undertaken by the most experienced airway manager available, using videolaryngoscopy if available

6. For COVID-19 patients requiring **endotracheal intubation**, we **recommend** that endotracheal intubation be performed by the healthcare worker who is most experienced with airway management in order to minimize the number of attempts and risk of transmission (best practice statement).

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- COVID-19 may cause hypoxemia with relatively little respiratory distress. For example, patients may be profoundly hypoxemic yet not be dyspneic – and such patients may “look” fine. Therefore, work of breathing cannot be relied upon to detect patients who are failing HFNC.
- There should probably be a lower threshold to intubate in COVID-19 than in most patients, for the following reasons:
 - Patients can worsen and decline rather abruptly
 - Mask ventilation may increase virus aerosolization. Rapid sequence intubation without bagging is therefore preferred. This will be safer if the patient is starting out with more oxygenation reserve.
 - Intubation requires considerable preparation, so a semi-elective intubation is preferred to crash intubation
- Exactly when to intubate is always a clinical decision. Potential indications would include:
 - Rapidly rising FiO₂ requirements
 - Increasing work of breathing & clinical distress
 - High absolute oxygen requirement (roughly more than FiO₂ of .8 on HHFNC)

Recommendation:

5. For healthcare workers performing **endotracheal intubation** on patients with COVID-19, we **suggest** using video-guided laryngoscopy, over direct laryngoscopy, if available (weak recommendation, low quality evidence).

- Mechanical ventilation should proceed with a high-PEEP, low tidal volume strategy consistent with more traditional ARDS guidelines
- Consider a conservative fluid strategy throughout the course of illness as we know that conservative fluid administration shortens ICU stay and minimizes ventilator days in ARDS

Recommendation:

33. For mechanically ventilated adults with COVID-19 and ARDS, we **suggest** using a conservative fluid strategy over a liberal fluid strategy (weak recommendation, low quality evidence).

- With severe hypoxemia unresponsive to high PEEP and 12-24 hours of invasive ventilation, consider prone positioning daily for more than 12 hours

Recommendation:

34. For mechanically ventilated adults with COVID-19 and **moderate to severe ARDS**, we **suggest** prone ventilation for **12 to 16 hours**, over no prone ventilation (weak recommendation, low quality evidence).

- Prone positioning may be achieved inexpensively with minimal additional equipment purchased and has been shown to decrease mortality in patients with moderate to severe ARDS
- An illustrative video is linked here: https://www.youtube.com/watch?v=E_6jT9R7WJs

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- Nursing procedure in Lippincott's as well:
<https://procedures.lww.com/lnp/view.do?pld=47632&disciplineId=50>
- Patients may benefit from neuromuscular blockade as well:

Recommendations:
35. For mechanically ventilated adults with COVID-19 and **moderate to severe ARDS:**

35.1. We **suggest** using, as needed, intermittent boluses of neuromuscular blocking agents (NMBA), over continuous NMBA infusion, to facilitate protective lung ventilation (weak recommendation, low quality evidence).

35.2. In the event of persistent ventilator dyssynchrony, the need for ongoing deep sedation, prone ventilation, or persistently high plateau pressures, we **suggest** using a continuous NMBA infusion for up to 48 hours (weak recommendation, low quality evidence).

- Recruitment maneuvers may be helpful in the management of these patients, as they have been shown to improve oxygenation

Recommendations:
38. For mechanically ventilated adults with COVID-19 and hypoxemia despite optimizing ventilation, we **suggest** using recruitment maneuvers, over not using recruitment maneuvers (weak recommendation, low quality evidence).

- Descriptions of various recruitment maneuvers are listed here: <https://litfl.com/lung-recruitment-manoevres/>
- A typical recruitment maneuver is to set the patient's PEEP to 30 cm h2O for 30 seconds while watching for signs of hypotension and barotrauma
- If pulmonary vasodilators are considered for refractory hypoxemia, then use of nebulized epoprostenol (where available) is preferred over nitric oxide due to concerns over renal failure

Recommendations:
36. In mechanically ventilated adults with COVID-19 ARDS, we **recommend against** the routine use of inhaled nitric oxide (strong recommendation, low quality evidence).

37. In mechanically ventilated adults with COVID-19, severe ARDS and hypoxemia despite optimizing ventilation and other rescue strategies, we **suggest** a trial of inhaled pulmonary vasodilator as a rescue therapy; if no rapid improvement in oxygenation is observed, the treatment should be tapered off (weak recommendation, very low quality evidence).

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- Use of corticosteroid therapy in Covid-19 had previously been discouraged by the WHO and CDC, but one recently published retrospective trial showed improved radiographic and oxygen demand. Hence the SCCM has offered these recommendations:

Recommendations

41. In mechanically ventilated adults with COVID-19 and respiratory failure (**without ARDS**), we **suggest against** the routine use of systemic corticosteroids (weak recommendation, low quality evidence).
42. In mechanically ventilated adults with COVID-19 **and ARDS**, we suggest using systemic corticosteroids, over not using corticosteroids (weak recommendation, low quality evidence).