

Clinical Practice Guideline: COVID-19 Hypoxic Respiratory Failure & ARDS

Supplemental Oxygen:

1. Oxygenation Goals

- a. Start supplemental oxygen to keep oxygen saturation (SPO₂) greater than 90%.
- b. Keep SPO₂ 90-96%.

2. High Flow Nasal Cannula (HFNC)

- a. Can increase risk of aerosolization of secretions with flows greater than 30L/min.
- b. Can be used selectively for stable patients or those who are DNI. In general, if patient has rapid hypoxemia, we recommend intubation.

3. BiPAP

- a. Can be used in selected cases such as COPD and DNI patients. In general, if patient has rapid hypoxemia, we recommend intubation.
- b. Can increase risk of virus aerosolization. HEPA filters will be used to help mitigate this risk. The patient will also need to be in airborne and droplet precautions.

Indications for Intubation:

1. Rapid respiratory rate, greater than 30 and evidence of fatigue, altered mental status.
2. Hypoxemia with SpO₂ less than 90% on 6L/min supplemental oxygen.
3. In stable patients we recommend transfer to the ICU prior to intubation. Intubation should be done in a negative pressure room with providers wearing appropriate PPE including n95 masks or PAPRs as appropriate.

Initial Ventilator Settings:

1. Assist Control (A/C), Volume Control

- a. Tidal volumes (Tv): We recommend protective lung ventilation based on ARDSnet guidelines.
 - i. 6-8ml/kg of predicted body weight
 1. Women, kg= 50+2.3 (height inches -60)
 2. Men, kg=45.5+2.3 (height inches -60)
- b. Respiratory Rate (RR)
 - i. Start at 20
 - ii. Goal pH greater than 7.3
- c. Positive end expiratory pressure (PEEP)
 - i. Start at least 10, increase as needed to maintain SpO₂ over 90% or PaO₂ greater than 60.
 - ii. Maximum PEEP will be determined by patient factors but will be limited by maintaining a plateau pressure less than 30.
 - iii. If PEEP greater than 14 notify critical care attending for further guidance.
- d. Plateau Pressure (Pplat)
 - i. Goal of 30 or less
 - ii. If greater than 30 decrease Tv by 1ml/kg (minimum of 4ml/kg).
- e. FiO₂ (Oxygen Concentration)
 - i. Start at 1.0 (100% oxygen) and decrease as able to keep SpO₂ 90-96%.

PEEP to FiO₂ Ratio

FiO ₂	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	.5-.8	0.8	0.9	1	1
PEEP	5	8	10	12	14	14	16	16	18	20	22	22	22	24

ARDS Hypoxia:

1. **P/F Ratio (PaO₂ to FiO₂) if PEEP greater than 10**
 - a. Mild ARDS 300-200
 - b. Moderate ARDS 200-100
 - c. Severe ARDS less than 100
2. **If hypoxic despite PEEP optimization consider a trial of full strength Flolan (epoprostenol) inhalation**
 - a. If no improvement in oxygenation, discontinue.
3. **If P/F Ratio 150 or less, consider chemical paralytics**
 - a. Trial intermittent boluses of neuromuscular blocking agents (NMBA).
 - b. If persistent ventilator dysynchrony or need for deeper sedation, use continuous infusion of NMBA.
 - i. Use NMBA order set.
4. **If P/F Ratio less than 100, manually prone patient**
 - a. Proning will be done for 23 hours follow by 1 hour of supine for cares. Each cycle will increase supine time by one hour as patient tolerates.

Other ARDS Treatments:

1. **Volume Restrictive Strategy**
 - a. Maintain patient volume neutral.
 - b. Consider daily Lasix if able to tolerate.
2. **Prophylactic Antibiotics**
 - a. 10-20% of COVID-19 ARDS patient develop bacterial super infections.
 - b. Recommend using the community acquired pneumonia order set to assist with selecting antibiotics.
 - b. Recommend broad spectrum antibiotics on admission to the ICU.
 - i. De-escalate in 48-72 hours as able based on cultures.
3. **Corticosteroid Use**
 - a. No clear evidence in COVID-19 patients.
 - b. Consider for use in select patients.
4. **Novel COVID-19 Pharmaceutical Treatments**
 - a. Currently no proven treatments, many are in experimental trials with results pending.
 - b. Please refer to the North intranet for updates.