



Critical Care COVID-19 Protocol



PRESENTATION

- Any or all of fever, cough, myalgia, dyspnea, diarrhea, and/or worsening acute hypoxic respiratory failure of unclear etiology
- WBC can be high, low, or normal, frequently with lymphopenia
- May see elevated CRP, Ferritin, LDH, CPK and/or troponin but currently these do not add to diagnostic or management
- Chest imaging findings not sensitive nor specific for COVID-19 and can include an alveolar filling process, typically bilateral and peripheral in lower lobes, with ground glass opacities, with or without consolidations

DIAGNOSTIC WORK-UP

- COVID-19 PCR should be sent immediately and follow [Lifespan Algorithm to Assess for COVID](#) to maintain appropriate precautions. ID consult NOT required to send test.
- D-dimer for possible anticoagulation
- Co-infections possible, consider **Respiratory Pathogen Panel**
- ARDS – defined per Berlin Criteria to be acute (<1 week onset), bilateral opacities on chest imaging, ABG with P/F ratio < 300 mm Hg with minimum 5 PEEP, and must not be fully explained by cardiac failure or volume overload

INITIAL RESPIRATORY MANAGEMENT

Full [Airway Management Algorithm](#)

- Low threshold to consider intubation when acutely worsening (increasing FIO₂ requirements, clinical deterioration, inability to maintain pulse ox at goal 92-96%)
- High flow nasal cannula (HFNC) can be used as first-line step-up therapy up to 60 L/min, however consider intubation early if rapidly rising requirements and/or clinical worsening**
- Non-invasive positive pressure ventilation (NIPPV), such as BiPAP/CPAP, can be used short-term if there is a tight face seal and in-line filters available (N95 mask with face-shield if filter used on NIPPV device)
- When requiring intubation, it should be performed with CAPR and by anesthesiology using RSI. If emergent, the next most skilled provider should intubate

RESPIRATORY FAILURE MANAGEMENT

LUNG PROTECTIVE VENTILATION

- Two clinical phenotypes emerging** – In order to differentiate, first trial High PEEP strategy (14-18) initially per usual [ARDSNet](#). If no improvement in oxygen and/or worsening hemodynamics, then trial low PEEP (5-8) with same ox sat and TV goals and tolerate higher FiO₂ than usual
- Goal tidal volume 6 ml/kg [ideal body weight](#) (Low Tidal Volume Ventilation)
- Target SaO₂ of 92-96%, PaO₂ > 60mmHg
- Plateau Pressure < 30 and Driving pressure (Pplat-PEEP) < 15
- Beware of possible lung injury related to: increased work of spontaneous breathing, tachypnea, or large tidal volumes despite low pressure settings
- Consider deeper sedation goals in these patients, many appear to need multiple Rx
- Hypercarbia common especially late in course, titrate respiratory rate to tolerate pH 7-7.15 to maintain low tidal volumes

CONSERVATIVE FLUID STRATEGY

- Avoid maintenance fluids, LR bolus if needed for resuscitation
- Diuresis as hemodynamics and creatinine tolerate

PARALYTICS

- Trial of bolus NMBA favored, but continuous NMBA recommended if significant vent dysynchrony, proning, high plateau pressures, or requiring continuous deep sedation

PRONE POSITIONING

- Suggested for moderate to severe ARDS with hypoxemia, for a trial of 12-16 hours

If worsening

If improving

ECLS Consult

When failing above therapies, at discretion of MICU attending

Ventilator Liberation

When passing SAT/SBT and can extubate to ~6 L NC (i.e. PSV 5/5 with FiO₂ ≤ 25%)

OTHER MANAGEMENT CONSIDERATIONS

- Many patients on ventilators appear to wean very slowly, often over weeks
- Shock – Goal MAP >65mmHg, first-line vasopressor is norepinephrine
 - If worsening or refractory shock, consider cardiogenic shock with POCUS, troponins, ECG, and ScvO₂, but formal TTE if high concern for this after discussion with cardiology.
- Anticoagulation – For patients with D-dimer >1000, elevation of D-dimer from baseline, and evidence of clotting (such as central line clot), start therapeutic anticoagulation. All patients require DVT prophylaxis. Please refer to [COVID-19 Anticoagulation Protocol](#)
- Antibiotics – Empiric, broad spectrum antibiotics are recommended once patient requires mechanical ventilation
- Steroids – dexamethasone 6 mg IV/PO daily is recommended for patients on mechanical ventilation or supplemental oxygen, for up to 10 days**
- Hemoglobin Transfusion goal of 6 to 6.5, depending on comorbidities

INVESTIGATIVE MEDICATIONS

- Remdesivir – recommended for patients with severe disease (supplemental oxygen use, including mechanical ventilation) per [FDA emergency use](#)**
- Hydroxychloroquine – **not recommended**
- Statins, NSAIDs, lopinavir/ritonavir, and immunomodulatory medications are currently not recommended

DIFFERENCES FROM USUAL CARE

- Minimize staff in room, bundle bedside procedures
- Appropriate guideline-based isolation and CAPRs for aerosol generating procedures, including bronchoscopy, intubation, and extubation (Do not extubate to aerosol mask). Avoid bronchoscopy.
- Minimize use of nebulizers, prefer MDIs
- Minimize excessive testing, no role for daily CXRs
- Avoid travel when possible. Use surgical mask on patient if < 6 L. If requiring >6 L NC, then patient should travel on NIPPV with filter

HELPFUL LINKS

- [Lifespan COVID-19 Provider Information](#)
- [Airway Management Algorithm](#)
- [Lifespan Algorithm to Assess for COVID](#)
- [ARDSnet Protocol](#)
- [Surviving Sepsis Campaign COVID-19 Guidelines](#)
 - [Oxygenation](#)
 - [Therapeutic Management](#)