



Critical Care COVID-19 Protocol



Lifespan

PRESENTATION

Symptoms

- Any or all of fever, cough, myalgia, dyspnea, diarrhea, and/or worsening acute hypoxic respiratory failure of unclear etiology

Common Signs

- WBC can be high, low, or normal, frequently with lymphopenia
- May see elevated CRP, D-dimer, Ferritin, LDH, CPK and/or troponin but currently these do not add to diagnostic or management strategy
- Chest imaging with alveolar filling process, typically bilateral and peripheral in lower lobes, with ground glass opacities, with or without consolidations and septal thickening. Findings not sensitive, nor specific for COVID-19

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. Negative tests should not be repeated currently
- Co-infections possible, Respiratory Pathogen Panel (RPP) required
- 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

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, however low threshold to intubate once requiring >15 L/min
- 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 faceshield 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

- Target SaO2 of 92-96%, PaO2 > 60mmHg
- Goal tidal volume 6 ml/kg [ideal body weight](#)
 - Plateau Pressure < 30
 - Driving pressure (Pplat-PEEP) < 15
- [ARDSnet](#) High PEEP strategy, monitor for barotrauma



CONSERVATIVE FLUID STRATEGY

- Avoid maintenance fluids, LR bolus if needed for fluid resuscitation
 - Diuresis as hemodynamics and creatinine tolerate
- Hgb transfusion goal of 6 to 6.5, depending on comorbidities



PARALYTICS

- Trial of bolus NMBA favored, but continuous NMBA recommended only if significant vent dyssynchrony, proning, high plateau pressures, or need for continuous deep sedation



PRONE POSITIONING

- Suggested for moderate to severe ARDS with hypoxemia, for a trial of 12-16 hours (use prone mask if available)



INHALED THERAPIES

- Consider trial of inhaled epoprostenol if not meeting oxygenation goals, wean off if ineffective. Do not trial inhaled nitric oxide

If worsening

If improving

ECLS Consult

When failing above therapies, at discretion of MICU attending

Ventilator Liberation

When passing SAT/SBT and can be extubated to ≤ 6 LPM NC

OTHER MANAGEMENT CONSIDERATIONS

- Shock – Goal MAP >65mmHg, first-line vasopressor is norepinephrine
 - If worsening or refractory shock, consider cardiogenic shock (risk of viral myocarditis) with POCUS, troponins, ECG, and ScvO2, but formal TTE if high concern for this after discussion with cardiology
- Antibiotics – Empiric, broad spectrum antibiotics are recommended once patient requires mechanical ventilation
- Steroids – Only consider in mechanically intubated patients who meet criteria for ARDS, not recommended in non-ARDS patients or in cases of septic shock

INVESTIGATIVE MEDICATIONS

- Remdesivir – Enrolling in trial for non-intubated patients in ICU with clinical worsening, recommend early ID consult for aid in enrollment prior to intubation. Order daily LFTs and INR if on this.
- Hydroxychloroquine – Evolving guidelines, currently we do **not** recommend starting this medication unless as rescue therapy in intubated patient with worsening ARDS as determined by clinical team. If already receiving on transfer to ICU, would continue.
- 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 in general.
- 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](#)