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

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

Note: this document was created by the Division of Pulmonary, Critical Care, and Sleep Medicine at Brown University and may be modified or updated as the COVID-19 situation evolves. Last update 4/16/20 – Version 2