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# MGH Treatment Guide for Critically Ill Patients with COVID-19

## Presentation
### Notable SX
- ~65-80% Cough
- ~45% Febrile initially
- ~15% URI Sx
- ~10% GI Sx
- Acute worsening after early mild sx

### High Risk for Severe DZ
- Age >55
- Comorbid diseases:
  - Pulm, cardiac, renal
  - Diabetes, HTN
  - Immunocompromise

### Labs Indicating Severe DZ
- D-dimer >1000
- CPK > 2x ULN
- CRP > 100, LDH > 245
- Troponin elevated/uptrending
- Abs lymphocyte count < 0.8
- Ferritin > 300

## Diagnostics
### Daily Labs
- CBC with diff (trend lymphocyte ct)
- CMP
- CPK

### Risk Strat Q2-3 Day PRN
- D-dimer
- Ferritin/CRP/ESR
- LDH
- Troponin, EKG

### One Time Test for All Pts
- HBV, HCV, HIV testing
- Influenza A/B, RSV
- Additional resp viral per ID guide
- COVID-19 (if not already performed)

## Respiratory Failure
### Consider Early Intubation
**Avoid using HFNC or NIPPV**

#### Warning signs: Inc FiO2, Dec SaO2, CXR worse

### Lung Protective Ventilation
- Vt 4-6 ml/kg predicted body weight
- Plateau pressure < 30
- Driving pressure (Pplat-PEEP) < 15
- Target SaO2 90-95%, PaO2 > 60
- Starting PEEP 8-10 cmH2O

### Conservative Fluid Strategy
No maintenance fluids, diuresis as tolerated by hemodynamics/Creatinine

### PEEP Titrataion
Best PEEP by tidal compliance or ARDSnet low PEEP table

### PRONE
Early consideration if cont. hypoxemia or elevated airway pressures

### Additional Therapies
- Paralytics for vent dysynchrony, not routine
- Inhaled NO: up to 80 ppm (no epoprostenol)

### IF Worsening
- ECMO consult if continued hypoxemia or elevated airway pressures

### IF Improving
- Vent Liberation
  - Daily SAT/SBT when appropriate
  - ABCDE bundle

## Hemodynamics
- MAP > 65
- Norepinephrine first choice pressor
- IF worsening:
  - Consider myocarditis/cardiogenic shock
  - Obtain POCUS echo, EKG, trop, CVO2 (formal TTE if high concern)

## Change to Usual Care
- Minimize staff contact in room
- No routine daily CXR
- High threshold for bronchoscopy
- High threshold to travel
- Bundle bedside procedures
- Appropriate guideline-based isolation for aerosol generating procedures:
  - Bronchoscopy
  - Intubation/Extubation
  - Avoid nebs, prefer MDIs

## Therapeutics
### All ICU Admissions:
- Low threshold for empiric abx
- Tracheal aspirate for intubated pts

### With ID Guidance:
- Consider hydroxychloroquine and statin
- Remdesivir through clinical trial

### Immune Modulation
- Immunomodulatory therapies only in consultation with ID and critical care attending
- No steroids for resp failure, consider only in s/o additional indication

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A living document by Division of Pulmonary and Critical Care in collaboration with the Dept. of Anesthesia, Critical Care, and Pain Medicine and Respiratory Care. May be updated or modified as situation evolves. Version created 3/19/20