2020 COVID-19 ICU Guidelines Summary

Infection Control

For all MSCPU or ICU patients with suspected or known COVID-19 AND for performing aerosol generating procedures on any suspected or known COVID-19 patient

- All providers should use all of the following:
- Fitted respiratory masks (N95, half mask respirator or PAPR)
- Gown, gloves, eye protection (face shield or safety goggles)
- Negative pressure room if available with the door kept closed

Performing Endotracheal Intubation

- Extremely high risk for aerosolization, perform preferentially in negative pressure room as possible
- Recommend utilizing RSI and paralysis in all patients
- Suggest video-guided over direct laryngoscopy, if available
- Recommended to be performed by individual most experienced with airway management

Evaluation and Testing

For Critically Ill or Intubated Adults with suspicion of COVID-19

- Upper respiratory tract sample from nasopharyngeal swab is the primary preferred method of testing for all patients
- Lower respiratory tract (induced sputum, tracheal aspirate or bronchoalveolar lavage) is preferred secondary method for those with initial indeterminant or inconclusive NP result or high index of suspicion after initial negative NP result
- Recommend against bronchoscopy due to aerosolization risk

Laboratory Evaluation

- Initial testing: CBC, CMP, PT/INR/PTT, β-HCG for women of childbearing age, blood, urine and respiratory cultures including RVP, strep and legionella antigens, ABG for hypoxia requiring >4-6L O2
- Consider baseline procalcitonin, troponin, D-Dimer, CRP, and LDH for prognostication; baseline EKG for QTc monitoring; consider CPK, BNP and ferritin if clinically indicated
- Daily labs: CBC, BMP, LFTs as indicated; Consider ABG, PT/INR/PTT, D-dimer, CPK and troponin if clinically indicated or will change clinical management. Utility of many serial labs at this time remains unclear

Imaging

- Initial testing: portable chest x-ray; chest CT should NOT be routinely obtained; daily CXRs avoided when possible
- Consider POCUS for pulmonary and cardiac evaluations

Supportive Care

Fluids

- Conservative fluid strategy recommended over liberal fluid strategy
- Suggest goal net even to negative if no signs of hypoperfusion
- Recommend crystalloids over colloids, with preference to balanced crystalloids over unbalanced crystalloids.

Vasopressors

- Suggest targeting MAP of 60-65mmHg rather than higher MAP
- Recommend norepinephrine as a first-line vasoactive agent and vasopressin as second-line agent
- For those with shock + cardiac dysfunction + persistent hypoperfusion despite fluid resuscitation and norepinephrine:
  - Dobutamine may be beneficial for inotropic support in those with cardiogenic shock

Corticosteroids

- Routine use not recommend for primary COVID treatment
- Consider for treatment of vasopressor refractory shock, COPD/asthma exacerbations, history of steroid use with shock, and pregnancy 24-34 weeks (selected cases)

Respiratory Support

- Suggest starting supplemental O_2 if SaO_2 < 90% and maintain 92-96%
- Suggest oxymask as initial delivery device; if high-flow nasal cannula (HFNC) is required, patient should wear a surgical mask
- Heated high-flow nasal cannula (HHFNC) should be used cautiously
- Recommend against NIPPV due to aerosolization and high risk of treatment failure; consider only in those patients with alternative diagnosis, eg., COPD or HF exacerbation, management of OSA/OHS
- Patients on HHFNC or NIPPV should be in a negative pressure room and on an ICU service
- Recommend early intubation for COVID-related ARDS due to high risk of treatment failure with HFNC, HHFNC and NIPPV (if utilized)

Mechanical Ventilation

- Recommend ARDSnet ventilation strategies with high PEEP ladder
- Recommend low tidal volume ventilation (range 4-8mL/kg ideal body weight, recommend starting at 6ml/kg IBW)
- Recommend targeting plateau pressures (Pplat) of < 30 cm H_2O
- Goal SaO2 88-95% (or PaO2 55-80mmHg)
- For those with moderate-severe ARDS:
  - Suggest using a higher PEEP (> 10 cm H_2O)
  - Suggest prone ventilation for PaO2/FiO2 <120 after 6-12 hrs on ventilator; suggest proning for at least 16 hours per day; unprone if PaO2/FiO 4 hours after supination is ≥ 150
  - If persistent ventilator dyssynchrony, severe ARDS (P/F <150), need for ongoing deep sedation, unable to achieve target Vt, consider intermittent neuromuscular blockade (NMB) followed by continuous NMB if unable to achieve goals with intermittent dosing
  - Recommend recruitment maneuvers in those with hypoxemia despite optimized ventilation
  - Pulmonary vasodilator (epoprostenol preferred over NO) should be considered a rescue therapy in those with 1) severe ARDS and refractory hypoxemia despite optimized ventilator, prone positioning and paralysis or 2) right heart failure; wean off vasodilator if no clinical improvement
- Refractory hypoxemia: consider VV ECMO although utility is unclear

COVID-19 Specific Therapy

Antivirals

- Consider antivirals in confirmed patients with any of the following high-risk features: age ≥65, history of lung and/or heart disease, history of solid organ or hematologic transplant, immunocompromising condition or medications, moderate to severe infection (requiring supplemental oxygen or mechanical ventilation) and worsening clinical status
- ID consult mandatory if initiating therapy (Central Region)
- See ID Treatment Algorithms for full details (available on UCH Source)
- **Recommend enrollment in appropriate clinical trials rather than empiric therapies when possible**
  - Current clinical trials treatment options include: remdesivir, hydroxychloroquine and sarilumab

Antimicrobials

- Consider antimicrobials if concerned for secondary bacterial pneumonia
  - CAP coverage: ceftriaxone + doxycycline (avoid QTc prolongation from macrolides and quinolones if using antivirals)
  - MDRO and/or MRSA risk factors: cefepime/ceftazidine + linezolid
- Daily assessment for de-escalation based on cultures and clinical status (including repeat procalcitonin at 48-hours)

Cytokine Storm Syndrome

- Consider use of tocilizumab or sarilimumab (on clinical trial at Anschutz only) with ID consult if high clinical suspicion

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