Pharmacologic Adjuncts for Critical Illness in Suspected COVID-19
Harborview Medical Center: EM COVID-19 Critical Illness Working Group
March 12, 2020

Purpose:
Refresher education on therapeutic alternatives to nebulized and other medications for COVID-19 patients in the emergency department

Background:
With both proven and suspected increased risk of transmission with the use of aerosolized medications there may be clinical and safety benefit for use of alternative medications and strategies.

Minimization of staff exposure is necessary. Invasive procedures such as central linea should be deferred if clinically appropriate.

Respiratory Recommendations:

Supplemental Oxygen
- Nasal cannula should be administered to all patients presenting with hypoxemia and titrated to the specific patient’s goal oxygen saturation based on co-morbid conditions.
- High-flow oxygen (>15 L/min) should be avoided and early intubation considered

Beta₂ Agonists
- Beta₂ Agonists should be administered to patients with significant bronchospasm or airflow obstruction. Addition of a spacer will help minimize decreased efficacy due to poor inhaler technique. We recommend the use of an albuterol MDI for patients who fulfill ALL of the following criteria: BRONCHOSPASM + HIGH INDEX OF SUSPICION FOR VIRAL ILLNESS
  - Albuterol HFA
    - Dose: 2-8 puffs q20 minutes x3 doses

Muscarinic Antagonists
- The addition of ipratropium to albuterol has been demonstrated to decrease hospitalizations in severe asthma attacks and improve symptomatic control in COPD patients. In Kirkland et al, it was found that combination therapy was more likely to result in adverse events such as tremor, agitation and palpations. Although the overall quality of evidence is poor, combination therapy may be reasonable when patients have poor response to beta agonists.
- For the purposes of this document, the only time we would recommend treatment with an Ipratropium MDI, would be for patients who fulfill ALL of the following criteria: COPD + BRONCHOSPASM + HIGH INDEX OF SUSPICION FOR VIRAL ILLNESS
  - Ipratropium (limited supply)
    - Dose: 8 puffs (136 mcg) q20 minutes up to 3 hours

Corticosteroids
Corticosteroids should be avoided in cases with a high index of suspicion for COVID-19 at this time. This is based on CDC and WHO recommendations due to evidence of prolonged viral replication in cases of MERS-CoV secondary to corticosteroid administration. **Steroid administration is not recommended** unless clinically indicated for reasons such as refractory septic shock or COPD exacerbation.

**Antibiotics**

- **Consider antibiotics for superimposed bacterial pneumonia.** Community acquired pneumonia (e.g., ceftriaxone and azithromycin) versus hospital acquired pneumonia coverage should be determined based individual patient risk factors.

**Antivirals**

- A number of antiviral therapies (e.g., remdesivir, interferon, lopinavir/ritonavir) may be useful in COVID-19. These must be discussed with Infectious Diseases, and can generally be deferred until admission.

**Vasopressors**

- With the goal of minimizing the risk to healthcare providers invasive procedures including central lines should be avoided at the discretion of the provider.
- There is some contradiction in the literature regarding safety of peripheral pressor with more recent studies suggesting safety.
- Therefore, **peripheral or intraosseous (IO) vasopressors should be considered in COVID-19 patients.**
  - Infuse via forearm or antecubital fossa peripheral IV, 20 gauge or larger
  - Avoid deep or hand IVs
  - Ensure IO is well-seated in bone
  - Monitor for extravasation and treat per protocol

**Refractory Hypoxemia**

- Refer to HMC Hypoxemia Guideline for additional pharmacologic adjuncts for refractory hypoxemia