Guidelines for delivery of inhaled medications to patients with confirmed or suspected COVID-19 infections

Background/Rationale:

1) Use of nebulizers for aerosol delivery of medications has been associated with increased risk of spreading airborne diseases. The Centers for Disease Control (CDC) recognize the risk to caregivers who are present in the room for procedures that generate aerosols. During past pandemic airborne illnesses, the CDC and the American Association for Respiratory Care (AARC) have suggested limiting nebulized medication to patients with these illnesses, such as H1N1 influenza. The use of N95 respirator masks are recommended for individuals performing aerosolizing therapies for patients with suspected or confirmed novel virus infection. Oral secretions from the infected patient frequently “back-flow” into the nebulizer unit and are aerosolized. The resulting large particles carry viral fomites.

2) Multiple investigations have demonstrated equal efficacy of bronchodilators via metered dose inhalers (MDI) using valved holding chambers (VHC) in comparison to nebulized bronchodilators in both pediatric and adult patients. MDI/VHC use has been associated with lower side effects and more rapid improvement in lung function in some studies. A dose of 4 puffs of albuterol HFA (108mcg/puff) is equipotent to 2.5mg nebulized albuterol. The recommended dosage by the National Heart Lung and Blood Institute, National Asthma Education and Prevention Program Expert Panel Report (EPR-3) for asthma exacerbations is 4 – 8 puffs per treatment, although many researchers recommend up to 12 puffs.

Given these indications, and in light of the heightened risk, below are the recommendations for patients with suspected or confirmed COVID-19 infection.

Recommendations:

1) Patients receiving the inhaled medications listed below (in the dosages section) should receive treatments by MDI/VHC instead of aerosolized medication.

2) Recommended Dosages of Medications delivered by MDI*:
   a. Albuterol: 4 – 8 puffs (equivalent to 2.5 – 5 mg nebulizer solution)
   b. To deliver MDI/VHC Albuterol in place of continuous nebulized Albuterol:
      i. 5mg nebulized solution = 8 puffs total over 1 hour (4 puffs per 30 minutes)
      ii. 10mg nebulized solution = 16 puffs total over 1 hour (8 puffs per 30 minutes)
      iii. 15mg nebulized solution = 24 puffs total over 1 hour (8 puffs per every 20 minutes)
   c. Ipratropium: 4 – 8 puffs (equivalent to 0.25 -0.5 mg nebulizer solution)
*Refer to MDI-VHC dosage algorithm for details.

3) Other medications, such as nebulized antibiotics or alpha dornase (Pulmozyme), that do not have MDI substitutions are not affected by this recommendation. However, the need for these medications should be re-evaluated frequently so that the aerosolized medication can be discontinued as soon as it is no longer needed.

References:


4 Salyer J, et al. The conversion to metered-dose inhaler with valved holding chamber to administer inhaled albuterol: a pediatric hospital experience. Respiratory Care 2008; 53: 338-345