

Care Recommendations for Patients Using Positive Airway Pressure (PAP) Devices with Known or Suspected Respiratory Viral Infection with COVID-19 ^{1,2,3}

PAP devices for the treatment sleep related breathing disorders (e.g. sleep apnea) can increase risk of dispersion of droplets with viral particles into the environment. This risk is especially of concern with poor fitting mask interfaces and high leak.

1) Considerations to limit viral particle spread

- a. Use a well-fitted non-vented full-face mask (covering nose and mouth).
- b. Add a combined bacterial/viral (hepa) filter between the mask and device tubing to reduce particle spread (add swivel CO₂ exhalation port on tubing and switch to non-vented mask).
 - i. *Device humidifier needs to be off.*
 - ii. For ResMed device, turn AB filter to “on” in settings.
 - iii. For Philips device, filter setting is not available.
- c. You will need to discuss with your DME provider for set up of above options.

2) Care for disposables for PAP devices:

- a. Mask interface– The leak from the mask is a significant source of infection. Clean daily with a cleaning wipe. (Mask cushions made from foam cannot be exposed to water and should not be used when sick.) The wipes can easily be made at home:

To Make Disposable Cleaning Wipes, You Will Need:

- 1 sealable container large enough to fit a roll of paper-towels cut in half
- 1 roll of the THICK paper towels. (Take the center tube out.)
- 2 cups of water, boiled and cooled
- 2 tablespoons concentrated dish soap
- 2 tablespoon white vinegar

Put towels in container and saturate with the solution. Keep container sealed.

- b. Hose – clean the hose with sterilizing solution every other day. This could be done with commercial solutions (such as Control III Disinfectant - <http://www.controlthree.com/>). You can also use a 50% hydrogen peroxide solution.
- c. Humidity chamber (if not using option #1 above) – Place fresh water into the chamber daily (distilled/bottled or boiled). Clean the chamber and the hose every other day.
- d. Also see ResMed and Philips cleaning guides:
 - a. <https://www.resmed.com/en-us/sleep-apnea/cpap-parts-support/cleaning-cpap-equipment/>
 - b. <https://www.usa.philips.com/c-e/hs/better-sleep-breathing-blog/better-sleep/keeping-it-clean-cpap.html>
- e. Filters –
 - Consider adding an additional in-line combined bacterial/viral filter. See #1. (You will need to discuss with your DME provider if this is an option). Change the filter every 72 hours while sick.
 - The standard device filter should also be changed once a week while you are sick.

3) What your family and caregivers need to know:

- a. Space needed for isolation – PAP devices are known to spread infectious particles, especially with poorly fitted masks. Assuming the most conservative plan a space of one yard (3 feet).
 - b. What family/caregivers need to do to keep themselves safe –
 - Gloves - when the family/caregiver is in the room of a patient, they should wear gloves - and change gloves each time.
 - Masks – when in the patient’s room – the family/caregiver should wear a mask and eye goggle for protection, leave equipment in one location right outside of room, and dispose daily.
 - Family/caregiver should use protective gown/clothing when in room, same protocol as above.
 - Family/caregivers should clean surfaces with commonly available anti-bacterial/viral spray.
- 4) **Emergency department or hospital pulmonary care for suspected/infected patient**
- a. To decrease spread of COVID19 in the hospital, use of home PAP/noninvasive ventilation will likely not be allowed.
 - b. Severe pneumonia may necessitate intubation and ventilator support.
 - c. Also see American College of Chest Physicians (ACCP) COVID 19 website for recommendations on respiratory care of home-based ventilation patients who are suspected of or infected with COVID 19.
<https://www.chestnet.org/Guidelines-and-Resources/Resources/CHEST-Novel-Coronavirus-Resources>

<https://foundation.chestnet.org/patient-education-resources/>

References:

1. Hui DS, Chow BK, Lo T, et al. Exhaled air dispersion during high flow nasal cannula therapy versus CPAP via different masks. Eur Respir J 2019; 53.
2. Kotoda M, Hishiyama S, Mitsui K, et al. Assessment of the potential for pathogen dispersal during high-flow nasal therapy. J Hosp Infection. 2019, In press.
3. Simonds AK, Hanak A, Chatwin M, et al. Evaluation of droplet dispersion during non-invasive ventilation, oxygen therapy, nebuliser treatment and chest physiotherapy in clinical practice: implications for management of pandemic influenza and other airborne infections. Health Technol Assess. 2010;14(46): 131-172.
4. Esquinas AM, Pravinkumar E, Scala R, et al. Noninvasive mechanical ventilation in high risk pulmonary infections: a clinical review. Eur Respir Rev. 2014;23(134):427-38.

Author Affiliations

¹Michelle Cao, DO, FCCP

Pulmonary, Critical Care, Sleep Medicine

Division of Neuromuscular Medicine & Division of Sleep Medicine, Stanford University

²Sherril Katz, MD, FCCP

Pediatric Pulmonology and Sleep Medicine

Division of Pediatric Respiratory, Department of Pediatrics, University of Ottawa

³Lisa Wolfe, MD, FCCP

Pulmonary, Critical Care, Sleep Medicine

Division of Pulmonary and Critical Care, Department of Medicine, Northwestern University