

**Respiratory Therapy Services**  
**Novel Coronavirus 2019 (COVID-19) Recommendations**

\*All information is subject to change, as needed\*

**Bronchial Hygiene:**

- Avoid all unnecessary bronchial hygiene therapy<sup>4</sup>
  - Avoid: PEP therapy, EZPAP therapy, and Metaneb
  - Consider bed percussion / vibration, if necessary
  - Consider chest vest therapy, if necessary

**Aerosol Therapy:**

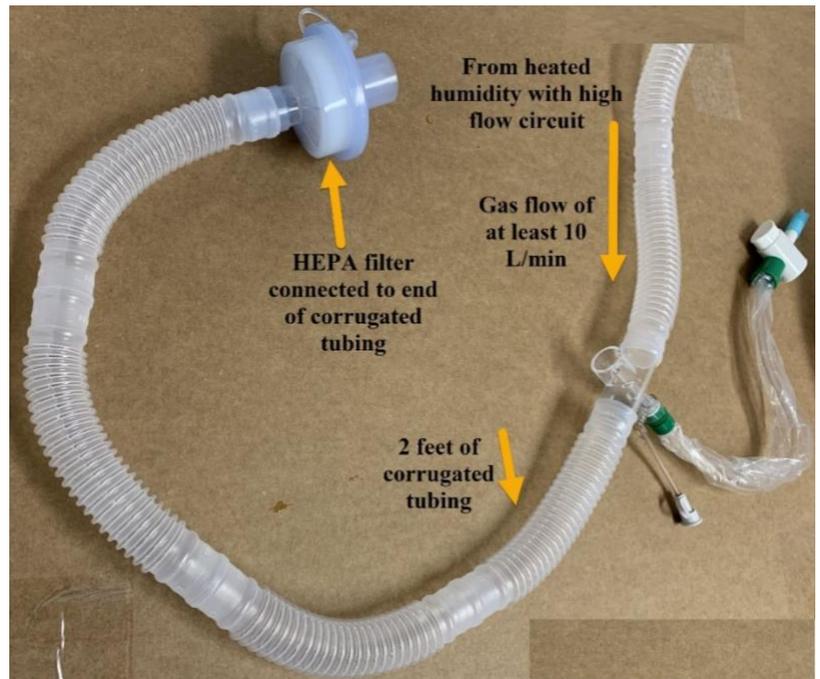
- Avoid all aerosol generating therapies, if possible<sup>4</sup>
- Use MDIs and DPIs when possible
- Use a vibrating mesh (Aerogen) nebulizer for ventilated and HFNC patients<sup>4</sup>
- If using a jet nebulizer attach an expiratory filter and one way valves as seen in the picture



Filtered Aerosol Set-up

## Oxygen Therapy:

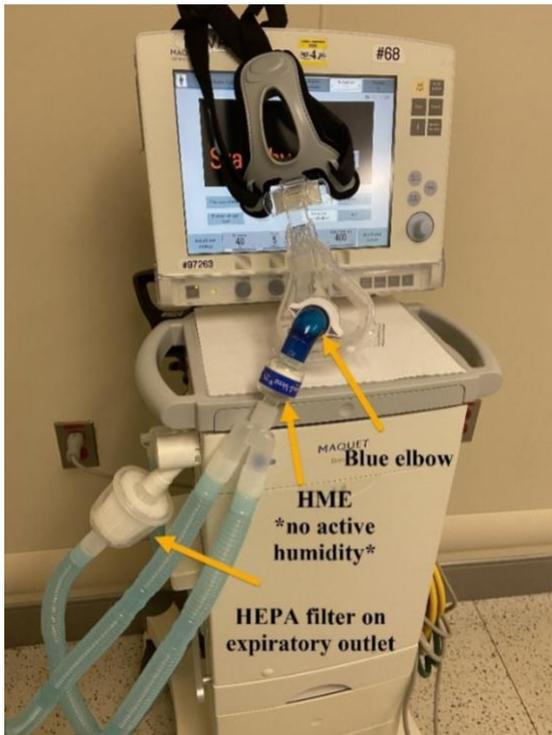
- For tracheostomy tube patients use a T-piece setup with a HEPA filter on the expiratory side
  - Use heated humidity with the high flow stand
  - Use an inline suction adapter
  - Connect 2 feet of expiratory corrugated tubing to the T-Piece with a HEPA filter. Be sure to point exhaled gas away from staff and not to cover the outlet of the filter.



Tracheostomy T-Piece Set-up

## Noninvasive Ventilation (NIV):

- The use of CPAP/BIPAP is not recommended<sup>1,2,3,4</sup>
- If unavoidable, use a dual limb circuit with HEPA filters (Servo I, G5, Flight 60, & Astral)
  - Avoid using a single limb circuit NIV device (V60)
- If unavoidable, NIV should never be used outside of a negative pressure room<sup>3,4</sup>
- Use an HME, not active humidity, to minimize spray of condensate

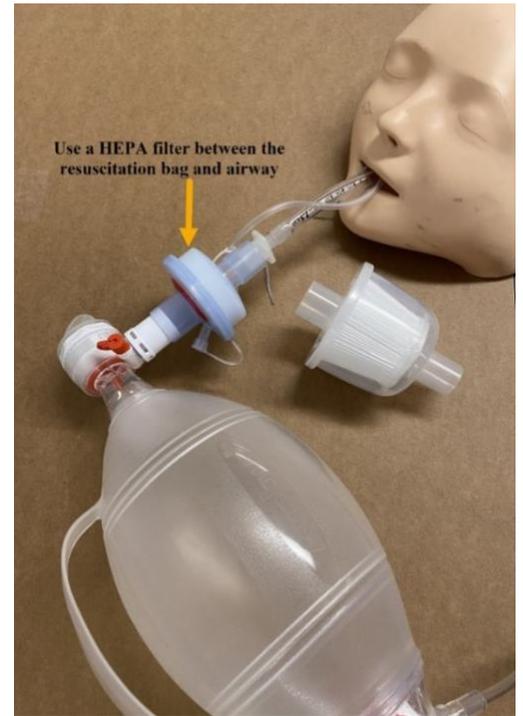


## Intubation:

- Intubation should take place in a negative pressure room<sup>4</sup>
- Use a HEPA filter anytime a resuscitation bag is used. This includes the self-inflating and flow-inflating resuscitation bag.

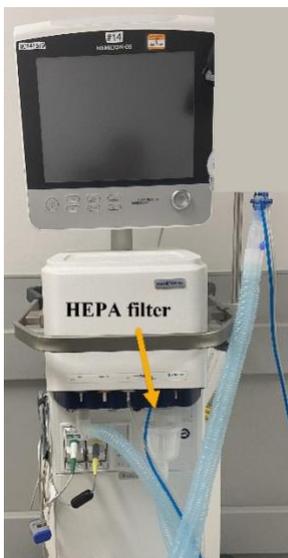


Example of Resuscitation Bag Connected to a HEPA Filter and both HEPA Filters are available



## Mechanical Ventilation:

- Consider early mechanical ventilation
- Use a dual limb circuit<sup>4</sup>
- Use a HEPA filter on the expiratory limb (DuoGuard preferred)
- Use HMEs instead of heated humidity<sup>4</sup>
- Use in-line suction catheters<sup>4</sup>
- Avoid breaking the circuit; only change HME & Filters if visibly soiled<sup>4</sup>
- Cover open circuits with a barrier
- Recommend ARDSnet strategies<sup>3</sup>
- Recommend targeting high PEEP
- Recommend Prone Positioning for severe ARDS (P/F ratio <150)



**\*DuoGuard Preferred for ventilators**

## **Bronchoscopy:**

- Avoid bronchoscopy
- If necessary, use a disposable fiber optic bronchoscope

## **Transportation of Ventilated Patient**

- Confirm all connections are secure
- Consider shielding connections that are at risk

## **Reasoning for Recommendations**

**Novel coronavirus** (COVID-19) is associated with a high risk to medical professionals for contracting the virus.<sup>3,4</sup> At this time over 1,700 bedside clinicians in China have been infected by COVID-19 while caring for patients.<sup>4</sup> Respiratory therapy treatments are considered high risk for nosocomial transmission<sup>4</sup>. These recommendations reduce the risk of exposure of bedside clinicians. Most recommendations are from expert opinion based upon experience reported with COVID-19 and SARS-CoV.<sup>3,4</sup>

**Aerosol generating** procedures should be avoided to prevent the generation of infectious aerosols. Procedures that increase the likelihood of coughing and close contact should be avoided such as unnecessary bronchial hygiene or nebulizer therapy. If necessary, the therapy should be delivered in a negative pressure room. The use of a vibrating mesh nebulizer is recommended over a jet nebulizer. A nebulizer with a filter and one way valves is recommended to decrease the risk of exposure to the clinician. If a patient has a **tracheostomy tube** use of a T-piece should be the primary system if an HME is not available. This will allow for inline suctioning and also for the use of a filter on the exhalation side.

**Supplemental oxygen** can be provided with usual delivery devices.<sup>2</sup> The use of humidified oxygen should be avoided to prevent possible viral spread from aerosol generation.<sup>2</sup> Oxygen delivery over 6 L/m may increase the risk of viral spread.<sup>4</sup> HFNC may increase the risk of viral spread through aerosol generation.<sup>2</sup>

**Noninvasive ventilation** is not recommended for multiple reasons. Case reports of SARS-CoV reported considerable transmission risk over extended distances with the use of NIV.<sup>3</sup> The use of NIV is also associated with delayed intubation which resulted in emergent intubation increasing the risk of mistakes with donning PPE.<sup>3</sup> The ICU mortality rate of patients receiving NIV in Wuhan, China was 79% (23 of 29).<sup>2</sup> Of those patients who went on to require intubation, the mortality rate was 86% (19 of 22).<sup>2</sup>

**Bag-mask ventilation** can increase risk of viral spread.<sup>4</sup> To reduce the risk of generating contaminated aerosols a HEPA filter should be used between the manual resuscitator and the patient interface.<sup>4</sup> Intubation should only be attempted in a negative pressure room.<sup>4</sup> **Mechanical ventilation** should be considered early for the deteriorating patient. Mechanical ventilation should focus on lung protective strategies and high PEEP levels. Prone positioning should be considered for severe ARDS with a P/F ratio less than 150. ECMO should also be an early consideration.

## Reference:

1. Cheung, J. C. H., Ho, L. T., Cheng, J. V., Cham, E. Y. K., & Lam, K. N. (2020). Staff safety during emergency airway management for COVID-19 in Hong Kong. *The Lancet Respiratory Medicine*. Accessed March 11,2020
2. Ñamendys-Silva, S. A. (2020). Respiratory support for patients with COVID-19 infection. *The Lancet Respiratory Medicine*. Accessed March 11,2020
3. Wax, R. S., & Christian, M. D. (2020). Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. *Canadian Journal of*
4. Zhonghua Jie He He Hu Xi Za Zhi (2020) Expert consensus on preventing nosocomial transmission during respiratory care for critically ill patients infected by 2019 novel coronavirus pneumonia doi: 10.3760/cma.j.issn.1001-0939.2020.0020. [Epub ahead of print] Accessed March 11,2020March 11, 2020

## Equipment Change Schedules

- minimize breaks in the circuit

## HEPA Filter

- Mechanical Ventilators
  - Observed increase in expiratory resistance on flow waveform or filter reservoir is full.
- Tracheostomy T-piece
  - filter reservoir full or patient has increased work of breathing on exhalation
- Aerosol Set-up
  - when visibly soiled
- Resuscitation bag
  - keep filter on bag when not in use, change when visibly soiled

## Equipment Availability

### HEPA Filters

- Servo DuoGaurd (use on ventilators)
  - Normal stock in supply rooms
- Draeger Carestar 55
  - Available in RT office

### One Way Valves

- Available in nitric oxide supplies on 4<sup>th</sup> & 7<sup>th</sup> floor North Equipment Rooms

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