

Respiratory Care Practice Guidelines for Adult COVID-19 POSITIVE or PUI patients

These practice guidelines were updated in the context of YNHHS PPE and testing practices and optimize the safety practices around respiratory treatments and devices in **Adults with COVID Isolation (Positive or Persons Under Investigation/PUI patients)**.

Transport through the hospital

- Patients on nasal cannula, HFNC or oxymizer must wear a face mask or 100% NRB covering their nose and mouth. Transport on HFNC is limited due to the technical limitations of the device. It is permissible within the *same ward* or *adjacent wards*.
- Non-invasive continuous bronchodilator nebulizers can be paused for the brief period of transport on most patients¹. On the rare occasion that a patient will not tolerate a pause in non-invasive continuous bronchodilator nebulizers, they should remain in their room until stabilized or intubated.
- Continuous nebulized epoprostenol or nitric oxide gas should never be paused. When delivered non-invasively, patients may transport with a face mask covering their nose and mouth (see transport on HFNC above).
- Continuous nebulized or gas medications (bronchodilators, epoprostenol, nitric oxide) administered in a closed circuit, i.e. mechanical ventilation can be continued on transport.
- Most patients on NIPPV can tolerate a break for transport. Patients unable to tolerate a break should have minimal leak from the mask interface and a face mask placed over the exhale vent in the mask interface prior to transport.
- A bacterial-viral filter can be placed on the tracheostomy tube directly, allowing for venturi masks during transport or ambulation.
- Patients on mechanical ventilation should always have good visualization of their endotracheal tube or tracheal tube. A face mask should not be used, as it obstructs this view.

Nebulized Medication

- MDI treatments are preferred. May use higher doses (i.e. 6-12 puffs) with spacer.
- Small Volume Nebulizers (SVN) are permissible when strongly clinically necessary or patient fails MDI. These may be administered via filtered nebulizer and should be self-administered when patient is compliant.
- Intubated patients may receive small volume nebulizers (SVN) and nebulized epoprostenol via Aerogen delivery system.
- Continuous nebulizers for severe asthma exacerbation should have frequent clinical evaluation with aim to transition to small volume nebulizers or MDI as soon as clinically feasible.

Oxygen Nasal Cannula or Oxymizer

- Nasal Cannula flows per routine use. Avoid using aerosol /Venturi masks.
- Oxymizer use is restricted to COVID positive patients coming *off* HFNC who do not tolerate nasal cannula (transitional step).
- Patients requiring higher FiO₂ should be transitioned to an alternate oxygen (100% NRB, HFNC, intubate).
- Patients that desaturate with movement may benefit from 100% NRB PRN for 5-10 minutes before movement. Order 100% NRB PRN pre-oxygenate for activity.

High Flow Nasal Cannula (HFNC)

- Maximum setting is 50 LPM and 100% FiO₂. If pt remains hypoxemic or tachypnic consider alternate oxygen (100% NRB, intubate).
- Nasal prongs **must** be well seated in the nares with **minimal leak**. Use of HFNC with minimal leak is preferable to NIPPV.
- Patients that desaturate with movement may benefit from 100% NRB PRN for 5-10 minutes before movement. Order 100% NRB PRN for activity. Continuous use of 100% NRB simultaneously with HFNC 100% 50LPM is an indication for intubation.

Note: 1. The peak effect of continuous nebulized bronchodilators (albuterol, ipratropium) for severe asthma exacerbation may be seen after 1-2 hours, with a half life of 4-6 hrs, making the 2 hour mark a reasonable time to pause medication for transport, and either wear face mask with or without nasal cannula or 100% NRB.

Non-Invasive Positive Pressure Ventilation (NIPPV=BIPAP or CPAP)

Acute Respiratory Failure – defined by *new* use or increased use of NIPPV

- Acute Hypoxemic respiratory failure – NIPPV use in the setting of COVID pna/ARDS is discouraged. Patients that fail 100% NRB or maximum HFNC 100% 50LPM, are more appropriate for invasive mechanical ventilation.
- Acute Hypercarbic Respiratory Failure – is appropriate for a trial of NIPPV. If severe (pH<7.20), consider intubation
- Clinical worsening or non-improvement after 1hr, RR>30, aspiration or nasopharyngeal bleeding, skin breakdown from mask, inability to tolerate breaks or take PO are indications for invasive mechanical ventilation.
- ALL patients on NIPPV for Acute Respiratory Failure are **required** to have an **ABG AND clinical assessment** within one hr to determine either continuance of NIPPV or advancement to Intubation.
- **Maximum Settings: IPAP 25 cm H2O and EPAP 15 cm H2O.**

Chronic Respiratory Failure on NIPPV at home

- Home machines and home interface devices (i.e. nasal mask, face mask) are permitted within patient’s room when hospital machines/interfaces are not tolerated by patient.
- Higher settings (above home settings) indicate patients have acute respiratory failure (see above).
- ALL NIPPV will be set up with a **filtered circuit on the expire valve.**
- **Good mask seal** *must* be ensured. Leaks >20% should be reported to respiratory supervisor and provider.

	COVID POSITIVE	COVID NEGATIVE
Acute HYPOXEMIC RF	NIPPV discouraged	NIPPV per usual practice*
Acute HYPERCARBIC RF	NIPPV per usual practice	NIPPV per usual practice

*NIPPV use in Acute Hypoxemic Respiratory Failure has limited benefit, particularly in ARDS. Refer to YNHHS NIPPV Guidelines.

Suctioning and Physiotherapy

- Chest Physiotherapy (vest or manual percussor), Cough assist device and OPEP (Acapella/Aerobika) are indicated in patients with cystic fibrosis, bronchiectasis and neuromuscular disorders. For patients that do not have these diagnosis, application of these therapies should be reserved for patients with clinically significant indications. Please see the Respiratory Care Guidelines for Cystic Fibrosis for guidance on safe practice . HCP should maintain arms length when administering and minimize time in the room afterwards.
- Suctioning should be done *in-line* when clinically appropriate. Nasal and oropharyngeal suctioning is appropriate when needed.

Patient’s Home Equipment

- Home ventilators and home NIPPV machines do not allow for filtration of the exhale circuit. Hospital ventilators and NIPPV machines are preferred, but home devices are permissible within a COVID isolation room, if the patient does not tolerate hospital devices.

Tracheostomy tube

- During trials off the ventilator, a closed T-piece filtered system can be attached to provide aerosol oxygenation/humidification with an in-line suction catheter and appropriate filters. The trach **cuff should be deflated** during this time (usual practice).

Extubation

- Resolving Respiratory Failure: *Per usual practice.* Do NOT stand directly in front of the patient. Position yourself optimally to avoid path of coughing. Suction as needed.
- Transitioning to Comfort Measures with ongoing respiratory failure:
 1. Titrate comfort medications to comfort prior to extubation.
 2. Extubate *per usual practice* with appropriate PPE on staff. Minimize staff in the room
 3. Supplemental oxygen via nasal cannula may be provided to the patient, depending on goals of care.
 4. A face mask may be placed on the patient, if comfortable.

5. Family members should not be present during extubation. If family are present *immediately within* 30 minutes post-extubation in a negative pressure room or 60 minutes in regular pressure room, a respirator should be worn in addition to face shield/eye protection, gown and gloves. If 30-60 minutes passes post-extubation, a face mask (not respirator) is appropriate for use in addition to face shield/eye protection, gown and gloves.

- Patients that have expired while on mechanical ventilation can be extubated per our usual process. If the descendant is going for evaluation by the medical examiner or autopsy, ETT may be cut to the lip for viewing purposes and left in place.

References:

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Yu IT, Xie ZH, Tsoi KK, et al. Why did outbreaks of severe acute respiratory syndrome occur in some hospital wards but not in others? *Clin Infect Dis* 2007; 44: 1017–25.

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Please contact Respiratory Care leadership any questions related to these practice guidelines.