

BWH/MGH Emergency Medicine Guideline for Intubating Patients with Suspected nCoV-19

I. PRINCIPLES

- Reduce aerosolizing virus
- Maximize first attempt success
- Reduce personnel exposure

II. Reduce Aerosolizing Virus

1. Early Tracheal Intubation vs. Primary management with BiPAP or HFNO

- a. If oxygenation and ventilation support is needed, **early tracheal intubation** is recommended instead of attempts to primarily manage with NIPPV or HFNO.
- b. Prior SARS experience showed that BiPAP and manual bagging both increase the risk of airborne viral particles and > 90% of patients ultimately failed trials of NIPPV.
- c. If starting with oxygen therapy first (patients with mild-moderate symptoms and oxygen debt), intubation is advised if, after 2 hours, the patient exhibits any of the following:
 - i. Persistent or worsening tachypnea >25-30 breaths per minute
 - ii. Persistent or worsening work of breathing
 - iii. Persistent low oxygen saturations <93% despite supplemental oxygen
 1. In general, for COVID patients if more than 6-8L of oxygen is required to keep the oxygen saturation at 92% then strongly consider intubating.

2. Intubate in a negative pressure room and avoid nebulized medications whenever possible

3. **Rapid sequence intubation is the preferred method.** Use awake intubation only when absolutely indicated because of the potential for viral spread due to coughing during application of topical anesthesia and laryngoscopy.

4. During RSI, use high-dose neuromuscular blocking agents (NMBA) for faster and more complete apnea and no residual cough. Even with high-dose NMBA use, **respect the NMBA onset time.**

- a. 2.0 mg/kg IV of Succinylcholine or 1.5 mg/kg IV of Rocuronium
- b. Do not attempt to manipulate the airway until patient-initiated respirations have ceased.

5. Ambient pressure pre-oxygenation whenever possible

- a. **Manual bagging and PPV only if clinically necessary**

- i. **Only the attending or senior resident** should hold the mask if temporary bagging is deemed necessary. This should be done with a two handed thenar grip to ensure tight mask seal.
 - b. Use a low volume and higher frequency approach if bagging is required
 - c. **Place a HEPA filter** between the ETT and bag
- 6. Limit ventilator disconnects
 - a. Communicate often with RT regarding need for ventilator checks and disconnects.
 - b. If disconnects are required (i.e. transition from room to portable ventilator) do so quickly and at **end-expiration**.
 - c. Can consider smooth clamp on the ETT before disconnect
 - d. **Place a HEPA filter** between ETT and ventilator.

III. Maximize First Attempt Success – This will reduce the need for bagging between attempts.

1. **Experienced clinician should intubate**

- a. This should be the attending or senior resident at the attending’s discretion.

2. **Video Laryngoscopy**

- a. Increased first attempt success with VL compared to DL

3. **Have all required *disposable* airway equipment at the bedside.**

- a. ETTs, bougie (use pre-loaded or have as an adjunct), iGel, syringe (with immediate balloon-up after tube placement), in-line suctioning, lube, ETCO₂, VL with multiple blade sizes/shapes, single-use Mac/Miller set-up, cric kit.

4. **Focus on robust preoxygenation.** This will provide more time for a first-attempt intubation success. Benefits of preoxygenation must be weighed against the risk of aerosolized viral particles however patient safety is paramount. Intubating a hypoxic patient who will desaturate rapidly after RSI meds are given puts them at risk of dying during the procedure.

- a. Preoxygenate with 3-5 minutes of tidal breathing on NRB mask at 15 L/min flow with upright positioning.
- b. We are not recommending *starting* with “flush-flow” rate facemask preoxygenation for these patients. This might result in excess L/min flow which would leak out of the mask margin.
- c. **Avoid nasal cannula for apneic oxygenation** as this will aerosolize viral droplets during intubation.
- d. If the patient remains hypoxic (<93%) and the ability to preoxygenate with NIPPV using a closed ventilator circuit and non-vented mask is unavailable, then there are two options:
 - i. Hold a resuscitation bag and mask tightly on the patient’s face using two hands (attending or senior resident only) turn oxygen flow rate up as needed for SaO₂, attach a PEEP valve and have the patient breathe passively through the bag fitted with a HEPA filter. Perform synchronized bag-assist only if needed.

- ii. Transition to flush-flow rate preoxygenation. If this is done, intubation MUST be in a negative pressure room and ensure all providers pay extreme attention to personal protective equipment (PPE).
- 5. Switch to BiPAP if still hypoxic (<93%) and the ability to perform NIPPV with a closed-circuit ventilator is available. **Ensure a tight-fitting mask**. Providers may have to hold the mask manually to ensure a tight seal and reduce leak around the margin of the mask. Optimally, this would be done using a closed circuit dual-limb ventilator [this ventilator should be in the room or en route because of the intubation]. You will need to ask RT to bring a **non-vented mask** that attaches to standard ventilator tubing. Avoid using a standard single-limb NIPPV machine, if possible, because these machines need to vent exhaled gas into the room.
 - a. Continue positive pressure ventilation until the patient is apneic and then **suspend** the ventilator before removing mask as intubation proceeds.
- 6. Have second airway manager donned outside room ready to assist. **For anticipated difficulty (poor oxygenation, anatomic challenges, etc.) or when a complex airway procedure is expected, two donned providers should be in the room (both senior resident and attending).**

IV. Reduce Personnel Exposure

*PROVIDERS SHOULD NOT INTUBATE WITHOUT PROPER PPE LISTED BELOW

1. Enhanced droplet PPE
 - a. Bonnet, N95 or PAPR, goggles, face shield, gown, gloves pulled over end of gown sleeves. Use a double glove technique.
 - b. If you require a PAPR (i.e. operators with beards) and no PAPR is available, call “Central Equipment” at 2-7117.
2. Follow all **donning and doffing procedures with observer-ensured compliance and hand hygiene**.
 - a. First either wipe down outer gloves with PURPLE wipes or put clean pair of gloves on top of dirty gloves.
 - b. Second, wipe down video laryngoscope.
 - c. Allow 3 minutes for drying time of PURPLE wipes and then push video laryngoscope outside of room.
3. Use VL
 - a. **Better intubator-patient distancing** by using the screen and not by looking closely through the patient’s mouth.
4. Only clinicians that have completed PPE training can intubate
5. Minimize number of clinicians in the room needed to complete the intubation.
 - a. Limit to a 3-person intubation team *when possible*: Primary RN, RT and MD.
 - b. During intubation, unless needed immediately at the bedside, other providers in the room should be six feet away from the patient’s head.
 - c. SARS experience revealed that cross contamination was highest when > 3 people were in the room.
 - d. Debrief with the care team after each intubation

References

1. Zou M, Yuguang H, Wuhua M, et al. Expert Recommendations for Tracheal Intubation in Critically Ill Patients with Novel Coronavirus Disease 2019. *Chinese Medical Sciences Journal*. Feb 2020 [epub ahead of print].
2. Wax RS, Christian MD. Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. *Can J Anesthesia*. Feb 2020 [epub ahead of print].
3. Zucco L, Levy N, Ketchandji D, et al. Perioperative considerations for the 2019 Novel Coronavirus (COVID-19). Clinical communication from The Anesthesia Patient Safety Foundation (APSF). Online publication Feb 2020.
4. Kamming D, Gardam M, Chung F. Anesthesia and SARS. *Brit J of Anesth*. 2003 Jun;90(6):715-8
5. COVID-19 Airway Management. Clinical communication from the European Airway Management Society (EAMS).

Last Updated: 03-30-2020

Document Editor: Calvin A. Brown III

HEPA Filter location when attached to a resuscitation bag.

