

LifeFlight of Maine Airway Management Guidelines for Patients with suspected concerns for Covid-19.

March 22, 2020

Adopted from primary sources:

- a. Brigham and Women's and Massachusetts General Hospital Departments of Emergency medicine.
- b. Consensus statement: Safe Airway Society: principles of airway management and endotracheal intubation specific to the COVID 19 adult patient group.
- c. Center for Disease Control and Prevention: Interim Guidance for management and treatment of Coronavirus Disease: Covid-19.

Background: Since the outbreak of the Covid-19 Corona Virus Pandemic, approximately 80% of confirmed cases have resulted in mild febrile illness, however 17% of patients have required hospitalization with less than 4% requiring mechanical ventilation. To this end, there have been a variety of sources that have made recommendations around the airway management of these critical patients.

Transmission of Covid-19 is primarily through droplet spread. These droplets not only can be aerosolized, but also contaminate surrounding surfaces. Thus, it is the goal of the information below to provide vital information for staff to protect themselves as well as the patient during high risk encounters. LifeFlight of Maine has developed specific recommendations around personal protective equipment (PPE) and subsequent cleaning procedures. Please refer to these guidelines concurrently for additional information on these specific topics.

When providing airway management or other procedures (including needle decompression or tube thoracostomy), it is imperative that providers are aware of events that generate contaminated aerosols and are aware of procedures that can further generate conditions that will exacerbate the spread of aerosols (See Table 1. Risks for Healthcare providers (Adopted directly from SAS Consensus statement)).

Table 1. Risks for Healthcare providers (Adopted directly from SAS Consensus statement).

Aerosol generating Events	Procedures vulnerable to aerosol generation
Coughing or sneezing	Laryngoscopy
Non-invasive or positive pressure ventilation with inadequate seal	Endotracheal intubation
High flow nasal cannula oxygen (HFNO)	Bronchoscopy/ gastroscopy
Delivery of nebulized medications via simple face mask	Front of neck Airway procedures including tracheostomy and cricothyrotomy
Cardiopulmonary resuscitation (Prior to intubation)	
Tracheal suctioning without a close system	
Tracheal extubation	

Note: The reliability of a seal is greatest with the endotracheal tube > Supraglottic airway > facemask

Guiding Principles.

There is no reason to develop new airway protocols around management. New checklists and procedures cause confusion around a procedure that staff have a familiarity and comfort. Rather, it is appropriate to insert some guiding principles that will help minimize contamination of the provider while maintaining the safety of the patient. These guiding principles include:

1. Reduction of virus aerosolization.
2. Maximize efficient airway management.
3. Minimize personnel exposure.

I. Reduction of Virus Aerosolization

1. Complete airway management and invasive procedures in a negative pressure room *if available and feasible* and avoid nebulized medications whenever possible.
2. If there is an option to use disposable equipment, this is always preferred over reusable equipment.
3. Early endotracheal Intubation vs. Primary management with BiPAP or High Flow Nasal Cannula (HFNO).
 - a. If oxygenation and ventilation support is needed, **early endotracheal intubation** is recommended instead of attempts to primarily manage with BiPAP or HFNO.
 - b. Prior SARS experience showed that BiPAP and manual bag valve mask ventilation both increase the risk of airborne viral particles and > 90% of patients ultimately failed trials of non-invasive positive pressure ventilation.
4. **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.
5. 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. Rocuronium 1.2mg/kg IBW
6. Ambient pressure pre-oxygenation whenever possible
 - a. **Manual bag valve ventilation and PPV only if clinically required.**
 - b. Use a low volume and higher frequency approach if manual ventilation is required.
 - c. **Place a HEPA filter** between the ETT and BVM (this can be with the same filter used on the ventilator).
7. Limit ventilator disconnects
 - a. If working with sending and receiving staff, communicate often with Respiratory Therapist (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. **Place a HEPA filter** between ETT and ventilator.
 - d. Consider clamping the endotracheal tube during transfer of ventilators to maintain recruitment and limit aerosolized exposure.

- II. Maximize efficient airway management – This will reduce the need for bag valve mask ventilation between attempts.
1. The most experienced available clinician should manage the airway first.
 2. **Focus on robust pre-oxygenation.**
 - a. Oxygen can be administered via nasal cannula with the general principle that the higher the flow, the higher the risk for aerosolization.
 - b. This will provide more time for a first-attempt intubation success. Benefits of pre-oxygenation 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 death during the procedure.
 - c. Preoxygenate with 3-5 minutes of tidal breathing on NRB mask at 15 L/min flow with upright positioning **AND** Place low flow nasal cannula at 5 L/min to be left in place for apneic oxygenation.
 - d. We are not recommending *starting* with “flush-flow” rate facemask pre-oxygenation for these patients. This might result in excess L/min flow which would leak out of the mask margin.
 - e. If the patient remains hypoxic (<93%) and NIPPV is unavailable then transition to flush-flow rate pre-oxygenation. If this is done, intubate in a negative pressure room and ensure all providers pay extreme attention to personal protective equipment (PPE).
 3. **The video laryngoscope allows for safer provider / patient distancing** by using the screen and not looking directly in the oropharynx.
 - a. There is increased first attempt success with video laryngoscopy (VL) compared to direct laryngoscopy (DL)
 4. **Have all required *disposable* airway equipment at the bedside.**
 - a. ETTs, bougie (use pre-loaded or have as an adjunct), syringe (with immediate balloon-up after tube placement), lube, ETCO₂, VL with multiple blade sizes/shapes, single-use Mac/Miller set-up, cric kit.
 5. Switch to BiPAP if still hypoxic (<93%) and NIPPV is available. **Ensure a tight-fitting mask to minimize aerosolization.** Providers may have to hold the mask manually to ensure a tight seal and reduce leak around the margin of the mask.
 - a. Continue positive pressure ventilation until the patient is apneic and then **suspend** the ventilator before removing mask as intubation proceeds.
 6. **The other LifeFlight of Maine donned provider should be in the room with anticipated difficulty or need for complex airway maneuver.**

III. Minimize Personnel Exposure

1. Enhanced droplet PPE
 - a. Please refer to the LifeFlight of Maine Covid-19 SOP for further details about appropriate PPE.
 - i. PAPR or N-95 mask with surgical mask on top
 - ii. Gown
 - iii. Face Shield and/ or Goggles
 - iv. Double gloves
2. Follow all **donning and doffing procedures with observer-ensured compliance and hand hygiene.**
3. Minimize number of clinicians in the room needed to complete the airway management or invasive procedure situation.
 - a. SARS experience revealed that cross contamination was highest when > 3 people were in the room.
4. Complete all procedures that the patient requires sequentially to avoid additional staff exposures (i.e. IV access, airway management, OG/ NG tube placement, Foley catheter, etc)
5. Wash hands **IMMEDIATELY** after completing the necessary procedures.
6. Consider debriefing with the care team after each resuscitation.
7. Follow LifeFlight of Maine SOP for post-flight cleaning procedures of aircraft, ambulance and equipment.

Summary:

In an effort to minimize exposures to healthcare staff and ensure quality resuscitation of patients with suspected or confirmed COVID-19 coronavirus disease, it is essential to follow these three pillars of care:

- I. Minimize virus aerosolization.**
- II. Maximize efficient airway management.**
- III. Minimize personnel exposure by wearing appropriate personal protective equipment and following infection control procedures.**

References

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