Michigan Medicine Tracheostomy Guidelines in COVID-19 Era:

Based on our current understanding of COVID19, it is spread mainly through from person-to-person either via close contact with one another (within about 6 feet) or through respiratory droplets produced when an infected person coughs or sneezes. Procedures that creates such as tracheostomy and laryngectomy result in significant aerosol generation and lead to increased risk to others.

In cases of airway intervention, the goal is to try minimize aerosolization and thereby minimize the risk of viral transmission to health care providers.

Performance of Tracheostomy is a **high risk aerosol generating procedure (AGP)**. **Avoid performing tracheostomy in COVID19/PUI patients if possible** to avoid increased aerosolization risks to health care providers.

In an attempt to minimize the exposure to COVID-19 to healthcare workers, the following measures are suggested in tracheostomy (or laryngectomy) patients with either a confirmed diagnosis of COVID-19, persons under investigation (PUI), or unknown/asymptomatic status.

We will continue to follow all guidelines from the Michigan Medicine and Infection Prevention and Epidemiology (IPE). This is a dynamic time and best practices may change, so please defer to updated official communications from Michigan Medicine.

Emergency Trach/Airway:

Indication: Emergency with impending loss of airway where transoral ETT placement is unsuccessful and cannot be safely performed. If stable, attempt to transfer to the OR.

At this time, in patients with unknown COVID19 status, COVID19-positive or PUI, all health care providers performing emergent tracheostomy should wear COVID19 PPE.

In the setting of an emergency airway, the surgical airway team should don appropriate COVID19 PPE (see Michigan Medicine guidelines for the use of PPE) **before entering the room** and assisting with the airway and patient care.

Personal Protective Equipment for COVID19

http://www.med.umich.edu/i/covid19-careplan/pdf/PPE_guidelines.pdf

- PPE should be at the door/unit of all COVID19 and PUI patients
- **PPE should be donned appropriately PRIOR TO ENTERING THE ROOM before proceeding to assist**

Appropriate PPE is critical based on the Viral Exposure Risk:

- The Covid-19 virus is found in the respiratory tract and secretions, the GI tract and secretions, as well as blood. Eye protection is critically important.

- Though data are sparse, the virus may potentially be aerosolized during the use of electrocautery and during airway manipulation. **Hence PAPR/N-95 use for all tracheostomy related cases and procedures. (**http://www.med.umich.edu/i/covid19-careplan/protect.html)

Unprotected healthcare personnel SHOULD NOT be allowed in a room where an aerosol-generating procedure is/has been conducted.

If COVID19 status is unknown, manage patient as if they are COVID-19 positive. Given respiratory symptoms they will fulfil criteria for suspected COVID-19 and there will not be time for testing in this type of emergency situation.

End of procedure:

• **Careful DOFFING is critically important**. This is the moment of highest risk for self-contamination. Proper removal of PPE is critical to avoid cross contamination & potential exposure

http://www.med.umich.edu/i/covid19-careplan/protect.html

IPE Donning and Doffing Video: https://www.youtube.com/watch?v=GxhpChqWgX0&feature=youtu.be

In known COVID or PUI patients, the room will need to cleared for 60 minutes to allow adequate air clearance.

http://www.med.umich.edu/i/ice/resources/coronavirus/air_clearance_by_room.pdf

Elective Tracheostomy for Mechanically Ventilated Patients in the ICU:

Indication: Prolonged mechanical ventilation, major head and neck cancer/reconstructive cases to bypass potential airway obstruction

Carefully consider timing and indication of tracheostomy in all patients who being considered for tracheostomy, particularly those that are COVID19 positive or PUI. Given the risk of aerosol generation both during tracheostomy and after the procedure, defer tracheostomy in the COVID19/PUI population until absolutely necessary.

If previously COVID-19 positive and considering elective tracheostomy, recommend 2 negative COVID-19 tests separated by 24 hours AND resolution of fever and improvement of symptoms prior to proceeding to tracheostomy.

Decision for tracheostomy in any ICU patient should be a multi-disciplinary decision.

PPE for Elective Tracheostomy: Given this is a high risk AGP during the procedure, recommend COVID19 PPE.

Type and Location of Tracheostomy Procedures:

- There is no high quality data on the degree of aerosolization with open versus percutaneous tracheostomy techniques.
- The use of bronchoscopy with percutaneous tracheostomy may increase the risk of aerosolization during the procedure, but the degree of aerosolization and risk to the health care worker is felt to be equivalent to open procedures. *Therefore, can consider either open tracheostomy or percutaneous tracheostomy at the discretion of the faculty performing the procedure.*
    - For percutaneous tracheostomy performed with alternate techniques, such as with real-time ultrasound guidance without bronchoscopy, will further minimize risk to providers
- *Location of tracheostomy:* Recommend tracheostomy (either percutaneous or open) to be done in the ICU if possible.
    - Tracheostomy is favored to be performed in the ICU
    - **Strongly recommend performing tracheostomy procedure in airborne isolation rooms with negative pressure**; secondary choice is in negative pressure room with HEPA filter if airborne room is unavailable. Avoid in neutral pressure rooms
    - In cases not felt to be safe for bedside tracheostomy in the ICU, then transport to the OR is appropriate.
    - Follow Institutional protocols for transport of COVID19/PUI patients (http://www.med.umich.edu/i/ice/resources/coronavirus/patient_transport.pdf

- If a known COVID or PUI patient is taken to the OR, the room will need to cleared for 20-35 minutes to allow adequate air clearance. (http://www.med.umich.edu/i/ice/resources/coronavirus/air_clearance_by_room.pdf)

Unique Steps/Precautions During Tracheostomy Procedure:

These are unique and critical steps within a standard tracheostomy for COVID19/PUI patients:

- Preparation:

- Strongly recommend most senior/experienced surgeon/proceduralist available to perform the tracheostomy in COVID19/PUI patients
- Neuromuscular blockade
- Consider IV Glycopyrrolate 0.4mg to reduce secretions
- Inject with 2% lidocaine with 1:100,000 epinephrine to minimize bleeding and need for suctioning
- Runner outside room
- Ensure HEPA viral filter on ventilator and suctioning
- Double gloving
- Full draping to minimize contamination of surfaces
- Impervious sheets around patients
- Avoid electrocautery if possible; strongly recommend smoke evacuator cautery
- If possible, use single-use bronchoscope for percutaneous trach

- Use the following steps to minimize aerosolization during withdrawal of the endotracheal tube during **percutaneous tracheostomy**-
  - Confirm that patient has been on FiO2 100% through the procedure
  - The proceduralist must notify other members of the team that withdrawal of the tube will commence
  - Turn off mechanical ventilation
  - Withdraw endotracheal tube under appropriate guidance; consider Doppler to determine airflow as ETT pulled back
  - Inflate cuff, then resume mechanical ventilation

- Use the following steps to minimize aerosolization in open tracheostomy or percutaneous:
  - <u>During open tracheostomy</u>:
    - Anesthesia informed of imminent tracheal incision; all team members are prepared
    - Preoxygenation 100% for 3min then apnea
    - Ventilator 'OFF'
    - Cuff deflated just before incision down to trachea or pushed distal to avoid accidently popping balloon of the endotracheal tube (ETT)
    - ETT Pulled back 3 cm and visualization of tip of ETT at tracheotomy
    - **Minimize tracheal suctioning to avoid aerosolization**
    - Resume mechanical ventilation only **<u>after</u>** the tracheostomy tube balloon is inflated and a closed circuit re-established
    - After removal of ETT, place ETT in plastic bag for disposal

  - <u>During percutaneous tracheostomy</u>:
    - To minimize aerosolization during withdrawal of the endotracheal tube:
      - Confirm that patient has been on FiO2 100% through the procedure
      - The proceduralist must notify other members of the team that withdrawal of the tube will commence
      - Turn off mechanical ventilation
      - Withdraw endotracheal tube under appropriate guidance, consider Doppler to determine airflow as ETT pulled back
      - After extubation, place ETT in plastic bag for disposal
      - Inflate cuff, then resume mechanical ventilation
    - To minimize aerosolization during dilation:
      - The proceduralist must notify other members of the team that dilatation will commence
      - Turn off mechanical ventilation
      - Perform dilatation and delivery of tracheostomy tube, cover stoma with gauze between these steps
      - Consider performing dilatation and tube delivery under a clear plastic drape

- Resume mechanical ventilation only **after** the tracheostomy tube balloon is inflated and a closed circuit re-established

- End of procedure:
  - Consider a **xeroform trach pants** to further seal the tracheostomy incision to prevent leak and aerosolization until the stoma has closed around the tracheostomy tube
  - Need to ensure adequate cuff-pressure immediately to minimize leaks
  - Recommend largest tracheostomy tube appropriate for the patient to allow bronchoscopy in ICU patients; do not use fenestrated tracheostomy tube

Care of Tracheostomy Patients:

PPE for care of tracheostomy: http://www.med.umich.edu/i/ice/resources/coronavirus/ppe_pt_care.pdf

COVID19/PUI/Symptomatic Patients:

Because tracheostomy and tracheal suctioning is considered an AGP, all COVID19/PUI patients not connected to mechanical ventilation **should have an HME** (heat and moisture exchanger)/filter fitted to the tracheostomy tube. **Closed suctioning if available is strongly** recommended. During suctioning, change of inner cannula, disconnect from ventilator circuit, bronchoscopy through tracheostomy tube, and tracheostomy tube change, the caregiver(s) must wear appropriate COVID19 PPE (as above).

Laryngectomy patients are a unique group of patients that also have similar AGP risks to health care workers with generation of aerosolized respiratory droplets. Laryngectomy HME should be placed immediately and kept at all times regardless of COVID19 status given many carriers are asymptomatic. In COVID19/PUI laryngectomy patients, the addition of appropriate PPE based on their status should be in place for all suctioning, laryngectomy tube exchange, or airway manipulation.

http://www.med.umich.edu/i/ice/resources/coronavirus/ppe_pt_care.pdf

Untested/Asymptomatic Patients:

In untested/asymptomatic tracheostomy and laryngectomy patients should have an HME/filter on at all times and if possible/available, closed suctioning is recommended. *Strongly consider testing these patients if symptoms develop and placement in special pathogen precautions while awaiting testing results*; however, unless testing COVID19-positive, follow standard precautions (http://www.med.umich.edu/i/ice/resources/coronavirus/ppe_pt_care.pdf) with any tracheostomy/stomal interventions (i.e.: suctioning, tube/inner cannula exchange, changing HME/filter).

Decannulation: Should be done as soon as medically safe and immediately place occlusive dressing. Providers should be aware this can take up to 2 weeks to close and in 1-3% of patients will not close. **Laryngectomy patients cannot be decannulated nor should occlusive dressing be placed**.

Special Category: Care of Untested/Asymptomatic Pediatric Tracheostomy Patients:

- Pediatric tracheostomy patients who are asymptomatic should be maintained in standard precautions with healthcare providers wearing the appropriate PPE (http://www.med.umich.edu/i/ice/resources/coronavirus/ppe_pt_care.pdf).
- Patients should use closed suctioning systems for trach tube suctioning whenever possible to limit circuit disconnection and decrease risk of exposure
- Patients should use HME during the day and at night/naps as much as tolerated
  - If HME is not tolerated, can use of trach mask or tracheostomy covers with the goal to cover the tracheostomy as much as possible to minimize droplet spread
- Routine trach changes should occur every 4 weeks unless there is concern for mucus plugging or emergency situation. *Trach tube should absolutely be changed if there is concern for airway patency*.

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