Putting Safety First during the COVID-19 Pandemic: Practical Strategies for Frontline Healthcare Workers and Patients with Tracheostomy
Objectives

► Describe safe practices for performing suctioning, prosthesis fitting, or “Aerosol Generating Procedures” (AGP) in relation to COVID-19

► Discuss how considerations around risk of transmission have changed tracheostomy tube cuff management in the pandemic.

► Review best practices for tracheostomy stoma care and suctioning, both for mechanically ventilated patients and non-ventilated patients

► Discuss how to safely promote speech and swallowing among tracheostomy patients during COVID-19 crisis
Speakers: Allied Health Professionals

Respiratory Therapist

Brian Walsh, PhD, RRT, FAARC

- Professor and Director of Respiratory Therapy
- Past President of AARC (American Association of Respiratory Care)

Speech Pathologists

Charissa Zaga, SpPath, MPH

Tanis D. Cameron, MA, S-LP, SpPath

- Senior Speech Pathologists
- Tracheostomy Review And Management Services
- Austin Health, Melbourne, Australia
Speakers: Nurses and Physicians

Nurses

► Leah Lambe, BSN, RN, CEN
  • Nursing Clinical Coordinator
  • Rapid Response Team
  • Hospital of the University of Pennsylvania

► Troy J. DeRose MSN, CRNP, RNFA, CORLN, ANCC-C
  • Inpatient Care Coordinator, Dept. of Otolaryngology, Head & Neck Surgery, Thomas Jefferson University Hospital

Physician

► Karen F. Watters, MB, BCh, BAO, MPH
  • Associate, Dept. of Otolaryngology and Communication Enhancement
  • Assistant Professor of Otolaryngology, Harvard Medical School
Aerosol Generating Procedures

Aerosol-generating procedures (AGPs)
• Any procedure carried out on a patient that can induce production of aerosols of various sizes

Transmission risks
• AGP’s expose healthcare workers to pathogens causing acute respiratory infections
Examples of Aerosol Generating Procedures

Induced aerosol generation in respiratory tract

Mechanical aerosol generation in respiratory tract

Examples: Intubation, Bronchoscopy, CPR

Examples: Ventilation, Suctioning
Aerosol Generating Procedures

Figure 1: Particle number concentration measurements for baseline and procedure measurements collected for the targeted procedures. Baseline measurements were not collected for continuous procedures (mechanical ventilation and noninvasive ventilation).
Leah Lambe BSN, RN, CEN

► Nurse Clinical Coordinator, Rapid Response Team
► Nurse Lead, Airway Safety Committee
► Chair, HUP Tracheostomy Collaborative
► Hospital of the University of Pennsylvania, Philadelphia, USA
Goals of Personal Protective Equipment

- Provide exceptional patient care while still protecting the healthcare workers, patients, and our families
  - Wear proper PPE when indicated
    - Not wasting PPE – Ensuring supply for unknown duration
  - Ensure proper isolation precautions
  - Limit exposure to only those essential
Create ONE team
- Trauma/Emergency Surgery Attending, Sr Surgical Resident, and Respiratory Therapy in the room during procedure
- All dressed in full airborne precautions

Go to ONE approach
- Should be an open tracheostomy unless otherwise planned for
- Some prefer Percutaneous but should avoid bronchoscopy

Location, Location, Location
- Should be done bedside in a negative pressure room as first option
- OR 30 (Negative Pressure OR) as less desirable option
# Personal Protective Equipment Expectations

<table>
<thead>
<tr>
<th>COVID-19 Status</th>
<th>Care Being Performed</th>
<th>Isolation Requirements</th>
<th>Personal PPE</th>
<th>Room Placement</th>
<th>Transport Recommendations</th>
</tr>
</thead>
</table>
| Not Suspected / Unknown COVID-19 status* | Standard Care (i.e., not working with the trach) | STANDARD + DROPLET | • Earloop/Surgical Mask  
• Gloves | Private Room, if available | Cover mouth and stoma with surgical mask  
* Post sign (see pg.2) on patient's room door to alert people to check with nurse to determine if PPE is needed prior to entry |
| Tracheostomy Care:  
• Open suctioning  
• Cough Assist  
• Cleaning tracheostomy  
• Anything that will disconnect patient from vent (open circuit)  
• Bronchoscopy  
• Nebulizers | CONTACT + DROPLET + EYEWEAR | • Earloop/Surgical Mask  
• Eye protection (goggles or face shields)  
• Gloves  
• Disposable or reusable gown | |
| PUI (Under Investigation) | Standard Care: (i.e., not working with the trach) | CONTACT + DROPLET+ EYEWEAR | • Earloop/Surgical Mask  
• Eye protection (goggles or face shields)  
• Gloves  
• Disposable or Reusable Gown | Private Room (Airborne precautions/Negative Pressure, if available) | Avoid transport if possible—If transport is needed, mouth and stoma should be covered with surgical mask |
| Tracheostomy Care:  
• Open suctioning  
• Cough Assist  
• Cleaning tracheostomy  
• Anything that will disconnect patient from the (open circuit) vent  
• Bronchoscopy  
• Nebulizers | AIRBORNE + CONTACT + EYEWEAR | • N95**(or PAPR, if available)  
• Eye protection (goggles or face shields)  
• Gloves  
• Disposable or reusable gown | |
| COVID-19 Positive | Standard Care: (i.e., not working with the trach) | CONTACT + DROPLET+ EYEWEAR | • Earloop/Surgical Mask  
• Eye protection (goggles or face shields)  
• Gloves  
• Disposable or Reusable Gown | Private Room (Airborne precautions/Negative Pressure, if available) | Avoid transport if possible—If transport is needed, mouth and stoma should be covered with surgical mask |
| Tracheostomy Care:  
• Open suctioning  
• Cough Assist  
• Cleaning tracheostomy  
• Anything that will disconnect patient from vent (open circuit)  
• Bronchoscopy  
• Nebulizers | AIRBORNE + CONTACT + EYEWEAR | • N95**(or PAPR, if available)  
• Eye protection (goggles or face shields)  
• Gloves  
• Disposable or reusable gown | |
When to place a mask on the patient?

- When traveling outside the room
- When $O_2$ flow is higher than 6L
- If awake and cooperative
  - When staff enter the room
- When $O_2$ is not delivered on a closed system
  (Patient is off the ventilator)
Signage at the Bedside

- Signs are placed on the door of all tracheostomy patients admitted to the hospital.
- Helps staff to stop and think about what PPE they should be utilizing.
Signage at the Bedside

- Donning and Doffing step by step guides placed in all isolation rooms
- Subject Matter Experts (SME) help with the process in person to ensure adherence

<table>
<thead>
<tr>
<th>Applying (Donning) PPE</th>
<th>Removing (Doffing) PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Gather Supplies</td>
<td>1 Sanitize Gloved Hands</td>
</tr>
<tr>
<td>• PAPR - or - mask (surgical or N95) &amp; eye protection</td>
<td></td>
</tr>
<tr>
<td>• Yellow isolation gown</td>
<td></td>
</tr>
<tr>
<td>• 1 Pair Nitrile gloves</td>
<td></td>
</tr>
<tr>
<td><strong>2</strong> Remove Jacket, ID, Cell Phone</td>
<td>2 Remove Isolation Gown</td>
</tr>
<tr>
<td><strong>3</strong> Perform Hand Hygiene</td>
<td>• Roll into Ball</td>
</tr>
<tr>
<td><strong>4</strong> PAPR ONLY:</td>
<td>• Discard into Soiled Linen Bin</td>
</tr>
<tr>
<td>• Clip Battery to Waist (pocket, pants or belt)</td>
<td></td>
</tr>
<tr>
<td>• Plug PAPR Cord into Battery</td>
<td></td>
</tr>
<tr>
<td>• Confirm air flow and lights</td>
<td></td>
</tr>
<tr>
<td><strong>5</strong> Don Face Protection</td>
<td>3 Remove Gloves and Perform Hand Hygiene</td>
</tr>
<tr>
<td>• Surgical mask &amp; eye protection,</td>
<td></td>
</tr>
<tr>
<td>• or</td>
<td></td>
</tr>
<tr>
<td>• N95 mask &amp; eye protection,</td>
<td></td>
</tr>
<tr>
<td>• or</td>
<td></td>
</tr>
<tr>
<td>• PAPR (adjust ratchet to a snug fit)</td>
<td></td>
</tr>
<tr>
<td><strong>6</strong> Don Isolation Gown</td>
<td>4 Exit Patient Room</td>
</tr>
<tr>
<td><strong>7</strong> Don Clean Gloves</td>
<td>5 Perform Hand Hygiene</td>
</tr>
<tr>
<td><strong>8</strong> Remove Eye Protection &amp; Disinfect</td>
<td>6 Don Clean Gloves</td>
</tr>
<tr>
<td><strong>9</strong> Remove PAPR or Mask</td>
<td>7 Disinfect PAPR</td>
</tr>
<tr>
<td><strong>10</strong> Remove Gloves and Wash Hands</td>
<td></td>
</tr>
</tbody>
</table>
We currently use these cards for ALL tracheostomy patients – Modeled after U
Reusing PPE: What to expect & What is ok?

► Play Video
Reuse N95 respirators

• Applies to repeated use of N95:
  – on the same patient (if patient is COVID19 rule out)
  – with multiple patients (if all patients are COVID19 confirmed)
• N95 may then be reused for the entire shift
• Reuse requires a cleanable face shield or a surgical mask/face shield work over the N95 respirator.
Caring for multiple COVID-19 positive patients

- Continue to wear the same N95 into each positive room for whole shift.
- Cover N95 with a surgical mask or cleanable face shield.
- If covering N95 with a surgical mask, discard surgical mask when doffing in between patients.
- If covering N95 with a cleanable face shield, clean the face shield in between patients.
Caring for Patients Under Investigation (PUI/Rule outs)

• Use **one N95 per patient** and re-wear for the whole shift
• Cover N95 with surgical mask or cleanable face shield
• If covering N95 with a surgical mask, discard surgical mask when doffing in between patients
• If covering N95 with a cleanable face shield, clean the face shield in between patients

Information above referenced from the World Wide Web on April 6th, 2020 @ CDC.GOV website https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
Reusing PPE: What to expect & What is ok?

- **Reuse**
  - Refers to the practice of using the same N95 respirator for multiple encounters with patients but removing it (‘doffing’) after each encounter
  - The respirator is stored in between encounters to be put on again (‘donned’) prior to the next encounter with a patient
  - CDC recommends that a respirator classified as disposable can be reused by the same worker as long as it remains functional and is used in accordance with local infection control procedures

Information above referenced from the World Wide Web on April 6th, 2020 @ CDC.GOV website https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
Inpatient Care Coordinator
Department of Otolaryngology, Head and Neck Surgery
Thomas Jefferson University Hospital
Hierarchy of Controls

Most effective

Elimination
- Physically remove the hazard

Substitution
- Replace the hazard

Engineering Controls
- Isolate people from the hazard

Administrative Controls
- Change the way people work

PPE
- Protect the worker with Personal Protective Equipment

Least effective

Source: NIOSH
Hierarchy of Control

Controlling exposure to occupational hazards is key in protecting personnel

- Multiple strategies reduce risk:
  - **Elimination** (physically removing the hazards)
  - **Substitution** (Replacing the hazard)
    
    **Note:** Both (above) are not typically options for Health Care settings

- Transmission of respiratory pathogens in healthcare facilities can be reduced or avoided through **engineering** and administrative controls, in addition to PPE

Information above received from the World Wide Web on April 6th, 2020 @ CDC.GOV website
Detection, Triage, and Isolation

Prompt detection and effective triage and isolation of potentially infectious patients are essential to prevent exposures to

- Patients
- Healthcare Workers
- Visitors at the facility

Note: In times of pandemic, visitors should be minimized.
Engineering Controls

▶ Reduce exposures for HCP by placing a barrier between the hazard and the HCP

• Use airborne isolation rooms judiciously

• Use physical barriers (i.e. Glass or plastic windows)

• **Closed system in-line suctioning**
  – Reduces aerosols from airway suctioning

• Ensure ventilation systems are properly maintained

Information above received from the World Wide Web on April 6th, 2020 @ CDC.GOV website
Tracheostomy and Laryngectomy patients present unique challenges with regards to droplet and aerosol generation.

Precautions apply to all patients, including COVID patients unknown and negative.

Clinical suspicion is inadequate; once COVID-19 is in your facility, treat all tracheostomy patients as potentially positive.
Open Airway Clinical Management Guidelines (Updated 04/04/2020)

- **Open Airway**: a laryngectomy or tracheostomy in a non-ventilated patient

- **Methods to "close" the system**: (imit droplet and aerosol spread)
  - Heat and moisture exchangers (HME)
  - Respiratory therapists consult to assess setup and patient tolerance

- **Additional monitoring is needed** in patients who cannot demonstrate the ability to independently remove the setup/HME if they become intolerant
  - Continuous pulse oximetry
Tracheostomy Care

► Use disposable inner cannulas
  • To minimize exposure to aerosol particles
Tracheostomy Suctioning

In-Line Suction with HME
Tracheostomy Suctioning

T-Piece with in-line Suction, Humidification, and Filter
Laryngectomy Patients

Baseplate with HME  Adhesive base plate
Laryngectomy Patients

Larytubes with HME Cassettes
Brian K. Walsh, PhD, RRT, FAARC

- Professor and Director of Respiratory Therapy
- Past President of the American Association for Respiratory Care
- Liberty University
- Lynchburg, Virginia USA
Cuff Management, Humidification
How to Protect yourself when assisting an Emergency or Routine Tracheostomy during this COVID-19 era
Cuff Management

► Cuff manometer
  • 20-30 cmH₂O
  • < 20 likely produces micro-aspiration, is associated with ventilator associated pneumonia and may produce aerosols
  • > 30 cmH₂O? Size of trach or other

► Minimum occlusion volume
  • Add a volume until no leak is heard

► Minimum leak technique
  • Completely inflate the cuff
  • Then remove air/water until a leak is heard
Filters: Why Filter?

• Protect Healthcare Workers

• Aerosol generating procedures include:
  – medication treatment; diagnostic sputum induction; bronchoscopy; airway suctioning; endotracheal intubation; positive-pressure ventilation via facemask (e.g., BiPAP, CPAP), during which air may be forced out around the facemask; and high-frequency oscillatory ventilation (HFOV)

• Types of filters
  – High-efficiency particulate air (HEPA) filter
  – Bacteria / Viril Filters
  – Hydrophobic
  – Inspiratory / expiratory / Heat Moisture Exchange + Filter
Filters

HEPA Hydrophobic $$$

Expiratory Flow

Bacterial / Viral $

Inspiratory Flow
Humidification

- Goal = humidification and filtration
- Cool/Heated Aerosol – not recommended
- Heated Humidifier – Doesn’t produce and aerosol
- Heat Moisture Exchange (HME)
- Heat Moisture Exchange + Filter (HMEF)
Protecting yourself + duty to treat

- Airway emergencies
  - PPE (airborne)
  - Suctioning – inline
  - Filter needs to remain of the
Emergent or Routine Tracheostomy

- Full PPE – Airborne with N95
- Waterproof covering
- Hair Coverage
- Layers
  - Double glove
  - Double layers of covering

Fig. 4  Gradual dilator advanced into the trachea to the skin
Emergent or Routine Tracheostomy

COVID Go bags (take in only what you need)
- Limit personnel
- HEPA Filters
- Inline suction catheters
- Surgical gloves / coverings
- Plexiglass boxes

Approach to tracheostomy
- Likely not one is less aerosol generating
- Pulmonary reserve
Charissa Zaga, B.SpPath, MPH, PhD Candidate

- Senior Speech-Language Pathologist
- Stream Leader ICU, Ventilation Unit, Respiratory, Cardiothoracics, and Spinal Units
- Austin Health, Melbourne, Australia
Aerosol-Generating Procedures

According to International speech pathology organizations, AGP include:

• Clinical evaluation of swallowing
• Videofluoroscopic swallow study (VFSS)
• Fiberoptic endoscopic evaluation of swallowing (FEES)
• Flexible laryngoscopy with or without Videostroboscopy
• Laryngectomy management
• Tracheostomy management, with or without ventilation
Invasively Ventilated Patients with a Tracheostomy

- Utilize a **closed respiratory circuit**
- Cuff deflation is an AGP
- Communication interventions are considered as AGPs
  - Above cuff vocalization
  - One-way speaking valve in-line with the ventilator
  - Ventilator-adjusted leak speech
Invasively Ventilated Patients with a Tracheostomy

► COVID-19 positive/suspected patients

- Cuff should remain inflated
- In certain situations, brief periods of cuff deflation may be deemed necessary
  - Close consultation with the MDT, duration of cuff deflation should be minimised
Invasively Ventilated Patients with a Tracheostomy

- COVID-19 negative and low-risk for screening
  - Cuff deflation to facilitate communication should be pursued with caution
Spontaneously Breathing Patients with a tracheostomy

- Utilize an open respiratory circuit
- Weaning approaches to promote early cuff deflation for communication may require reconsideration
- The extent to which cuff deflation for one-way speaking valve use increases aerosolization of viral particles in this already open circuit is unknown
- A conservative approach should be used when assessing airway protection and upper airway patency
Tracheostomy weaning

Nasal endoscopy is not routinely performed

- Clinical assessment of voice and upper airway patency relies on SP expertise
Tracheostomy weaning

Safety of Speech Pathologists and MDT should be balanced with the need to decannulate patients safely

- Consider delaying cuff deflation for one-way valve use or capping of the tracheostomy
- Consider patients wearing a surgical mask while their cuff is deflated
Tanis S Cameron MA S-LP

- Spa Practicing Member; ASHA International Affiliate
- Manager TRAMS
- Tracheostomy Review and Management Service
- Senior Speech Pathologist
- Austin Health, Melbourne, Australia
- Vice Chair Global Tracheostomy Collaborative
Airway Protection and Swallowing

- Reliance on clinical expertise in the assessment of airway protection, oral secretion management, and swallowing
- No VFSS or FEES
- Bedside clinical swallowing examination
  - PPE and social distancing measures

Note: Loss of smell/taste is a common symptom of COVID-19
Communication

- Communication is crucial to ensure safe care and improve quality of life.
- PPE is likely to exacerbate communication barriers and feelings of anxiety, fear and helplessness.
- Patients will feel isolated.
- Opportunity to upskill the MDT about supportive communication strategies.
Karen F. Watters, MB, BCh, BAO, MPH

- Associate, Department of Otolaryngology and Communication Enhancement
- Assistant Professor of Otolaryngology
- Harvard Medical School
Practical Strategies for Front-Line Health Workers and Patients with Tracheostomy

Pediatric Considerations
Tracheostomy Placement

- Indications different in pediatric population
- Multidisciplinary discussion
- Pre-op COVID-19 testing (if possible)
- Cuffed tubes
- In-line suctioning
- Avoid ventilator disconnections
“Aerosol” Generating Procedures (AGPs)

- Open Suction
- Manual ventilation
- Flexible tracheoscopy
  - Discussion with ICU/ primary team
  - Only if it will result in a change of care
- Tracheostomy changes
Use Anesthesia C-Mac Video Laryngoscope
Tracheostomy Homecare

- Caregiver education
- Homecare supplies
  - Tracheostomy & ventilator (tubing, etc.)
- Homecare nursing
- Multidisciplinary Teamwork
Speaker Names and Contacts

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A link to the webinar will be sent out in the next 24 – 48 hours

Share with colleagues who were unable to attend
Seeking Articles for GTC Newsletter!!

► Success story in your institution
► An upcoming program/event that you
  Tracheostomy quality improvement
► A personal story
► A related award

dotoole@globaltrach.org or
patientandfamilies@globaltrach.org

Deadline May 1st
European Perspective

Coming Soon!
Thank you and see you all soon

http://globaltrach.org/join-us/