Objectives

• Explain how the timing of the tracheotomy and tube selection criteria plays a key role in successful use of speaking valves.
• List complications of improper cuff management.
• List how the tracheostomy tube and inflated cuff can impact swallowing and suggest ways to reduce clinical complications.

Indications for Tracheostomy

• Prolonged mechanical ventilation
• Inability to perform translaryngeal intubation (trauma, max/fax deformity)
• Upper airway obstruction (temporary or permanent)
• Secretion management (neuromuscular disease)

Reputed Benefits

• Improved patient comfort/less need for sedation
• Lower WOB/faster weaning from MV
• Improved safety
• Improved oral hygiene and oral intake
• Less long term laryngeal damage
• Lower VAP rates
• Lower mortality
• Reduced ICU and overall LOS
• Earlier ability to speak/Improved participation

When: Timing of Tracheostomy

21 Days?
7-10 Days?
2-3 Days?

Does timing affect outcomes?
What does the literature say?
Endotracheal Tube Factors Cited To Contribute To Swallowing Impairment and Aspiration

- Mucosal injury to the oral pharynx and larynx
- Injury to the vocal folds which may be transient or permanent
- Tracheal edema, ulceration and stenosis

Laryngeal Intubation Granuloma

Endotracheal tubes are inserted through the mouth or nose into the trachea to maintain the airway or provide ventilation. Swallowing impairment and aspiration can occur with endotracheal intubation due to mucosal injury to the oral pharynx and larynx, injury to the vocal folds which may be transient or permanent, and tracheal edema, ulceration and stenosis.

HOW: TRACHEOTOMY PROCEDURES

- Open or Surgical Tracheotomy
  Tried and True Method

- Percutaneous Dilatation or Balloon Dilatation
  Tracheotomy
  Less costly and more convenient

- Cricothyroidotomy
  As seen on ER Shows

Does the method of tracheotomy affect outcomes?

Parts of a tracheostomy tube - ISO STANDARDS

- Neck flange
- 15 mm connector
- Tube shaft
- Inflation line
- Cuff
- Pilot balloon
- Pilot port with one way valve
Tracheostomy Tubes
- Single Lumen/Cannula
- Double Lumen/Cannula

Routine Tracheostomy Tube Changes
- After initial tracheotomy
  - Surgeon preference
- To assure stoma and tract established
- To reduce complication of granulation tissue
- For down-sizing
- Difficult airways and special considerations

Types of Tubes
- MATERIALS
  - PVC, Silicone, Metal
  - Metal Reinforced
- SHAPE
  - Curved, Angular, Non-pre formed
- LENGTH
  - Standard
  - Extra length
  - Proximal
  - Distal
  - Adjustable Range
- SINGLE LUMEN
- DOUBLE LUMEN
- FENESTRATED
- MRI COMPATIBLE
- Subglottic Suction
- Trach Talk
- CUFFS
  - Air, water, or foam
  - Double cuffed
  - Un-cuffed
  - Custom Made

Jackson Tracheostomy Tubes
- Improved Inner Cannula
- Original Style

Jackson Metal Tracheostomy Tubes
- Original Style
- Improved
- Permanent 15mm Adapter

PMV® 2020 (clear) With Jackson Improved
Calculating Tube Size

- ATS Consensus: The tracheostomy tube should take up no more than 2/3 the ID of the trachea. (For pediatrics, no adult standard)
- AP Diameter of trachea
  - Male: 18 +/- 5mm
  - Female: 12 +/- 3mm

Not all size 6 trachs are equal!!

<table>
<thead>
<tr>
<th>Size 6.0 Tracheostomy</th>
<th>OD</th>
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<tr>
<td>Portex</td>
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Extra Length Tubes

- Tracheal Malacia or Stenosis
- Increased skin-to-tracheal-wall distance

Cuff Choices

- AIR FILLED – minimal leak
- TTS™: WATER FILLED – minimal occlusion (can be air filled)
- FOME-Cuf® – self sealing
Tracheostomy: Procedures, Timing and Tubes

Air Filled Cuffs
- Cuff Inflated
- Cuff Deflated

Water Filled Cuffs
- Cuff Up
- Cuff Deflated

Cuff: Choices and Management
- Cuff up or down?
  - Purpose of cuff
  - Cuffs and aspiration
- Cuff pressures
  - 18-22* cm H₂O
  - Minimal Leak
  - Minimal occlusion

Cuff Management – Minimal Leak

Cuff Management – Direct Measure

Clinical Complications - Cuff
- Esophageal impingement
- Reflux
- Necrosis and Trauma
- Laryngeal tethering
- Reduced airway protection
Cuff Over-Inflation

Clinical Complications

- Reduced Airflow
  - Taste, Smell, Sensation
  - Voice
- Reduced Positive Airway Pressure
  - Physiologic Peep
  - Cough
  - Valsalva
  - Swallow
- Late Complications
  - Granuloma-Stenosis
  - Tracheal Malacia
  - Fistulae

Benefits of Passy-Muir® Valve

- Improved Voice/Speech
- Improved Smell & Taste
- Improved Swallow
- Improved Secretion Management
- Restored PEEP
- Improved Oxygenation
- Improved Quality of Life
- Expedited Weaning and Decannulation
- Cost Savings
- Shortened Length of Stay

Airway Assessment

- How does tube size and type affect airway assessment?
  - Tube must be small enough for adequate airflow.
  - Cuff takes up space in the airway.
  - Tube length may cause resistance to airflow.
  - Foam cuff is an absolute contraindication.

Routine and Emergency Procedures

- Suctioning
- Broncho-pulmonary Hygiene
- Oxygen and Humidity Therapy
- Trach Care/Stoma Care
- Inner Cannula Change Cleaning
- Oral Care
- Unplanned Decannulation
- Blocked Tube or Inner Cannula

Decannulation Plan

- Begins at Intubation-What is the Plan?
- Evaluation for Decannulation
  - Reason for tracheotomy has resolved
  - Medically stable
  - Patent upper airway
  - Tolerates speaking valve
  - Can manage oral and tracheal secretions
  - Tolerates capping/plugging
  - Risk of aspiration assessed
Airway Management Team

- "Tracheostomy expertise must follow the patient wherever they go in the hospital." Heffner, John E.
- Team Approach
  - Timing and tube selection
  - When to downsize
  - Plan of care
    - Communication
    - Swallowing
    - Decannulation
    - Impacts continuity of care
    - Impacts safety, length of stay and costs

Resources


Resources

- Heffner, J.H. Toward Leaner Tracheostomy Care: First Observe, Then Improve. Respir Care, 2009:50(12)

Resources

- www.Smiths-medical.com
- www.Cookmedical.com
- Cook Medical Inc., Bloomington, Indiana
- www.Premusa.com
- Premier Medical, Inc.
- Shiley Tracheostomy Pocket Guide: http://respiratorysolutions.covidien.com/LinkClick.asp?fileticket=AF0%2bTVa1%3d&tabid=184
- www.hopkinsmedicine.org/tracheostomy/about

Additional Educational Opportunities

- Self-study webinars available on demand
  - Getting Started
  - Ventilator Application
  - Swallowing
  - Pediatric
  - Special Populations
- Live group webinars
  - www.passy-muir.com
  - Passy-Muir Inc. is an approved provider of continuing education through ASHA, AARC, CMSA and California Board of Nursing Credit
Receiving CEU’s for this Course

- You will have 72 hours from the time this course ends to complete the evaluation, which is required to receive credit.
- Look in your email for a reminder link, or type this into your internet browser’s address bar:
  - ep.passy-muir.com
- You will need to submit a meeting code if you have not done so already.
- The meeting code for this meeting is: k357p19d

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