

Understanding Tracheostomy Tubes and Care

FROM INSERTION TO DECANNULATION

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Learning Objectives

- Review indications and hazards of trach tubes.
- Discuss insertion and insertion sites.
- Compare and contrast types of trach tubes.
- Examine trach and trach tube maintenance.
- Facilitating speech in trached patients.
- Weaning from trach tubes and decannulation.
- Review some cases.
- Provide add'l references.



INDICATIONS FOR TRACHEOSTOMY

- Relief of upper airway obstruction
- Prevention of laryngeal and upper airway damage due to prolonged intubation
- Prolonged mechanical ventilation (> 10 – 14 days)
- For easy or frequent access to the lower airway for suctioning and secretion removal
- Airway protection
- Refractory OSA with severe concomitant comorbidities



Benefits of Tracheostomy

- Decrease in ventilatory dead space
- Decrease in airway resistance & WOB
- Less need for sedation
- Faster weaning
- Increased patient safety and mobility
- Ease of tube replacement (for matured tract)
- Ability to communicate



Disadvantages & Hazards of Tracheostomies

- Complications at cuff site (e.g., tracheal stenosis)
- Requires specialized skill set, equipment personnel for insertion
- Stoma site bleeding and infection
- Mucosal drying and thickening of secretions
- Subsequent scar at stoma site

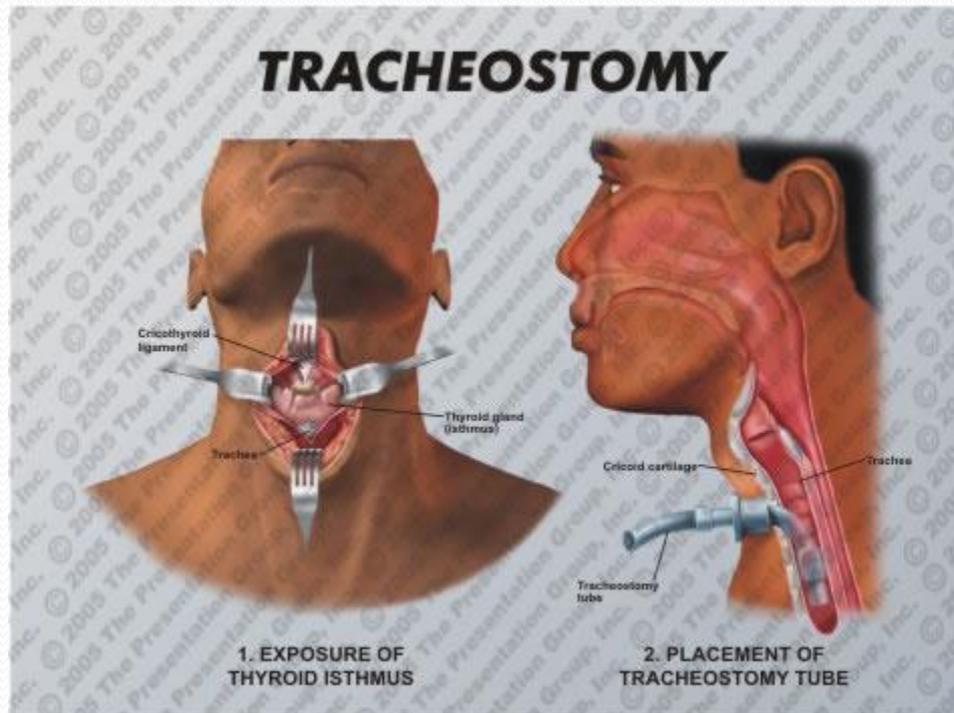


APPROACHES TO ESTABLISHING A TRACHEOSTOMY

- Surgical Tracheostomy tubes
 - typically placed above the 2nd to 4th tracheal rings
- Percutaneous Tracheostomy tubes
 - typically placed between the 1st and 2nd ,
or between the 2nd and 3rd tracheal cartilages



Insertion Site



Commonly Used Adult Trach Tubes

- Disposable inner cannula
- Cuffed (air-filled)
- Non-fenestrated
- # 8 mm ID (For Adults)



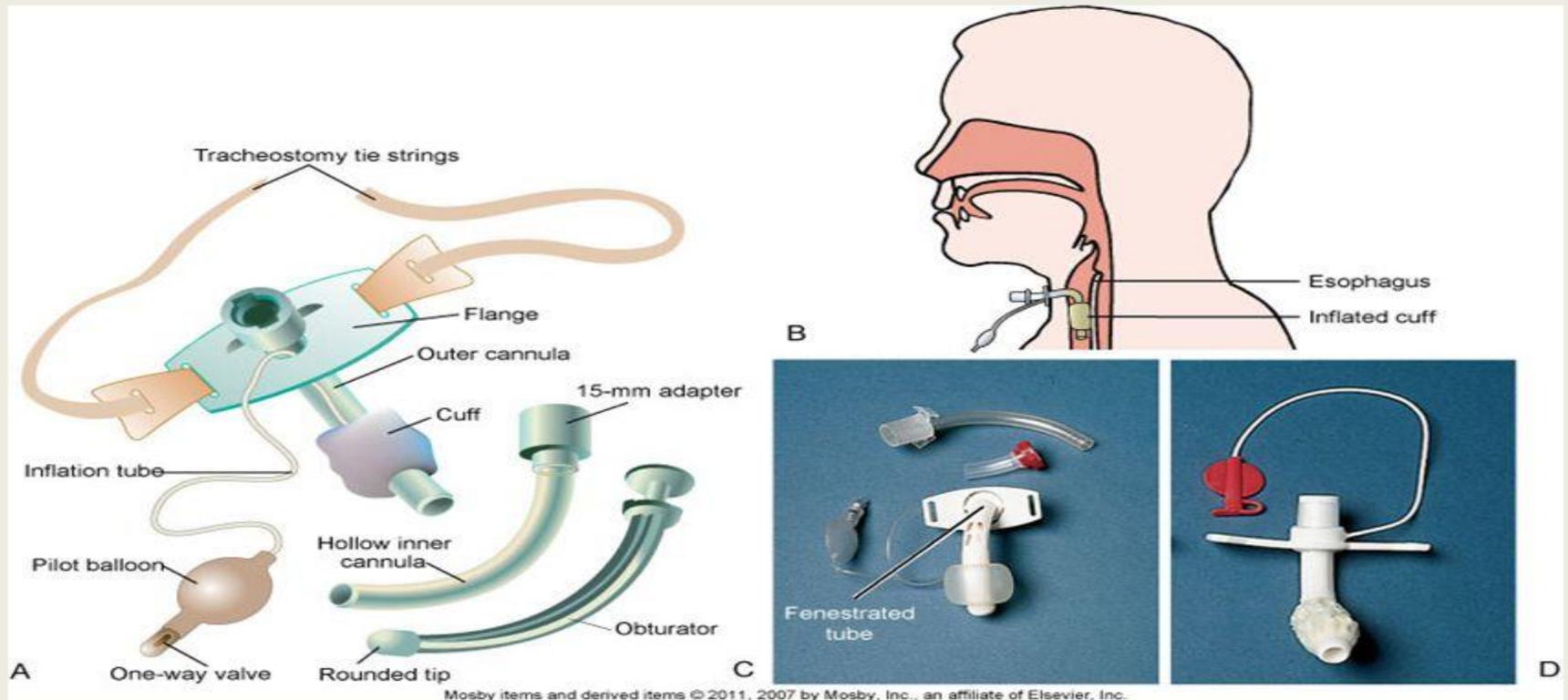
Variations in Trach Tubes

- Fenestration -- an opening in the outer cannula to facilitate speaking and spontaneous breathing.
- Non-disposable inner cannula -- require cleaning
- Foam or sterile water filled – for hyperbaric tx.
- Extra Long Trach Tube
- Cuff-less -- spontaneous breathing patients
- Tight-To-Shaft—For tight stomas
- Jackson (Metal tubes)—for very old trachs



Components

Parts of a Tracheostomy Tube



Types of tracheostomy tubes. **A**, Parts of a tracheostomy tube. **B**, Tracheostomy tube inserted in airway with inflated cuff. **C**, Fenestrated tracheostomy tube with cuff, inner cannula, decannulation plug, and pilot balloon. **D**, Tracheostomy tube with foam cuff and obturator (one cuff is deflated on tracheostomy tube).



Types of Tracheostomy Tubes



with
Disposable
Inner Cannula

Used to obtain a closed
circuit for ventilation



Cuffed Tube
with Reusable
Inner Cannula

Used to obtain a closed
circuit for ventilation



Cuffed Tube
with
Disposable
Inner Cannula

Used for patients with
tracheal problems

Used for patients who
are ready for
decannulation



Cont'd



Cuffed Tube with Reusable Inner Cannula

Used for patients with
tracheal problems

Used for patients who are
ready for decannulation



Fenestrated Cuffed Tracheostomy Tube

Used for patients who
are on the ventilator but
are not able to tolerate a
speaking valve to speak



Fenestrated Cuffless Tracheostomy Tube

Used for patients who have
difficulty using a speaking
valve



Shiley Trach Tubes & Initials

- DCT: Cuffed with disposable inner cannula
- CCFN: Cuffless with disposable inner cannula
- CFEN: Cuffed and fenestrated
- CFN: Cuffless with inner (non-disposable inner cannula)
- XLTCP: Extra long cuffed with disposable inner cannula

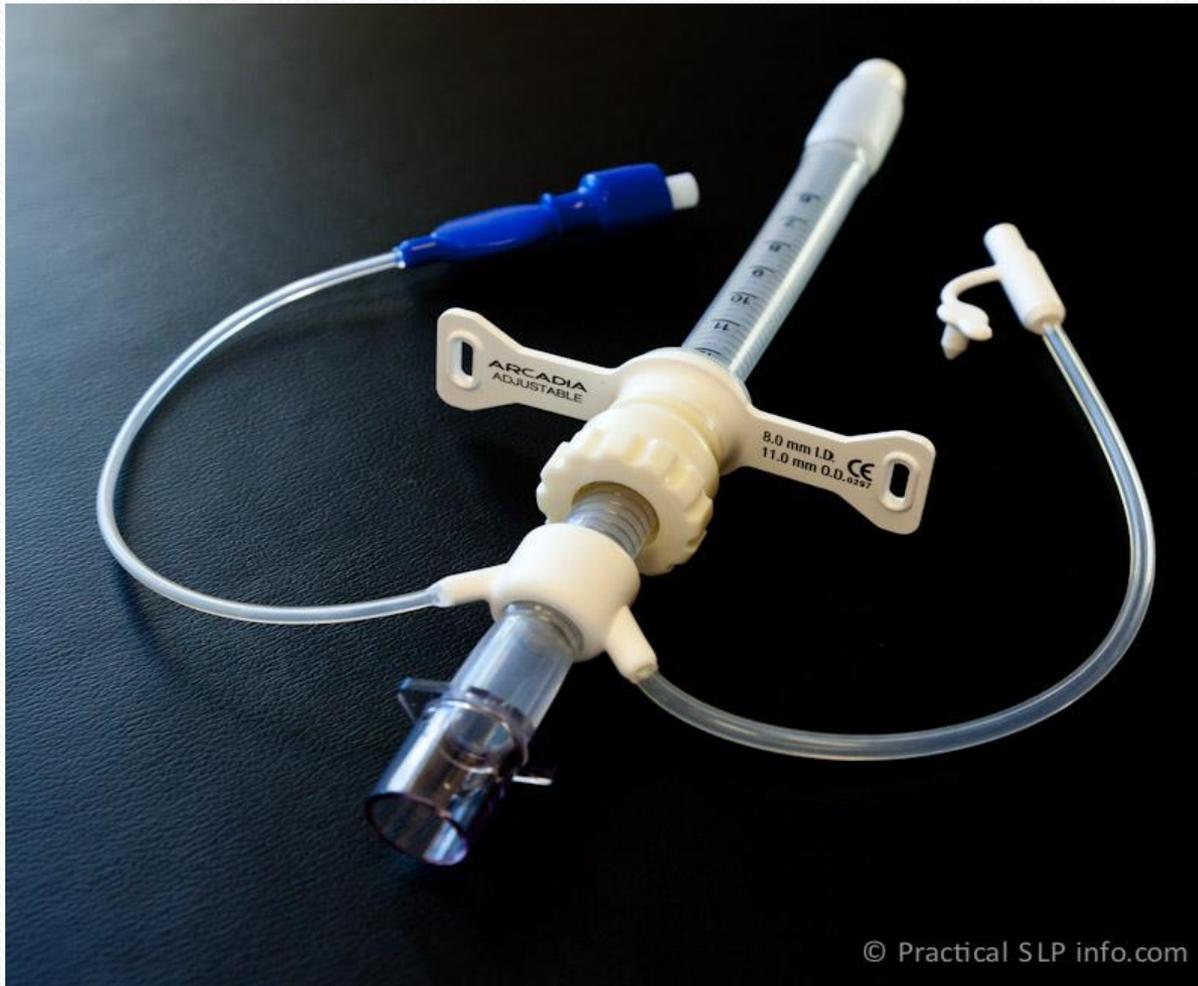


Bivona Fluid, Air and Foam Filled Tubes

Trach Tubes - Bivona



Tight-To-Shaft



Care & Maintenance

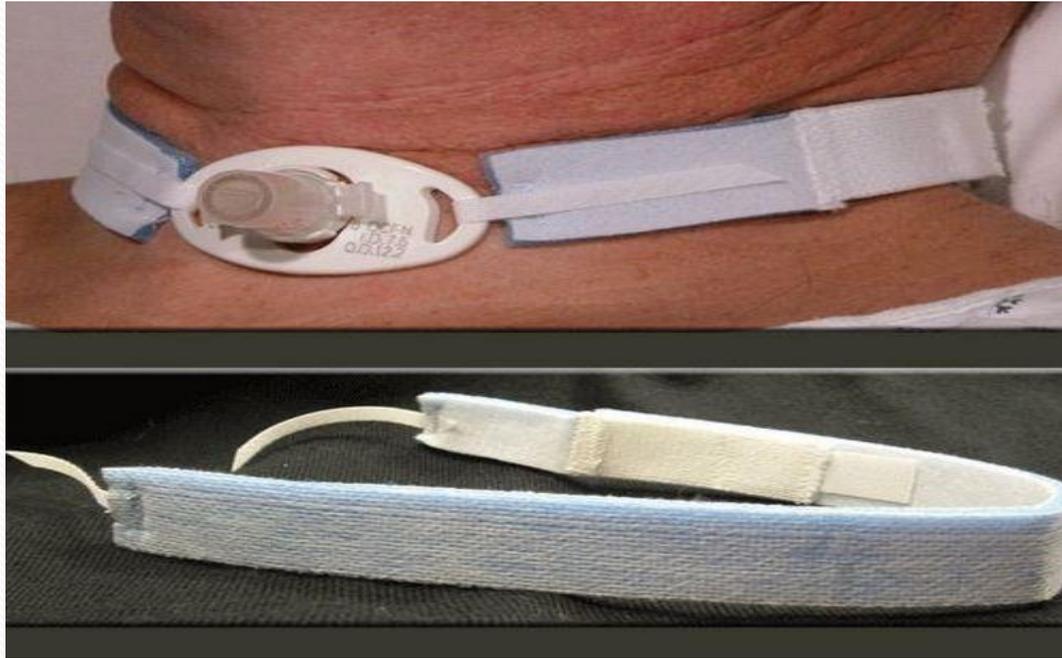
- Suture removal -- for new trachs. (As directed but not less than 48 hours)
- Cleaning around and under flange
- (Q8 hours)
- Inner cannula changes (Q 8 to 12 hours)
- Inner cannula cleaning (for non-disposable inner cannulas)
- Cuff pressure checks (Q 8 hours)
 - Cuff pressure should be maintained at: 20-25 mmHg (25-35 cmH₂O)
- When to deflate the cuff?
 - Trach Collar/T-Piece
 - Speaking
- Speaking Valves (PRN and as prescribed)
- Changing Trach tubes (every 2-4 weeks, unless downsizing)



Trach Tube and Cannula Cleaning Kit



Trach Tube Holders



Speech in Tracheostomized Patient

Facilitation of Speech (Not mechanically ventilated)

1. Talking tracheostomy tube
2. Cuff-down finger occlusion technique
3. Cuff-down with speaking valves



Speaking Valves—Generally, Cuff Must be Deflated, Unless (of Course) Uncuffed



- Changing The Tracheostomy Tube
 - Usually **straightforward** once the stoma is well formed.
 - Done about every 30 days.
 - Requires **trained personnel**.
 - First change is generally done by a trained physician.
 - Have a trach tube one-size smaller at bedside.
 - Person who is **skilled in intubation** must be on standby.



Responding To Emergencies—Mucous Plugging Inability to Ventilate

1. First, attempt to suction.
2. If suction catheter will not pass, consider introducing a bougie.
3. Remove and change inner cannula.
4. Decannulation is a last resort and only done if intubation personnel and equipment is at bedside.
5. Prevention is best with adequate humidification, suctioning and maintenance of adequate hydration.



Responding to Emergencies -- Accidental Decannulation

(Displacement)

- Decannulation before a mature tract is potentially disastrous.
- Rapid airway loss can occur **as the stoma closes.**
- **Blind reinsertion attempts** are at risk of going pretracheal, creating a “**False Passage.**” Subcutaneous emphysema, pneumomediastinum can occur.

Best Response (attempt in this order):

1. Attempt to re-insert same size tube (well lubricated)
2. Attempt to insert one-size smaller trach tube.
3. Insert an appropriate sized ETT into the stoma.
4. Call for help, cover the stoma and ventilate via mouth and await trained personnel.



Other Complications:

1. **Tracheomalacia** --softening of tracheal wall.
 - occurs prior to stenosis.
2. **Tracheal Stenosis** — Accounts for ½ of Complications.
3. **Tracheoesophageal Fistula**
 - Occurs in < 1% of patients undergoing tracheostomy
4. **Tracheoarterial Fistula (Erosion)**
 - One of the **most feared and lethal** complications
 - Massive bleeding and aspiration



Methods of Weaning (Prior to Final Removal)

1. Increasing periods of **cuff deflation**
2. Change to a **fenestrated tube**
3. Change to a **cuffless tube**
4. The use of **speaking valves** (deflate the cuff)
5. **Downsizing** of the tracheostomy tubes (8=>6=>4)
6. **“Cork”, or capping** of the tracheostomy tubes
= For non-fenestrated tube, deflate cuff
before capping (Not doing so results in a
complete airway obstruction)



Decision to Decannulate (Primary Method)

- Patient tolerates plugging overnight while asleep without O₂ desaturation.
Some patients need supplemental oxygen
- Subsequently, tube is removed > skin edges are taped shut > the stoma is covered with sterile dressing
- Wound should heal within 5-7 days



Case 1

- A 54 year old COPD patient has been intubated for 12 days and has failed successive spontaneous breathing trials. What would you recommend to the attending physicians regarding airways selection and why?



Case 2

- Why might the patient in the preceding slide wean better with a trach tube than an ETT in place?
- What other advantages might a trach tube afford this patient?



Case 3

- The patient in the preceding slides has a #8 DCT trach tube in place. What does DCT stand for?
- When would the initial sutures be removed and by whom?
- What sort of trach care would be done and how often would it be done?
- How often should a trach be changed if decannulation is not planned for the near-term?



Case 4

- The same patient has now been on a trach collar/T-Piece for 36 hours and is tolerating it quite well.
- What additional recommendations might you have regarding facilitating speech and eventual decannulation?



Take-Home Notes

- Trach tubes should be considered for patients intubated more than 10-14 days where extubation is not immanent.
- There are many types of trach tubes for different patients and conditions.
- Trach tubes (and their patients) require care and maintenance.
- When in doubt, ask the *Respiratory Therapist* for help.



Selected References

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Volsko TA, Parker SW, Deakins K, et al: AARC Clinical Practice Guideline: Management of Pediatric Patients With Tracheostomy in the Acute Care Setting. *Respir Care*. Jan;66(1):144-155, 2021.

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