

TRACHEOSTOMY:

(An Overview for the Multi-Disciplinary Team)

Presented By Bart Smith M.A.-CCC/SLP
Grant Medical Center

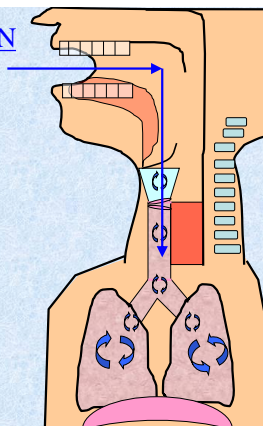
Authored by B. Smith 2016

What Therapists Need to Know About Respiration

NORMAL RESPIRATION

Inhalation

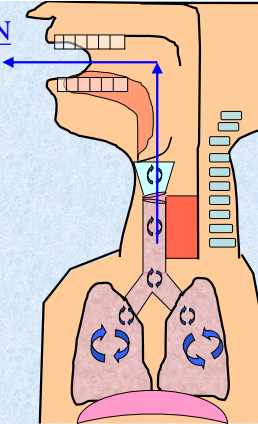
- Diaphragm contracts
– creating negative pressure
- Inter-costal muscles expand
- Rib cage expands in all three dimensions
- The lungs inflate, creating a positive pressure build-up



NORMAL RESPIRATION

Exhalation

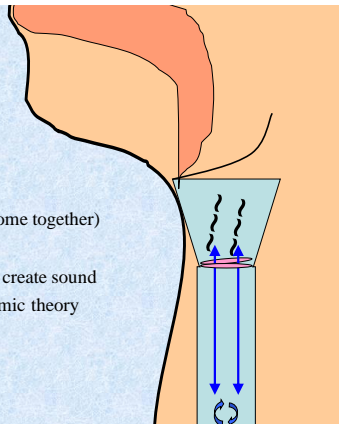
- Diaphragm relaxes
- Inter-costal muscles relax
- Rib cage collapses
- Airflow reverses its path
- Negative pressure is created



What Therapists Need to Know About Phonation

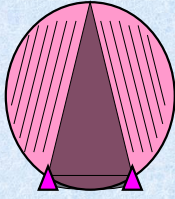
Normal Phonation

- Air is exhaled from lungs
 - up through the glottis
- The vocal folds adduct (come together)
- The vocal folds vibrate to create sound
 - Myoelastic-Aerodynamic theory
 - Bernoulli Effect

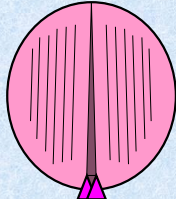


Normal Phonation

Vocal Folds
Abducted



Vocal Folds
Adducted





What Therapists Need to Know About
Tracheostomy

What is a Tracheostomy?

“**Tracheotomy, or tracheostomy**, is a surgical procedure which consists of making an incision (cut) on the anterior aspect (front) of the neck and opening a direct airway through an incision in the trachea (windpipe). The resulting stoma (hole) can serve independently as an airway or as a site for a tracheal tube or **tracheostomy tube** to be inserted; this tube allows a person to breathe without the use of the nose or mouth.”

* Taken From Wikipedia Definition for "Tracheostomy"

What is a Tracheostomy?

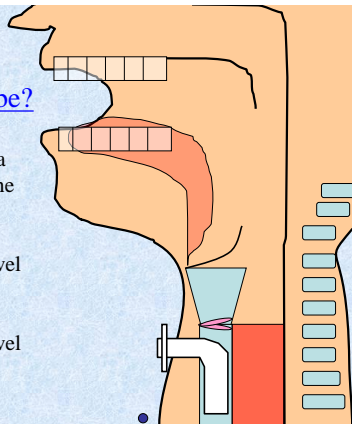
Rationale - To establish a patent airway

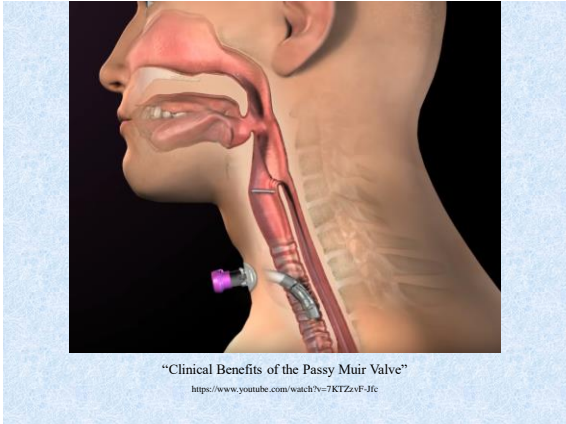
- otomy, -ostomy, -ectomy

Although “-ostomy” technically refers specifically to the surgical opening, the term **Tracheostomy** is also used to describe the procedure itself.

Where is a Tracheostomy Tube?

- Placed in the trachea below the level of the vocal folds.
- Placed below the level of the vocal folds.
- Placed below the level of the vocal folds





Who may need a Tracheostomy?

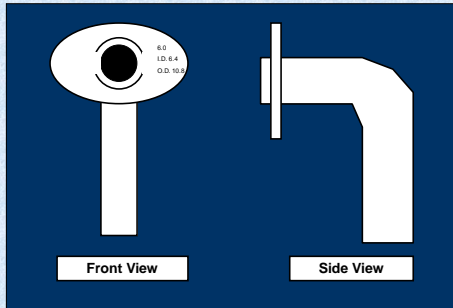
Patients with:

- Acute injury or insult to the brain
- Maxillofacial injuries
- Acute injury to head and/or neck
- Surgery to the head and/or neck
- Large tumors of the head and/or neck
- Need for long term mechanical ventilation
- Failed endotracheal intubation
- Contraindications for endotracheal intubation

What Therapists Need to Know About Tracheostomy Tubes



The Outer Cannula



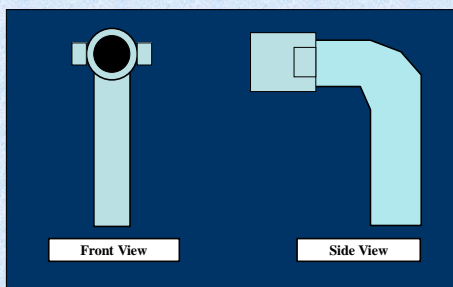
The Outer Cannula

Neck Plate

- Size
 - Brand Differences
- Inner Diameter
- Outer Diameter
- Neck Strap
- Fenestrations

Shiley Tracheostomy Tubes		
Size	I.D.	O.D.
4	5.0	9.4
6	6.4	10.8
8	7.6	12.2

The Inner Cannula



The Inner Cannula

Purpose

- Decreases frequency of deep suctioning
- Guards against granulation tissue
 - In fenestrated traches
- Fits snugly inside outer cannula
- Connects with clips to neck plate



The Inner Cannula

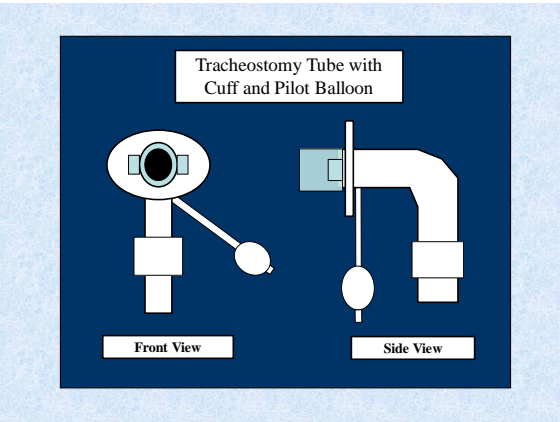
- Must be correct size to avoid a mucous plug
- Disposable - Changed twice a day minimum
- Make sure your patient has one in!
 - Especially with fenestrated traches







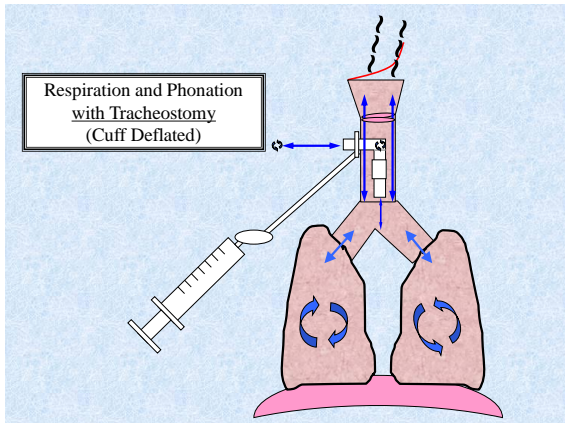
What Therapists Need to Know About
Cuffs and Pilot Balloons

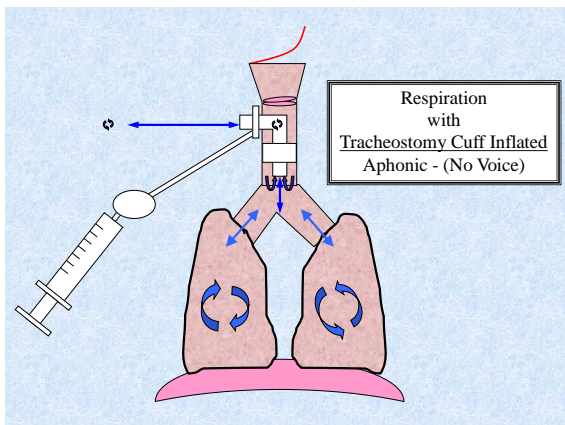


Cuffs and Pilot Balloons

Purpose

- To control all respiratory gasses
 - When inflated, the cuff redirects all airflow through the tracheostomy tube
- Necessary for mechanical ventilation

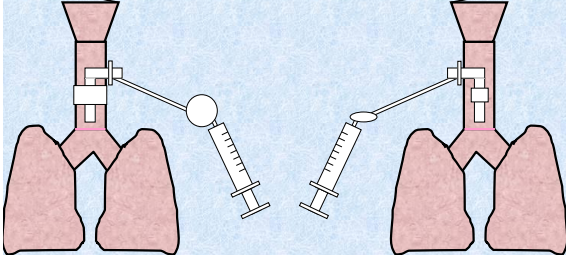


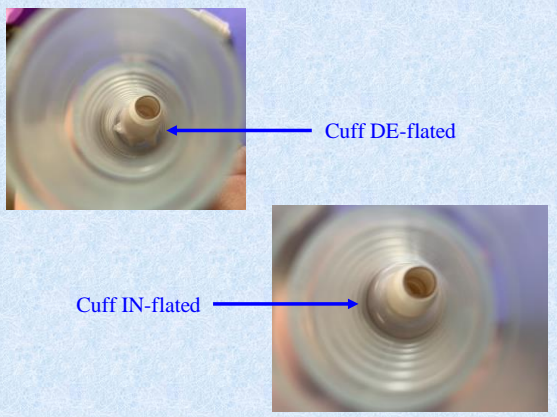


Rule of Thumb

Pilot balloon is inflated = Cuff is inflated

Pilot balloon is deflated = Cuff is deflated





Cuffs and Pilot Balloons

What Therapists Need to Know

- Patients not on ventilation do NOT need cuff to be inflated.
 - Limits airway
 - Reduces possibility of voicing

What Therapists Need to Know About Fenestrations



Fenestrations

- Small windows on the posterior aspect of the outer cannulas of some tracheostomy tubes

Purpose

- To allow air to pass through the tracheostomy tube, as well as around
- Increases airflow into upper airway
- Increases the possibility for voicing

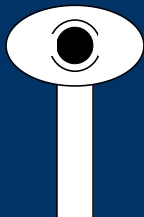


Rear View

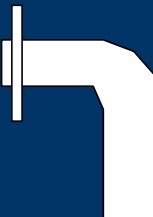


Side View

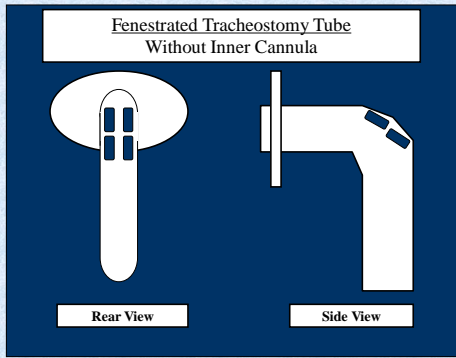
Non-fenestrated Tracheostomy Tube

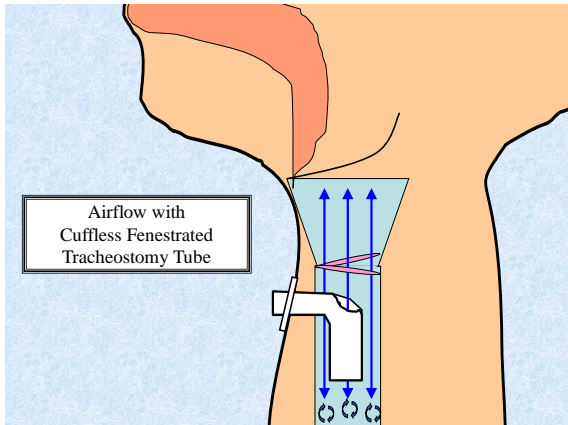


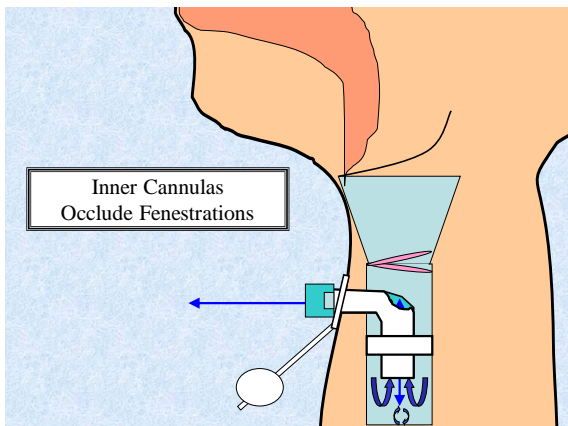
Front View



Side View



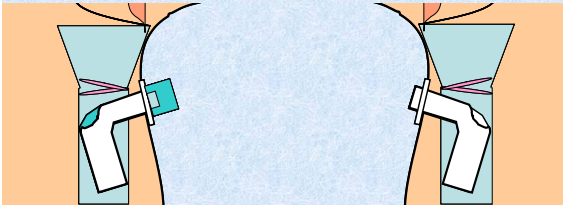




What Therapists Need to Know About Granulation Tissue

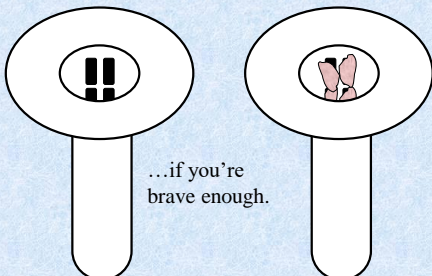
Granulation Tissue

- Tissue that is close to or abutting the fenestrations may begin to grow into them
- Will cause difficulty inserting inner cannula
 - Bright red blood
- Develops quickly, especially without inner cannula.



Anterior View of Fenestrations

Granulation tissue is frequently visible to the naked eye





Granulation Tissue

- Obscures the airway - strident breathing
- Inner cannula prevents granulation from developing
- Tracheostomy tube will frequently need to be replaced or downsized
- A Jackson tracheostomy tube may be necessary



Jackson Tracheostomy Tube

- Stainless Steel
 - Will not adhere to tissue
- Is not disposable
 - Requires special cleaning at least twice a day with sterile kit
- More sensitive to cold temperatures
- Problematic for Speech Valves



Cuffs and Pilot Balloons

What Therapists Need to Know

- Pilot balloons should not be over-inflated
- Over-inflated cuffs contribute to tracheal herniation
- Torn-off pilot balloons cause very few problems, but will make a difference for some.



Can you eat with a trache?

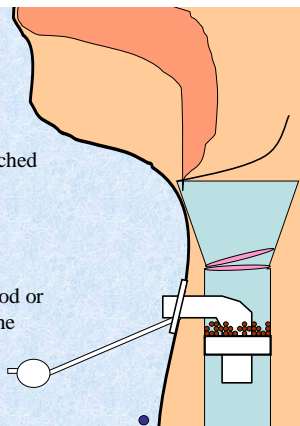
Yes. Yes, you can.

- Inflated cuffs **DO NOT** prevent aspiration!

- Food or liquid that has reached the top of an inflated cuff has already been aspirated

Reminder

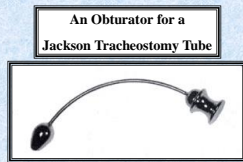
- Aspiration occurs when food or liquid passes the level of the vocal folds



What Therapists Need to Know About
Obturator

Obturator

- Used only for insertion of tracheostomy tube
- Often taped to the wall above the patient's bed, in case of accidental decannulation
- Do NOT leave in place!



What Therapists Need to Know About
Respiratory Issues Affecting Therapy

Respiratory Issues

Thickened Secretions

- Loss of humidification
- Loss of filtration system
 - Particles in the air mix with thin secretions

Trache mask should be worn

- Humidification keeps secretions thin

Increased risk of infection

- As with any surgical opening
- Patient contamination



Respiratory Issues

Decreased Conservation of Oxygen

- Inability to constrict airway or restrict airflow for physical activity

Cannot conserve air for:

- Lifting
- Pushing
- Bearing down
- Exerting pressure
- Standing
- Bowel Movements



What Therapists Need to Know About Communication Issues And Speech Therapy

Communication Issues

APHONIA

- Absence of speech
 - Most likely due to altered airflow
 - Absence of airflow to vocal folds

Leak speech

- The ability to voice around the tracheostomy tube independently

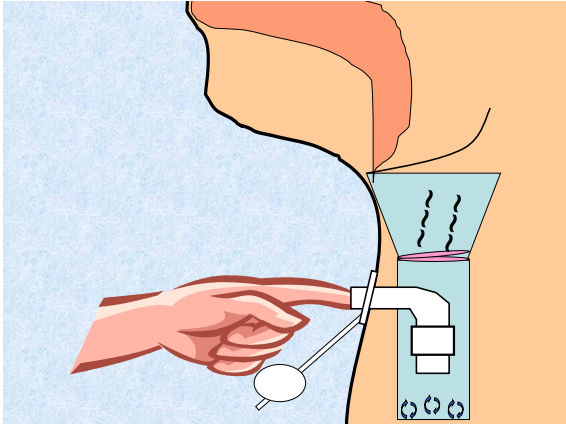
Communication Issues

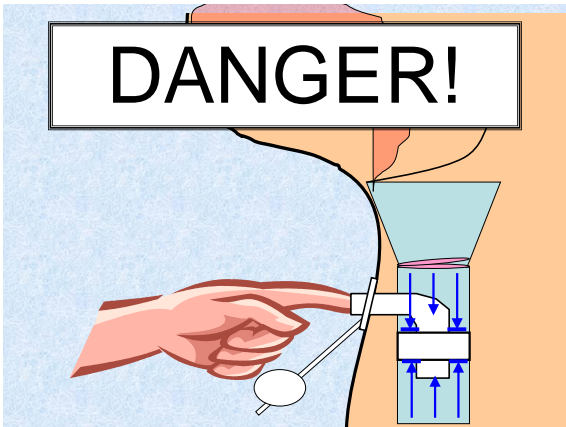
Finger occlusion

- Placing the tip of a finger over the tracheostomy tube opening
- Assesses airflow capabilities for both inhalation and exhalation

Steps to Perform Finger Occlusion

1. Deflate cuff
 2. Have patient take deep breath in
 3. Place finger over tracheostomy tube
 4. Have patient attempt voicing
- This will lessen the “Fear Factor”!





The #1 Rule of Tracheostomy

If you are going to occlude the tracheostomy tube for ANY length of time, make certain that the cuff is DEFLATED!

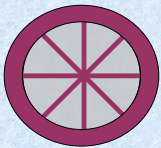
What Therapists Need to Know About Speaking Valves

Passy-Muir Speech Valve (PMSV)

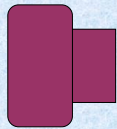
- One way air flow
- Fits on end of Inner Cannula
- Allows airflow into Tracheostomy Tube
- Disallows airflow back through Tracheostomy Tube
- Airflow redirected into upper airway, allowing vocal folds to vibrate



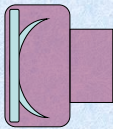
Passy-Muir Valve



Front View

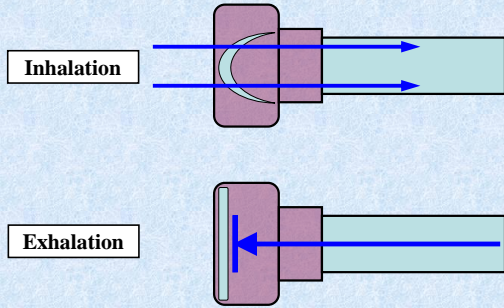


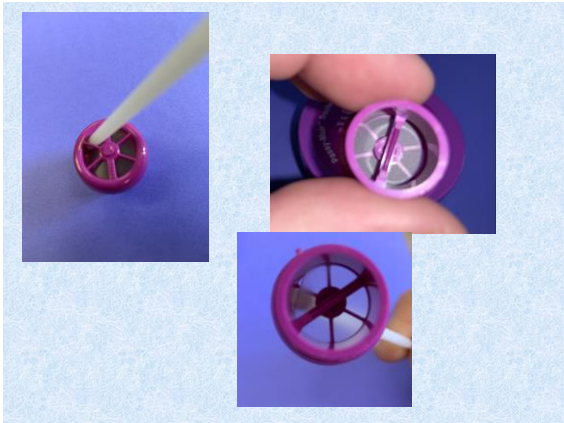
Side View

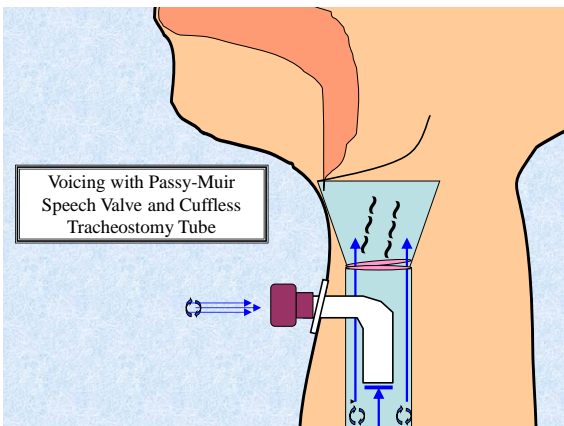


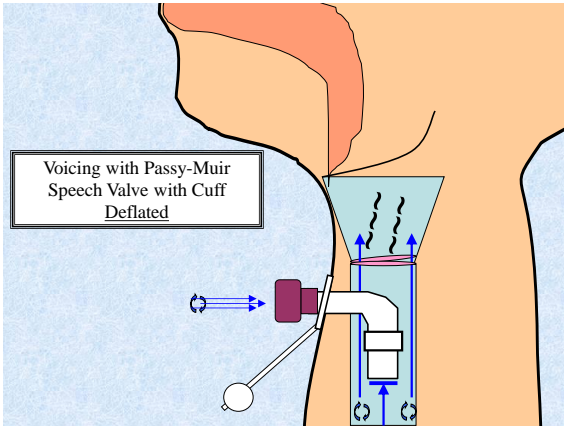
Interior View

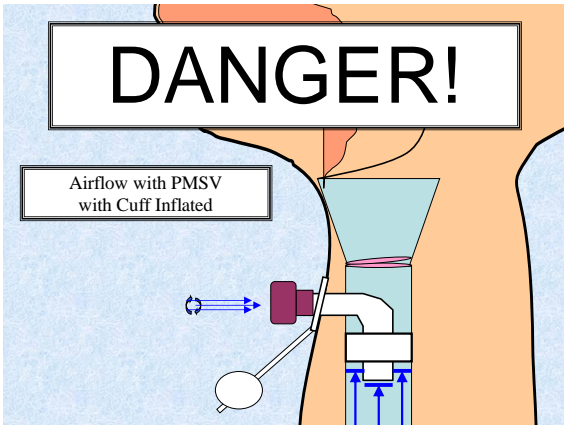
Airflow with the Passy-Muir Valve











What Therapists Need to Know About
Speaking Valves and
Mechanical Ventilation

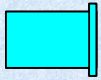
Ventilators and Passy Muir Valves

In-line PMSVs

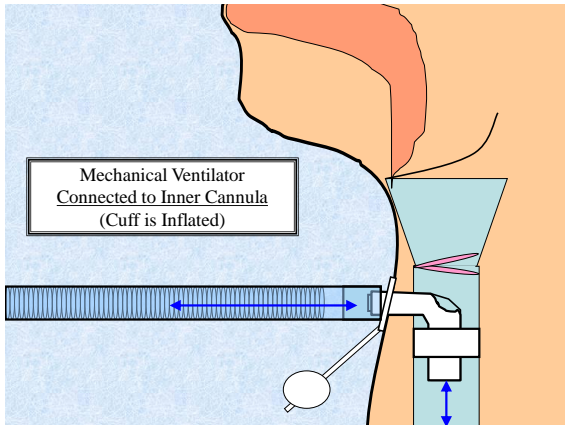
- Connect to oxygen tubing
- Same exact function as purple valve
- Can be used with ventilator
 - Difficult in this setting
 - Requires a respiratory therapist present

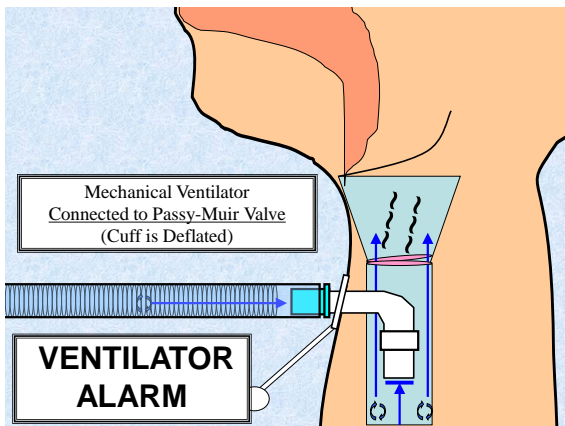


Front View



Side View





What Therapists Need to Know About Speaking Valve Safety

Passy-Muir Valve

AIRFLOW DANGERS

- Patients who are unable to move air around tracheostomy tube will not tolerate PMSV
 - Patient will be able to inhale, but not exhale
- Fenestrations will be of no benefit
 - Obstructed by Inner Cannula, which is required for attachment of the PMSV

Passy Muir Valves

Airway Obstruction

- Likely to occur when:
 - Cuff is inflated
 - Tracheostomy Tube is too large
 - Area surrounding tube is obstructed
 - Dried blood
 - Thick mucous
 - Edematous tissue
 - Tracheal stenosis

What Therapists Should Know

Trache mask should be worn over PMSV

- Humidification keeps secretions thin

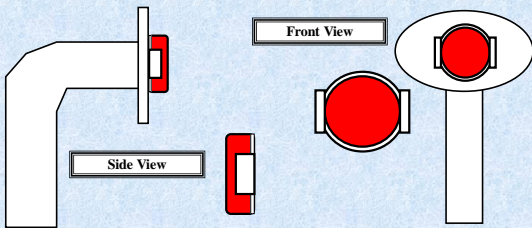
Passy-Muir Speech Valve should be cleaned daily

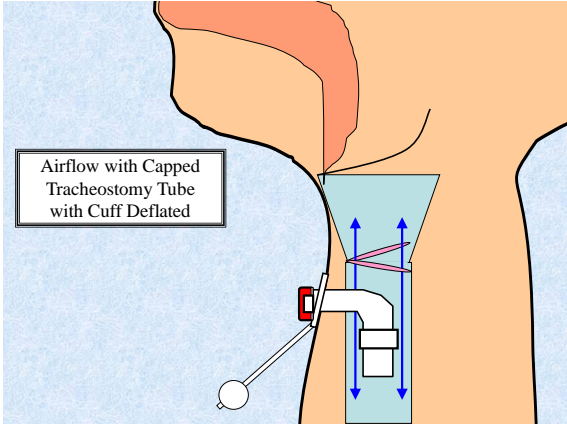
- Warm soapy water (not hot water)
- Dye-free, perfume-free ivory liquid soap
 - from Speech Therapy
- Rinse thoroughly
- Leave in open cup over night to dry

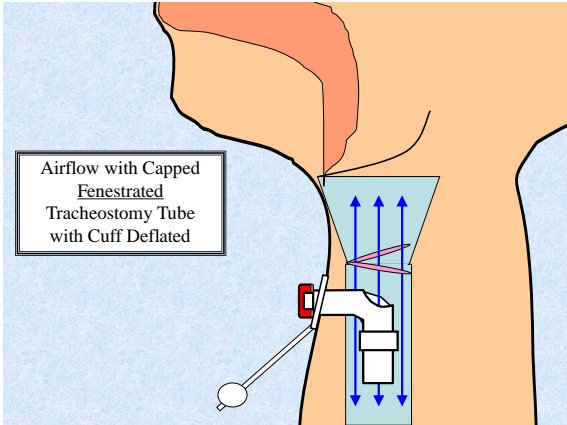
What Therapists Need to Know About Tracheostomy Caps

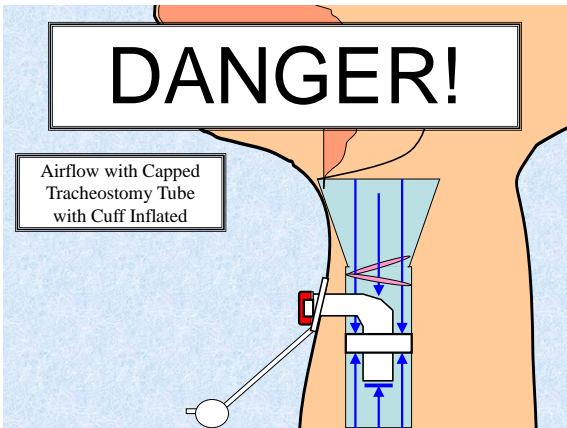
Tracheostomy Caps

- Attaches directly to the tracheostomy tube
 - Inner Cannula must be out
- Completely obscures the tracheostomy tube
- Restore “normal” airflow









The #1 Rule of Tracheostomy

If you are going to occlude the tracheostomy tube for ANY length of time, make certain that the cuff is

DEFLATED!

Tolerating Occlusion

(PMSV or Capping)

- Many people have to build up their tolerance
 - Monitor constantly at first
 - Monitor intermittently over time
- Oxygen Saturation levels
 - Greater than 90%
- Vitals
 - Heart Rate
 - Respiratory Rate

Tolerating Occlusion

(PMSV or Capping)

- Secondary signs of poor tolerance
 - Diaphoresis
 - Shortness of breath
 - Stridor
 - Struggling
 - Strong burst of sub-glottic air when PMSV or cap is removed

Can you eat with a trache?

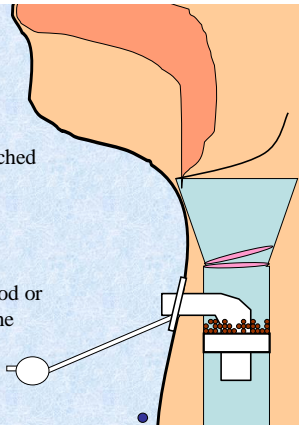
Yes. Yes, you can.

- Inflated cuffs **DO NOT** prevent aspiration!

- Food or liquid that has reached the top of an inflated cuff has already been aspirated

Reminder

- Aspiration occurs when food or liquid passes the level of the vocal folds



CLINICAL BENEFITS OF THE PASSY-MUIR® VALVE

- Improved Voice/Speech
- Improved Smell & Taste
- Improved Swallow
- May Reduce Aspiration



“Clinical Benefits of the Passy Muir Valve”

<https://www.youtube.com/watch?v=7KTZa1F-Jfc>

What Therapists Need to Know About
Downsizing / Decannulation

Downsizing / Decannulation

Downsizing / Decannulation protocols

- Will vary between physicians
- Patient specific
- Highly dependent on general medical and respiratory status

Downsizing / Decannulation

General Downsizing / Decannulation Protocols

- 7-14 days (2 weeks generally preferred)
- Generally will change from #8 tube to a #6 tube (fenestrated if possible)
- At least a #6 tube before decannulation

Downsizing / Decannulation

Capping / PMSV Protocol

- Patient tolerates trache mask for at least 4 hours
- Usually receives speech consult
- PMSV may be placed 48-72 hours after tracheotomy
- PMSV may be delayed 48-72 hours after downsizing
 - Swelling
 - Bronchospasm

Downsizing / Decannulation

Contraindications for Decannulation

- Wired jaw
- Granulation
- Stenosis
- Inability to manage secretions

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Thank YOU for Attending!

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