Managing Patients with Tracheostomy Tubes: ENT and SLP Perspective

David Francis, MD
Carmin Bartow, M.S. CCC-SLP, BCS-S

ENT slides will not be posted

SLP Perspective

Communication Options
Swallowing Evaluation and Treatment
Disclosures

Financial Disclosures
- Receive speaking fees from Passy-Muir, Inc. However, no remuneration from Passy-Muir for this presentation

Nonfinancial Disclosures
- No nonfinancial relationships to the content of this presentation

Role of the SLP
- Communication evaluation and treatment
- Swallowing evaluation and treatment
- Advocacy
- Member of a tracheostomy team
- Patient / family education
- Staff education and collaboration

Why is communication difficult?
Communication Options

- Nonverbal
  - Writing
  - AAC
  - Communication board
  - Mouthing
  - Texting
  - Phone apps
  - Tablets

- Verbal
  - Leak speech
  - Speaking valves

- Verbal options for vent dependent patients
  - Talking trach
  - Blom Trach System
  - Passy-Muir in-line with the ventilator
Leak Speech

- Ability to produce voice with airflow “leaking” around a trach tube into upper airway
- Occurs most often with cuffless tubes, deflated cuffs, or fenestrated trachs
- Airflow takes path of least resistance through trach tube, typically making speech breathy and weak

Leak Speech Video

Speaking Valves

- One way valves that are closed during exhalation
- Allows airflow to pass through vocal folds for phonation
Patient Criteria

- Awake and alert
- Medically stable
- Able to tolerate cuff deflation
Can the patient exhale around the trach and through the upper airway?

How to assess:
- Educate the patient and family
- Position the patient and trach appropriately
- Slowly deflate the cuff
- May need to suction after deflating the cuff
- Briefly finger occlude the trach during exhalation
- Listen for exhalation and/or phonation

Results of finger occlusion trial
- Voicing or exhalation through mouth and nose
  Proceed with speaking valve placement
- Not able to phonate or exhale through mouth and nose
  Do not proceed with speaking valve placement

Considerations if unable to exhale through upper airway:
- Sizing of trach tube – the #1 issue
  - Ideal size of trach is 2/3 size of tracheal lumen
  - May require downsizing
- Upper airway edema/obstruction
- Granulation tissue
- Foam-filled cuff
- Partially inflated cuff
- Secretions
Valve Placement

- Order from MD required
- Educate patient and family
- Obtain baseline measurements:
  - Oxygen saturation
  - Respiratory rate
  - Heart rate
  - Color
  - Work of breathing
  - Responsiveness
- Suction patient if needed

Can the SLP suction?

- ASHA’s Code of Ethics states that clinicians must be competent by virtue of training, education, and experience to perform any activities. Thus, appropriate training and support is necessary for SLPs to undertake any activity at which they are not already competent. It is advisable for every facility to develop a written policy that addresses the level of involvement and training that SLPs will have as well as a mechanism for verifying competency.
- Some states limit the SLPs from suctioning. It is best to check with the state board to ensure that there is no violation of licensure laws or practice acts.

Valve Placement

MUST DEFLATE THE CUFF
Deflating a Cuff

- Deflation - to make sure the cuff is fully deflated, continue to remove air until resistance is met

Inflating a Cuff

- Inflation - an over-inflated cuff can result in damage to the tracheal walls
- Recommended cuff pressure is approximately 20-25 mmHg

Valve Placement

- Place with a gentle twist to secure it to the hub of the trach
Allow patient to adjust to airflow change
Continue education and reassurance
Establish phonation
Continue to monitor for any changes from baseline measurements
Remove valve if any significant changes occur

Decreased O2 with cuff deflation – may need to increase FiO2 (must check with RT)
Inadequate exhalation/phonation
  - Check for:
    - Complete cuff deflation
    - Trach tube size
    - Suctioning needs
    - Need for MD assessment
    - Patient position
    - Trach position
Contraindications

- Patient cannot tolerate cuff deflation
- Foam cuff
- Severe airway obstruction
- Trach tube is too big to allow airflow around tube into the upper airway
- Laryngectomy

Session Wrap-Up

- Wear times vary
- Confer with medical staff as needed
- Post warning labels
- Storage
- Care and cleaning
- Sleep – on or off?

Benefits of the Passy-Muir Speaking Valve (Closed System)

- Improved voice
- Improved cough and secretion management
- Improved physiologic PEEP
- Improved swallowing (will discuss during swallowing section)
- Expedites vent weaning and decannulation
- Restores upper airway sensation
- JCAHO compliance – all patients have the right to communicate in the least restrictive and most natural manner
- Reduce patient anxiety
- Improved quality of life

(Light et al., 1989; Dettelbach et al., 1995; Stachler et al., 1996; Elpern et al., 2006; Suter et al., 2003; Byrick, 1993; Fukumoto, 2006)
Communication Options for Vent Dependent Patients

- Leak speech
- Passy–Muir in–line with the ventilator
- Talking trach tubes
- Blom Trach System

(No time to cover today…come back next year 😊)
Do trachs cause dysphagia?

- YES!
- NO!
- Maybe?

Questions have long surrounded the relative role of the tracheostomy in the initiation and exacerbation of swallowing dysfunction

Let’s take a look at the research...

Potential effects on swallow

- Decreased laryngeal sensitivity (Feldman et al., 1966)
- Reduced laryngeal elevation (Elpern et al., 1994; Bonanno, 1971)
- Dysfunction of vocal fold closure
  - Decreased vocal fold adduction duration during swallow (Buckwalter & Sasaki, 1984)
- Disuse atrophy of larynx (Davis & Thompson Stanton, 2004)
- Lack of efficient protective cough
  - Decreased effectiveness to clear secretions from upper airway (Bailey, 2005)

Potential effects on swallow

- Loss of normal pressure and airflow relationships
  - When subglottic pressure is altered, neuroregulation of pharyngeal swallow physiology is likewise altered (Gross et al., 2003)
- Aspiration
  - 50–83% of patients with trach tubes aspirate (Cameron et al., 1973; Elpern et al., 1994; Tolep et al., 1996)
  - 75% silent aspiration (Donzelli et al., 2006)
However....

- Most research citing trachs as cause of dysphagia do not consider swallowing ability prior to tracheotomy and demonstrate inconsistent results regarding altered swallow physiology.
- "...there is growing evidence that chronicity and severity of underlying illness, comorbidities, and recent intubation are the major arbiters of dysphagia in this patient population." (Francis & Gelbard, 2014)

Many Trach & Vent Patients...

- Exhibit neurological disorders with associated neuromuscular impairment (Murray & Brzozowski, 1998)
  - Stroke, TBI, Parkinson’s, ALS, etc.
- Demonstrate advanced age and decreased functional reserve (Elpern et al., 1994; Leder, 2002)
- Present with significant respiratory problems
  - Swallowing requires synchronization of respiration with swallow (Simão et al., 2009)
  - Linked to weakness and fatigue (Murray & Brzozowski, 1998)

Many Trach & Vent Patients...

- Experience intensive medical intervention linked to iatrogenic causes of dysphagia (Murray & Brzozowski, 1998)
  - Use of medications (i.e., general sedatives, neuromuscular blocking agents)
  - Altered mental status
  - Glottic injury from previous translaryngeal intubation (i.e., v/f paralysis, laryngeal edema, ulceration) (Tolep et al., 1996)
  - 50% of patients with prolonged intubation experience dysphagia
  - 25% of those patients have silent aspiration
Dysphagia and silent aspiration are frequent in tracheostomy/mechanical ventilation patients.

Cause is likely multifactorial.

No conclusive evidence that tracheostomies are the sole cause of dysphagia.

Some conditions associated with trach tubes (i.e., depressed cough and laryngeal atrophy) may exacerbate swallowing dysfunction in certain patients (Matthews, 2010).

Must individualize evaluation and treatment for each patient.

Dysphagia Management

> Evaluation

> Treatment

Assessment

> Clinical bedside assessment with or without blue dye

> FEES

> VFSS
Clinical Bedside Swallowing Assessment

› Medical history
  ◦ Diagnosis
  ◦ Past medical history
  ◦ Physical, medical, and nutritional status
  ◦ Underlying pulmonary disease
  ◦ H/o dysphagia
  ◦ Type of trach tube
  ◦ Mechanical ventilation
  ◦ H/o endotracheal intubation

› Oral mech exam
  ◦ What you see here is often c/w what is going on in the pharynx / larynx

Clinical Bedside Swallowing Assessment

› Deflate cuff (if cannot deflate cuff, proceed with instrumental assessment if possible)
› Suction as needed
› Place speaking valve, if present

Clinical Bedside Swallowing Assessment

› Begin po trials with or without blue dye
  ◦ Blue dye test
  ◦ No set standards; varies from facility to facility
  ◦ Involves use of blue food coloring to dye secretions, liquids, or foods
  ◦ Tracheal secretions that are either coughed or suctioned from trach are monitored for signs of aspiration
Clinical Bedside Swallowing Assessment
- Dysphagia observations
- Observe for s/s of aspiration
  - Vocal quality
  - Cough
  - Evidence of aspiration in tracheal secretions (immediate and delayed assessment)

The Blue Dye Dilemma
- False negatives
  - 50% false negative error rate when compared to VFSS and FEES; microaspiration not detected with blue dye test (Donzelli, 2001; Brady et al., 1999)
- Potential systemic effects
  - In 2003 FDA issued a public health advisory re: use of blue dye in tube feedings; resulted in blue dye being pulled from the market
  - No adverse reports published re: use of small amounts of blue dye in swallow evaluation
- Limitations
- Use results cautiously

VFSS/FEES
- Objective results
- Can be performed on vent and non-vent patients
- Identifies etiology of aspiration (not just presence of aspiration)
- Can implement therapeutic maneuvers and strategies
**Instrumental Assessment**

- Need to be sure to assess patient in the condition in which he/she will eat
  - Cuff up
  - Cuff down
  - Valve on
  - Valve off

**Swallowing While On the Vent**

- 66% of patients swallowed successfully; no aspiration
- Of the patients that did aspirate (33%), 80% was silent aspiration (Leder, 2002)

What does this tell us?
- MANY patients can eat even when on the vent
- Need for instrumental assessment for our vent-dependent patients

**Treatment**

This is the goal!
Oral Hygiene

- Considerable evidence exists to support a relationship between poor oral health, the oral microflora, and bacterial pneumonia, especially ventilator-associated pneumonia in institutionalized patients.
- A number of studies have shown that the mouth can be colonized by respiratory pathogens and serve as a reservoir for these organisms. Other studies have demonstrated that oral interventions aimed at controlling or reducing oral biofilms can reduce the risk of pneumonia in high-risk populations. Taken together, the evidence is substantial that improved oral hygiene may prevent pneumonia in vulnerable patients.

Rehabilitative Swallow Therapy

- Do something!
  - Our trach patients are often our most medically fragile high risk population
  - They often aspirate
  - They may not be ready for a po diet
  - BUT we have to do something or swallow function may continue to decline
  - Ice chips
  - Exercise
  - Reassess frequently
Rehabilitative Swallow Therapy

General tips:
- Most traditional swallow exercises and adjunctive rehabilitative therapy, such as use of the IOPI and/or sEMG biofeedback, are fine to use with trach patients
- **Probably should not do Shaker with this population**
- Mendelsohn – don’t do it if it causes pain
- Breath holding techniques like the supraglottic won’t work with open trach

Compensatory Strategies and Diet Modifications

Same as non-trach/non-vent-dependent patients
- Compensatory strategies such as head turns, chin tucks, reduce bolus size, multiple swallows, etc.
- Diet modifications such as texture changes, thickened liquids, etc.

Restoration of a Closed System

- Decannulation
- Plug
- Passy-Muir valve
Swallowing With a Closed System

- Majority of research states that occluding the tracheostomy eliminates/reduces aspiration (Stachler et al., 1996; Gross et al., 1994; Bonanno, 1971; Dettelbach et al., 1995; Buckwalter & Sasaki, 1984; Elpern et al., 2000)

Benefits of Occlusion

- Allows airflow through upper airway (Suiter et al., 2003; Seidl et al., 2005; Prigent et al., 2012)
  - Improved laryngeal sensation
  - Improved airway protection (Dettelbach et al., 1995)
  - Improved cough; helps expel materials from the airway (Prigent et al., 2012)
- Restores subglottal pressure (Stachler et al., 1996)
  - Aids neuroregulation of swallow (Gross et al., 2003)
  - Associated with faster bolus transport time (Eibling & Gross, 1996)
- Requires deflation of cuff (Suiter, 2005)
  - Some research suggests may aid laryngeal elevation and swallow function (Suiter et al., 2003; Feldman et al., 1966; Ding & Logemann, 2005)

So, Best Case Scenario for swallowing...

- Cuff down
- Trach closed – speaking valve or cap
Tracheostomy Team
Complex aerodigestive patients
Dysphagia management
- SLP – compensatory and rehabilitative
- ENT – medical / surgical
- Tracheostomy management

Tracheostomy tubes can have adverse effects on communication and swallowing
These deficits can have a profound impact on quality of life and if not properly managed can result in long-term complications
Speech-language pathologists take the lead role in remediating speech and swallowing impairments and should play an integral role in the interdisciplinary team managing these patients