

Voice and Swallowing as it Relates to Brain Injury

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SMALL STEPS. GIANT STRIDES.

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Objectives

- 1. Will understand the possible voice impairments following a brain injury.
- 2. Will understand the possible swallowing impairments following a brain injury.
- 3. Will identify the importance of treating voice in dysarthric speakers.
- 4. Will identify when to consult a speech-language pathologist and/or an ENT/instrumental assessment.

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Voice

- Anatomy
- Dysphonia
- Assessments
- Voice impairments
- Treatment options



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Dysphonia

- The auditory-perceptual symptoms of voice disorders.
- Dysphonia is characterized by
 - o Altered vocal quality
 - o Pitch
 - o Loudness
 - Vocal effort



Perceptual voice qualities

- rough vocal quality *
- breathy vocal quality *
- strained vocal quality *
- abnormal pitch
- Abnormal loudness/volum e *
- abnormal resonance aphonia
- phonation breaks
- gurgly/wet-sounding voice
- pulsed voice
- tremorous voice

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Patient Reported Outcome Measures Patient-reported outcome measures (PROMs) are tools used to assess a patient's health status, symptoms, and overall quality of life from their own perspective. Pros Cons • Subjectivity Direct Insight into the • Limited Patient's Perspective Standardization Improved Patient- Data Interpretation Provider Communication • Patient-Centered Care CONFIDENTIAL 8

Patient Reported Outcome Measures

- Voice Handicap Index (VHI)- 30 statements
- Ex. My voice makes it difficult for people to hear me.



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Instrumental Assessments

 Nasoendoscopy • Flexible scope







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Instrumental Assessments

Videostroboscopy

Rigid scope •





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Important

Speech Language Pathologist can't diagnose voice impairments. If we complete an instrumental assessment and we view abnormalities and/or excrescences, we refer to the ENT for further assessment and diagnosis.

Ex. We complete an instrumental assessment, and we view a vocal fold that is not moving, we can't diagnosis a paralyzed vocal fold. Our next step would be to refer to an ENT so they can further assess and make that diagnosis.



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Voice impairments

- Spasmodic dysphonia
- Vocal fold dysfunction
- Vocal tremor
- Vocal fold paralysis
- Vocal fold paresis (weakness)
- Muscle tension dysphonia
 - Compression/hyerfunction



Paralyzed Vocal Fold



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False vocal fold compression



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Treatment options

- Vocal hygiene
- Traditional voice therapy (i.e. large amplitude voicing)
- Lee Silverman Voice Treatment (LSVT)
- Voice relaxation exercises
 - Stretches
 - Straw exercises
 - Cup blowing exercises
 - Stretch and flow exercises
- Laryngeal massage
- Laryngeal adduction
- ENT procedure



Dysarthria

- Types of dysarthria
- Related voice characteristics
- Examples



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"Dysarthria happens when the muscles used for speech are weak or are hard to control. Dysarthria often causes slurred or slow speech that can be difficult to understand."

-Mayo Clinic

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Types of Dysarthria

- Flaccid
- Spastic
- Ataxic
- Hypokinetic
- Hyperkinetic
- Unilateral Upper Motor Neuron (UUMN)



Some Voice Characteristics in Dysarthria

- Dependent on type of type of dysarthria
 - Reduced or variable pitch
 - \circ Reduced or variable loudness
 - \circ Breathiness
 - Strained/strangled vocal quality
 - \circ Difficulty with stress and intonation







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Dysphagia

- Anatomy
- Dysphagia-related terminology
- Instrumental assessment
- Treatment planning



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Anatomy





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Dysphagia-related terms

Residue: Incomplete bolus clearance (e.g., "sticking in my throat" or oral "pocketing")

Penetration: food or liquids enter the airway, but do not go beyond the vocal folds.

Aspiration: When food or liquids enter the airway and go beyond the level of the vocal folds.

Silent Aspiration: Aspiration + no overt cough response, therefore, there is no clear sign that a person is aspirating.

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Assessment

- Patient-reported outcome measures
- Instrumental swallow assessment
 - Modified Barium Swallow Study (MBSS) also known as Video-Fluoroscopic Swallow Study (VFSS)
 - Fiberoptic Endoscopic Evaluation of Swallow (FEES)

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Instrumental Assessments

Fiberoptic Endoscopic Evaluation of Swallow (FEES)





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What is the purpose of a swallow assessment?

• Assess for...

- Swallow safety
 - Is there penetration or aspiration?
- Swallow efficiency
 - Is there oral or pharyngeal residuals?
- Effectiveness of strategies
 - Chin tuck does it actually improve either of the above swallow functions?



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Clinical Considerations



Source: Palmer, P., & Padilla, A. (2002). Risk of an Adverse Event in Individuals Who Aspirate: A Review of Current Literature on Host Defenses and Individual Differences. *American Journal of Speech-Language Pathology*, (31), pages 148-162.

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Generating a treatment plan

- Compensatory treatment
 - Diet recommendations
 - Safe swallow strategies
- Restorative treatment
 - Behavioral swallow exercises
 - o Instrumental swallow exercises



Compensatory treatment: Diet modifications

Goal: Safest, least restrictive diet

• Thin vs. Thickened liquids



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Compensatory treatment – Swallow strategies

- Strategies: Small bites Small sips Alternate liquids and solids (1 bite:1 drink) Pills whole with purce (e.g., applesauce) Pills crushed with purce (e.g., applesauce) Upright 90 degrees during and 30 minutes after meal Oral Lears After and Lears

 - Oral cares after meals
 Chin tuck
 Head turn to the right.
 - Head turn to the left.
 Effortful swallow

 - Avoid straws.
 - Use a straw to avoid tipping your head back when swallowing.

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Compensatory treatment – Swallow strategies Double swallow Swallow, throat clear, then re-swallow Head tilt to the right Head tilt to the left

- Chin tuck/head turn to the right.
 Chin tuck/head turn to the left.
- Slow rate of eating
 Supraglottic swallow (hold breath before and during swallow; swallow; then cough after
- swallow)
- Super-supraglottic swallow (hold breath while bearing down before and during swallow; swallow; then cough after swallow)
- □ Limit distractions during meals
- Avoid eating when fatigued.
 Avoid talking when food is in your mouth.

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Restorative treatment

Goal = Improve anatomical and/or physiological deficits identified on instrumental assessment with use of swallow exercises.



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Restorative treatment: Oropharyngeal swallow exercises

- Masako maneuver
- Effortful swallow
- Mendelsohn Maneuver



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Case Study - Initial evaluation

60 YOM with PMH significant for CVA (involving right lateral aspect of the medulla and moderate right cerebellar infarct), and hypoxic respiratory failure 2/2 aspiration pneumonia.

Swallowing:

- Chart review
- Diet:
 - Solids: Minced & moist (IDDSI level 5) • Liquids: Moderately thick (IDDSI level 3
- · Strategies: LEFT head turn with volitional throat clear Clinical swallow evaluation with ice chips revealed cueing required for strategies, multiple swallows for clearance, and cough responses.
- Voice:
- · Evaluating SLP noted hoarse vocal quality and clinically suspected possible vocal cord paralysis. ENT referral already initiated by PCP.

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Case study – Treatment

Swallowing:

- Initiated education/training on oropharyngeal swallow exercises: Effortful swallow, Masako maneuver, and chin tuck against resistance (CTAR).
- o Each session implemented swallow trials to some degree (Best exercises for swallow = swallowing)
 - · Oral cares completed at start of each session (+ education on importance)
 - Ice chips, thin water, solids (e.g., strawberries, soft granola bar)
 - Assessing for clinical s/sx aspiration and ability to independently implement strategies to promote swallow safety
- Voice: Initiated SOVT exercises to work on vocal function as PS was awaiting ENT evaluation.



Case study – Instrumental evaluation

ENT referral:

Clinically identify rough quality to voice with intermittent pitch breaks

Flexible nasal laryngoscopy

- Right true vocal fold immobility siting in a midline position
- $\circ~$ Bowing and glottic gap seen during phonation
- $\circ~$ Full mobility of the left true vocal fold
- $\circ~$ Compensatory supraglottic hyperfunction seen during phonation

Recommendations:

- $\circ~$ Continued therapy to work on voice and swallow at OWL clinic
- $\circ~$ Discussed potential to complete injection, but preferred to allow for
- spontaneous improvement with f/u in 6 months.

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Case study - Instrumental evaluation

Fiberoptic Endoscopic Evaluation of Swallow (FEES)

- Completed in outpatient OWL clinic to re-assess swallow safety and efficiency
- Trialed IDDSI 1 mild resulting with pen/asp with cough response clearing
 Trialed compensatory strategy (breath hold prior to the swallow), which resulted in penetration that cleared with cued double swallow
- COGNITION IS IMPORTANT!
- o Trialed IDDSI 6 (banana), which resulted in residuals

Recommendations:

- Free water protocol
- IDDSI 1 liquids with breath hold and double swallow strategies
- Continue IDDSI 5 solids

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Swallowing:

Within 2-3 sessions following FEES, PS was independently utilizing all compensatory strategies to promote swallow safety with intake. He was also completing restorative swallow exercises multiple times a day for HEP.

 Demonstrated great insight for diet modifications, including adding queso and sour cream to lose meat to meet IDDSI 5 standards.

Voice:

PS had decided to explore a second opinion for voice at an alternative ENT Center. PS was then recommended to complete VF augmentation and an esophagus dilation.

- Following completion, PS reported improved voice and swallow function.
- Self-upgraded to regular solids and thin liquids for all intake. Recommended repeat FEES; however, PS returned to work and did not return to clinic for repeat assessment.





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