Working with Parkinson’s: A Review for the SLP
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Disclosures and Conflicts of Interest
NONE

Learner Outcomes:

• To describe the impact of the voice, speech, and swallowing problems in persons with Parkinson’s disease.

• To explain assessment and treatment strategies and tools to provide best practices for persons with Parkinson’s disease.
Approximately only 3–4% of those with Parkinson’s disease receive speech treatment.

**TREATMENT APPROACHES**

**Lee Silverman Voice Treatment®**

Lorraine Ramig, Ph.D., CCC-SLP

**LSVT® Program**

- 1st speech treatment with short and long-term efficacy data documenting increased functional communication.

- Research has been supported by the National Institutes of Health (NIH) and the National Institute for Deafness and other Communication Disorders (NIDCD).
### LSVT® Program, cont.

- The program incorporates:
  - Enhancing the vocal source (adduction)
  - Using phonation as a trigger to increase effort and coordination through stimulating the “loud” global variable (respiratory support)
  - Retraining sensory processing during the speech production (increasing fundamental frequency range)

### LSVT® Program—cont.

- 1 hour therapy sessions/4 times a week/1 month
- 1 hour therapy sessions/2 times a week/2 months
- Receive 13–16 hours of individual therapy

### 5 CORE CONCEPTS

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Concept 1: Voice

• Improving vocal fold adduction
• Maximum impact on intelligibility
• Immediate reinforcement
• “THINK LOUD / THINK SHOUT”

Concept 2: HIGH EFFORT

• Overrides rigidity and hypokinesia by pushing patients to new effort levels
• Trains new target by putting the “load on the larynx”
• Dealing with a progressive neurological disease

Concept 3: INTENSIVE TREATMENT

• Daily opportunity to practice increases the chance of “building daily increments of vocal effort”
• Maintain motivation and accountability
• Maximize habituation and carry over
• Provides an opportunity for clinician to see patient’s daily fluctuations
Concept 4: CALIBRATION

• The patient knows and accepts the amount of effort needed to consistently increase loudness that is within normal limits

• Patient will use louder voice automatically

• Problem scaling amplitude of motor output related to voice

• Need to have “knowledge of results”

• Convince patient that loud/strong voice is WNL

• Habituation and carryover

Concept 5: QUANTIFICATION

• The key to motivate patient and provide feedback

• Objective methods to document improvement

• Previous speech treatment Ineffective/document efficacy

• Reimbursement/referrals/ethics

Speech Production Tasks

• Hierarchy activities:

  – Week 1: Words

  – Week 2: Phrases

  – Week 3: Reading aloud

  – Week 4: Conversation
Limitations

• Treatment dosage may not be possible for those with (1) physical limitations, (2) geographic barriers, (3) or financial reasons

• Trained and certified clinicians are not available across the country

• Lack of consistent insurance reimbursement may be an obstacle

Why is the LSVT® Program Successful?

• “Loudness” functions as a single motor organizing theme which enhances overall speech

• Intensive mode of administration is essential to maintain optimum treatment results

• By incorporating sensory awareness training, the patient feels more comfortable using their new louder voice

Speak Out!® Living with intent

Developed by Samantha Elandary, M.A., CCC-SLP
Founder and CEO of Parkinson Voice Project
Parkinson Voice Project

• Mission: To preserve the voices of individuals with Parkinson’s and related neurological disorders through intensive speech therapy, follow-up support, research, and community awareness.

• Vision: To collaborate with other compassionate speech-language pathologists to replicate our model program so that individuals with Parkinson’s and related disorders throughout the world will have access to our SPEAK OUT!® and LOUD Crowd® therapy programs.

What is speak out!®?

• Focuses on using INTENT to improve speech
• Typically consists of 12 sessions over 4 weeks, depending on patient’s needs
• Sessions consist of six therapy components:
  1. Warm Up
  2. Sustained “AH”
  3. Glides
  4. Counting
  5. Reading
  6. Cognitive-Linguistic

Candidacy for enrollment

• Able to tolerate a 40-minute session
• Able to follow simple commands
• When using INTENT two or more improves:
  – Breath support
  – Volume
  – Vocal Quality
  – Articulation
  – Intonation of speech
• Capability to complete daily home exercises independently or has appropriate support system to assist
General Benefits

- Engages the voice and starts the coordination of the respiratory and laryngeal systems
- Facilitates increased vocal intensity without straining
- Initial bilabial nasal consonant promotes forward nasal resonance

Specific Benefits

<table>
<thead>
<tr>
<th>Warm Ups</th>
<th>Reading</th>
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<tbody>
<tr>
<td>• Engages the voice and starts the coordination of the respiratory and laryngeal systems</td>
<td>• Coordinates respiration &amp; laryngeal systems with articulation</td>
</tr>
<tr>
<td>• Facilitates increased vocal intensity without straining</td>
<td>• Minimizes the thought process when using INTENT</td>
</tr>
<tr>
<td>• Initial bilabial nasal consonant promotes forward nasal resonance</td>
<td>• Begins the transfer of skills to conversational speech</td>
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<table>
<thead>
<tr>
<th>Glides</th>
<th>Counting</th>
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<tr>
<td>• Moves the cricothyroid to stretch the vocal folds</td>
<td>• Re-coordinates breathing pattern for speaking</td>
</tr>
<tr>
<td>• Increases the action of the adductor intrinsic muscles</td>
<td>• Increases breath support as syllables per breath increase</td>
</tr>
<tr>
<td>• May elevate tongue position and the larynx</td>
<td></td>
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<tr>
<td>• Targets muscles responsible for intonation of speech</td>
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<thead>
<tr>
<th>Sustained “AH”</th>
<th>Cognitive-Linguistic Exercises</th>
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<tr>
<td>• Increases awareness of breath support for speech</td>
<td>• Bridges the gap between reading and conversation</td>
</tr>
<tr>
<td>• Activates and coordinates the respiratory and laryngeal systems</td>
<td>• Provides structured tasks to elicit intentional speech while increasing cognitive load</td>
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Evidence that it works

- Research is new and continuous
- Conducted by June Levitt, Ph.D., LDT, CCG-SLP, Assistant Professor at Texas Women’s University
- Preliminary results show improved intensity on sustained “ah” when Speak Out!® was used as the primary treatment
MAINTAINING LOUD VOICE AFTER INDIVIDUAL TREATMENT

Structured activities to keep it going

Choral Singing

Fighting Parkinson’s one song at a time

A network of therapeutic choruses for people living with Parkinson’s

The Tremble Clefs mission is to engage the Parkinson’s community in voice therapy and mutual social support through singing, performance and the power of making music together.

Tremble Clefs™ of Tampa Bay began June, 2016 and is funded through NPF Grant: SET for Parkinson’s: Increasing Awareness of Communication Disorders

Group Treatment

- The LOUD Crowd®
- The Love Loud Group: Provides SUPPORT, EDUCATION and TRAINING for persons with Parkinson’s disease, their care partners and the community
- Vision: Aftercare program for maintaining functional daily communication for people with Parkinson’s
  - Enhance quality of life for people living with Parkinson’s disease
- Mission:
  - SUPPORT: Centralized resource to connect with local, regional, state, national and worldwide organizations to disseminate information (NPF, APDA, IMD)
  - EDUCATION: Facilitate interactive updates in Parkinson’s disease. Provide a forum for professional and community education.
  - TRAINING: Inclusive and supportive groups aimed at encouraging functional communication.
TECHNOLOGY FOR SPEECH ASSESSMENT AND TREATMENT IN PARKINSON’S DISEASE

Equipment Options...

- The basics (incl. Android and iOS apps)
  - Sound Level Meter
  - Digital Tuner
  - Stop watch
  - Digital recorder
- Software options
  - LSVT ® Companion
  - Tuners, timers and recorders
  - More advanced analysis tools

Sound level Meter

- Place 30 cm (12”) from pt mouth
- Set WEIGHTING to C position
- Set RESPONSE to FAST position
- Set to 70 dB, change as needed
- Tripod attaches to bottom
**Tripod for Sound Level Meter**

Screws into bottom of sound level meter

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**Mic stand (preferably with a boom)***

*This setup requires a camera mount adapter

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**Sound Level Meter with LSVT® LOUD**

- Mic to mouth distance usually 30 cm (12")
- Some use 50 cm (incl. LSVT® Companion Software microphone)
- Target values change depending on distance of sound level meter from mouth
Interpreting Sound Level Meter Values

- Decibel scale is logarithmic: small changes are large perceptual changes
- 3 dB change is a doubling of sound POWER
- 6 dB change is a doubling of sound PRESSURE
- 10 dB is a doubling of loudness
  - Person is TWICE as loud with a 10 dB change
- Same principles hold true for pitch range and changes

IOS and android sound level meters

- Options abound (search for “decibel meter” or “sound level meter” “decibel 10”)
- HOWEVER, calibration can be very tricky
  - Requires an add'l external SLM
  - True calibration would require a research quality environment and expensive equipment

Stopwatches

The old-fashioned kind... or use an app on your iPhone or android

Measure duration (in sec)
Computer and app-based options, cont.

LSVT® Companion software

• Automatically measures amplitude (in dB)
  Sustained phonation
  Glides
  Connected speech

• Benefits
  – Improved data collection
  – More precise
  – Automated
    Can focus clinical activities
    Gather more data, more frequently
  – Telemedicine?
    Home version

Wevosys LingWaves

Visi-Pitch IV Pentax Medical
Clicker counters

- Monitoring cues and prompts

Metronomes

Decibel 10

- Android app for visual reinforcement
SpeechVive®

- Uses an accelerometer to detect speech (via vocal fold movement)
- Plays “multispeaker babble” in earpiece to induce Lombard effect

SpeechVive®, cont.

- Based on research by Jessica Huber PhD CCC SLP at Purdue University
- NIH funded research to support efficacy
  - Immediate improvement in volume and intelligibility
  - In some instances, carryover to improvement without the device
- Unlike devices that use white noise/pink noise masking, no indication of desensitization to “multispeaker babble” cue (for at least three years)

Speechvive® Candidacy

YES

- Diagnosis of Parkinson Disease
- Experiencing voice changes that may include; decreased volume, increased rate, or poor articulation.
- Others may perceive your speech as too soft, too rushed, or mumbled.
- SpeechVive does not require the wearer to think about their speech so it works well with wearers who may experience cognitive decline.

NO

- People who do not want to wear a device in their ear will not make good SpeechVive candidates.
- People who rarely speak or are not willing to talk with others while wearing the device will not make good SpeechVive candidates.
- People who are unable to speak above a whisper are not good candidates for SpeechVive.
What if? Can SpeechVive® still be used?

- If PWP wears one hearing aid they may wear the device in the other ear. If they wear two hearing aids they may still use the device but will have to take one hearing aid out.
- SpeechVive has been proven to increase clarity and volume for patients who have had DBS and who have already completed a speech therapy program.

Personal amplification

- Although it’s preferable to improve vocal function, in some situations, amplification may be the most appropriate choice
  - Noisy public environments
  - Later stages of Parkinson’s disease
  - Persons with Parkinson’s plus diagnoses (particularly MSA)

Amplification options

- Voice Aerobics personal amplifier
  (www.VoiceAerobics.com)
- BoomVox™ Wireless Amplifier
  (www.griffinlab.com)
Allied Team Training for Parkinson (ATTP): A program of the National Parkinson Foundation

AAC on the iPad

- Speak it!  
- Tap To Talk  
- Speak up!  
  http://www.parkinsonspeechhelp.com/home
- TouchChat  
  http://www.silver-kite.com/touchChat
- Sono Flex  
  http://www.tobiisonoflex.com/
- LAMP Words For Life  

Swallowing

Dysphagia and Parkinson’s disease

- Frequent symptom
- 95% of people with Parkinson’s disease have a swallowing disorder
- Often associated with morbidity and mortality  
  – Leading cause of death with idiopathic PD
- As many as 15% have silent aspiration without complaints of dysphagia
- Has a negative impact socially and emotionally
The patient's view on dysphagia

- Some are unaware of their swallowing problem
  - Study of 20 patients only 7 out of 20 reported a problem
  - Assessment revealed 15 out of 20 having a swallowing problem
  - Another study showed 18 patients as having swallowing problems where only 13 felt there was a problem

Impaired Mechanisms in PWP w/Dysphagia

- Oropharyngeal bradykinesia and rigidity
- Incomplete cricopharyngeal relaxation
- Reduced cricopharyngeal opening
- Delayed initiation of the swallowing reflex

EVALUATION OF SWALLOWING
The Ideal Swallow

- Labial seal
- Tongue-base meets PPW
- Velopharyngeal closure
- UES elevation
- Full bolus clearance
- Hyolaryngeal excursion
  - Elevation of ½ - 1 vertebral segment
  - Anterior movement in hyoid (posterior 3rd to ½ mandible length)

How….Evaluating the Swallow

- Patient’s perspective
  - Quality of Life Survey/Questionnaire
- Clinical Swallow Evaluation
  - Look and listen
- Visualization
  - MBS
  - FEES

PATIENT REPORT
QoL Surveys and Questionnaires

- Eating Assessment Tool (EAT-10)
- Dysphagia Handicap Index
- Swallowing-QOL Survey (SWAL-QOL)

*See handouts provided

CLINICAL SWALLOW EVALUATION

Clinical Swallow Evaluation

- Common S/S of Dysphagia
  - Forward head posture with poor oral stability and respiratory compensation
  - Pt has food or liquid falling outside of mouth
  - Pt has food/liquid residue in oral cavity after swallowing
  - Pt has food/liquid that gets stuck inside of cheek
Common S/S of Dysphagia, cont.

– Pt has wet/gurgle voice quality after swallowing
– Pt coughs after eating/drinking
– Pt clears throat after drinking liquids/eating foods
– Pt chokes while eating food or drinking liquids

Common S/S of Dysphagia, cont.

– Pt makes an effortful face while swallowing food or liquid
– Pt has a lot of phlegm and congestion after eating food or drinking
– Pt c/o pain in throat area or food/liquid getting stuck in throat
– Pt coughs before swallowing when food/liquid is inside the mouth

Common S/S of Dysphagia, cont.

– Recent, unexplained weight loss
– Avoid drinking liquids
– Globus sensation in throat
– Tendency to drool
– Food collecting around gumline
– Coughing or choking before, during or after eating or drinking
– Frequent heartburn or sore throat
Common S/S of Dysphagia, cont.

- Difficulty moving food back
- Difficulty keeping food/liquid in mouth
- Eating time increased
- Trouble swallowing pills
- Loss of appetite
- Voice change after eating or drinking

MORE ON COUGHING

Cough Sensitivity and Parkinson’s

- Dysphagia and dystussia coexist in PD
- Reflex to cough is preceded by the respiratory sensation known as urge to cough (UTC)
- 2014 study of 20 participants (14 men, avg., 68 yo) with mild-moderate PD and no hx of AP:
  - Tested in window of optimized medication function
  - 3-oz thin-liquid challenge of barium with SLP under fluoroscopy (P-A score obtained)
  - Given 2 trials of capsaicin (2-coughs within 30 s, reliable)
  - Pt rated UTC on scale from 0-10
Cough Sensitivity and Parkinson’s, cont.

- Results:
  - Participants without dysphagia had a reliable Cr2
  - Only 50% with dysphagia had a reliable Cr2
  - Obtaining true thresholds could not be established for all participants
  - As the P-A score increased the CrTot decreased and vice-versa

VISUALIZING THE SWALLOW

MBS vs FEES
MBS & FEES Common Findings

- Poor bolus manipulation
- Premature spillage
- Pooling into valleculae and/or pyriform sinus
- Oral and pharyngeal residue
- Inability to clear bolus
- Decreased sensory reaction
- Increased duration pharyngeal transit

MBS & FEES Common Findings, cont.

- VPI
- Food residue in the oral sulci
- Slow oral transit
- Tongue pumping
- Reduced diameter of UES
- Prolonged opening of the UES

Beyond our scope

THE ESOPHAGEAL STAGE….WHAT DO WE KNOW, WHAT SHOULD WE KNOW, AND WHAT DO WE DO?
**Esophageal Issues in PD**

- Entire GI tract is affected
- GI issues (constipation, early satiety) often precede motor symptoms
- Constipation and meds
  - Side effect

**Within our scope: Identifying Esophageal Symptoms**

- Reflux Severity Index (RTI)
- Patient interview
- Recognize Symptoms

**Esophageal Phase of Swallow**

- Characteristics and symptoms (As PD progresses dopamine depletes & symptoms increase)
  - Reduced motility from esophagus downward
  - Feeling “full” too soon (satiety)
  - Heartburn/reflux
  - Disintegration of the myenteric plexus (GI Tract)
  - Poor stomach emptying
  - Food getting stuck
  - Coughing
  - Slow rate of eating
  - Chronic constipation
SWALLOWING THERAPY

BEFORE THE BITE

Importance of Oral Hygiene

- Oral care:
  - Keeps bacteria in saliva from being aspirated
  - Keeps the mouth moist and clean
  - Keeps food particles from being aspirated after meals

Thickened liquids increases the risk of dehydration and dry mouth making oral care especially important.
Neutral Head Position

• Head position is important because it maximizes:
  – Bolus control
  – Anterior to posterior transport of bolus
  – Cricopharyngeal opening
  – Bolus propulsion into the esophagus

A lengthened airway decreases the effectiveness of muscles used to close off the airway = increased risk of aspiration.

Suggestions for improving neutral head positioning

• Tilt wheelchair
• Meals at the table
• Place pillow behind head
• Straws versus no straws
  – Open for discussion
• Chin tuck versus head in neutral position
  – Open for discussion
• Soft cervical collar or neck brace

Diet Modification
## Diet Modification: Textures

<table>
<thead>
<tr>
<th>LIQUIDS</th>
<th>SOLIDS</th>
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<tr>
<td>THIN: Will not coat the spoon, moves quickly, anything that turns into liquid in the mouth within a few seconds</td>
<td>REGULAR: No food restrictions</td>
</tr>
<tr>
<td>NECTAR: Will coat the spoon or sides of glass/cup, will pour freely in small rapid drops</td>
<td>MECHANICALLY ALTERED: Moist, soft-textured, easy to form into a bolus, some chewing</td>
</tr>
<tr>
<td>HONEY: Pours slowly like honey, straw will stand up, if spilled, will spread rather than splash</td>
<td>GROUND: Tiny pieces, moist</td>
</tr>
<tr>
<td>PUDDING: Falls from spoon in a glob, will still move in a cup turned upside down</td>
<td>CHOPPED: All food is chopped or cut into small pieces</td>
</tr>
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<td></td>
<td>PUREE: Smooth in texture, no chewing needed, easy to form and swallow bolus</td>
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### IT’S ALL ABOUT THE THICKENER

**Are thickening liquids always the best?**

- Works well for oropharyngeal dysphagia

- Sometimes contradicted for esophageal dysphagia
  - Moves slower
  - Thin liquids better but increases risk
Tips for Thickening

- Use the correct amount of thickener.
- Pour and stir at the same time.
- Let stand for recommended time.
- Liquid medications need to be thickened.
- Dissipate carbonation by adding only a small amount of thickener to sodas.
- Place thickener in cup before adding liquid to avoid lumps.
- Stir beverage once more prior to serving.

How to make it taste better

- Use chilled beverages.
  – May use ice cubes-remove before thickening
- Add lemon or lime juice to flavor water.
- Avoid over thickening.
- Add ginger ale to juices.
- For a tasty treat make Kool-Aid, add thickener and then freeze into popsicles.

Thickened Liquids and Dehydration

- Allows for normal hydration
- Digestible
- Doesn’t bind fluid
- 98% of free water is released after consumption
- Offer beverages throughout the day
- Offer foods with high water content
  – Make sure foods are prepared to the safest level for the patient
DIETS

Diet Modifications: Slick Diet
- Good for dysmotility issues (also hiatal hernia and esophageal scarring.)
  - Swallow 1 tsp oil (olive) before eating
  - Eat foods with gravy or better
  - Try this recipe:
    Prepare box of Jell-o according to package (may add thickener)
    Refrigerate until it begins to gel
    Remove from fridge—add one-fourth cup of cold liquid for every cup of Jell-o the recipe makes
    Mix and refrigerate
    Pt eats bit of food, swallow, then bite of Jell-o

Diet Modifications: Reflux
- Dietary and behavioral recommendations:
  - Warm fluids with meals
  - Smaller more frequent meals
  - Avoid fibrous solids
  - Avoid tight fitting clothing around waist
  - Avoid spicy foods
  - Stay upright at least 1-2 hours after eating
  - Any more?
FEEDING AND END OF LIFE CONSIDERATIONS

Hydration

• Debate Over Hydration
  – Fear of making patients uncomfortable
  – Studies suggest that fluids play a minimal role in patient comfort as long as meticulous mouth care is given
  – Providing “comfort foods” and oral hydration found to be therapeutic for the patients.

Hydration, cont.

– The oral intake of fluids decreases during the dying process.
– Water deprivation increases the body’s production of endogenous opiates that create a euphoric state and has been associated with a reduction in pain.
– Can increase pulmonary secretions, urinary output, nausea, vomiting, and edema.
– Dry mouth should be managed with ice chips, lip balm, and moistened swabs.
**Tube feeding**

- Challenges with esophageal dysmotility:
  - Promotes GERD or LPR
  - J-tubes should prevent reflux
  - Requires nighttime feeding
  - Easily migrates

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**Important take home message**

- Not one size fits all
- Considering only the oropharyngeal stages of swallowing can be detrimental
- Use your knowledge of all three stages to make your recommendations
- Ask yourself what if?

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**SIALORRHEA**

The Dreadful Drool
**FUN FACT**

- The average human can produce 1.5 liters of saliva per day
- That’s 6.34 cups!
- Or 3 of these soda bottles

![Image of soda bottles]

**What is it?**

- Drol!  
- Drol does not = increased saliva  
- Drol does = restricted swallowing and dysfunction  
- Excessive saliva accumulation in the oropharynx  
- Inability for PWP to control  
- Affects 75 to 80%  
  - Lower in mild stages  
- Both nocturnal and diurnal

**How does it impact the patient?**

- Physical and psychosocial complications:  
  - Perioral chapping  
  - Dehydration  
  - Odor  
  - Social embarrassment  
  - Isolation
**What to do:**

- **Strategies**
  - Frequent sips of water
  - Sucking on ice chips
  - Keep head up
  - Close lips
  - Reduce sugar intake
  - Swallow frequently

**What to do, cont.:**

- **Anticholinergic medications**
  - Side effects may include dry mouth, constipation, blurred vision, drowsiness, hallucinations, difficulty with micturition and urinary retention, and MCI.
  - Dose should be as small as possible for improvement

- **Sublingual Atropine**
  - Only approved drug

**What to do, cont.:**

- **Botox Injections**
  - A & B
  - Administered to parotid glands
  - Best administered with ultrasound guidance
  - Synaptic function will rejuvenate in 2-3 months requiring recurring injections
MULTIPLE MEDICATIONS

The Dilemmas they Present

• Dry mouth
  – Food adheres to base of tongue, throat and maybe esophagus

• Muscle impairments
  – Uncoordinated swallows

• Reflux
  – Damages peristaltic movement of esophagus

• Lethargy
  – Increases risk for aspiration, dehydration and poor nutrition

DYSPHAGIA TREATMENT
Strength Training?

- Questions to ask
  - What does the client have to be strong enough to do?
  - What evidence proves that the weakness is the only or main factor that prevents the client from doing that?
  - If truly a weakness, will the exercise make them stronger?
  - Will becoming stronger improve the target function?

LSVT

- After 1 month of 4-5 sessions conducted in 1-week @ 50-60 minutes:
  - Improved neuromuscular control of the entire upper aerodigestive tract
  - Improved oral tongue and tongue base function during the oropharyngeal phase of swallow

Myofascial Release

The verdict is still out for PD

- What is it?
  - EBP
    - Improves muscular tension for functional pressure generation
  - Manual Therapy Technique

- How does it work?
  - Corrects restrictions in muscle and connective tissues
Techniques and Exercises

- Research is limited
- Effortful swallow
- Chin Tuck
- Tongue strengthening
  - Short term

Respiratory Training

- Exercise based program
- Strengthens the muscles used in breathing.
  - Leith and Bradley (1976) first demonstrated in healthy individuals that the respiratory muscles, like their skeletal muscle counterparts, could be specifically trained to improve strength or endurance.
- Increases activity of the submental muscles
- Elevates the hyoid bone
- Improves cough and swallowing
- Improves speech although not significantly

Respiratory Training, cont.

- Can be either inspiratory (active) or expiratory (passive)
- Typically accomplished using handheld devices
- Training durations are usually 4-8 weeks between 20-30 min per day
Respiratory Training, cont.

Leading researcher Dr. Christine Sapienza, University of Florida
Jacksonville University
Dean of the Brooks Rehabilitation College of Healthcare Sciences
Program Director and Professor, Communication Sciences and Disorders

What is the EMST 150 device?

- Developed to assist with strengthening the expiratory muscles used for breathing.
- EMST stands for Expiratory Muscle Strength Training.
- Pressure range that goes to 150 cmH20
- The EMST 150 is a simple, short way to strengthen the muscles used during expiration.

Does it work?

- Research conducted since the late 1990’s.
- Latest work has focused on patients with Parkinson’s disease.
- The largest randomized clinical trial on EMST is now published in Neurology (2010) showing positive outcomes for variables related to airway protection.
WRAPPING IT UP

In closing SLP’s should consider:

- Completing a thorough CN examination of nerves involved in swallowing.
- Alertness and positioning of the PwP
- Previous levels of oral intake and reported difficulties
- Any previous recommendations
- Current respiratory status
- Carrying out a full clinical swallow study
- Refer for instrumental analysis
- Know advance directives when considering alternate means of feeding

Additional considerations:

- Potential Interventions to Support Swallowing:
  - Oro motor exercises
  - Appropriate saliva management
  - Modified diet consistencies
  - Swallow therapy exercises
  - Care partner training
  - Environmental adaptation
  - Joint working
  - Alternative methods of feeding
  - Medication
Bibliography

Please refer to separate handout

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