# SWALLOWING ISSUES IN PD

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Ms. Hodges received her master's degree in Speech, Language, and Hearing Sciences from the University of Colorado. She has been part of LSVT LOUD's research team since 2004. Ms. Hodges is a consultant, expert clinician, training and certification faculty and CE Administrator with LSVT Global. She also enjoys her role within LSVT Global collaborating and presenting on Google's Project Euphonia, which aims to improve voice recognition software for those with dysarthria and dysphonia. In addition to specializing in neurogenic voice and speech disorders, Ms. Hodges worked for 13 years at an outpatient hospital **specializing in diagnosing and treating swallowing disorders**, dysphonia, and upper airway disorders. She has presented nationally and internationally on LSVT LOUD, Parkinson's disease, PVFM/VCD, cough, and dysphagia. Ms. Hodges has published articles and a book chapter on speech treatments for upper airway disorders.

# Feeding and Swallowing

- Vital for proper nutrition and protecting the airway during wakefulness and sleep
- Also, incredibly important aspect of social interaction.
- Much of our communication with friends and family occurs over meal time.
- So, feeding and swallowing serves both basic body functions and important social needs.

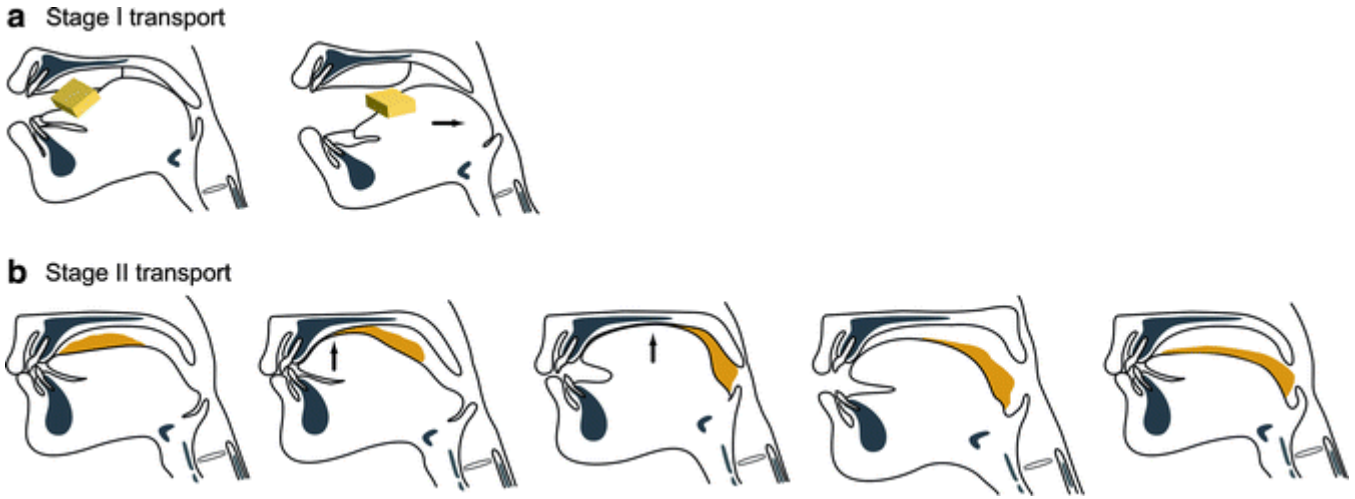
# Feeding and Swallowing

- Swallowing is a complex sequence of movements
- Feeding and swallowing are often broken down into a series of stages or phases.

# What is Swallowing?

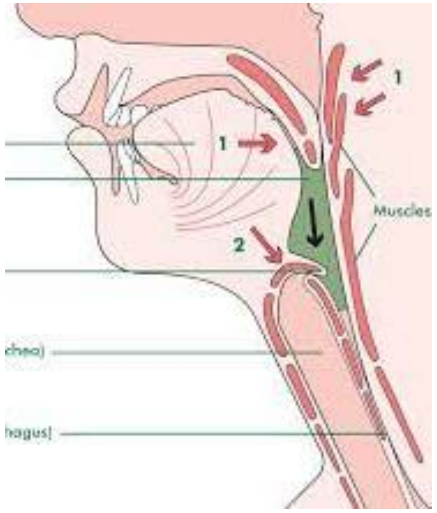
**First stage** (Oral Phase):

- Biting, sipping, chewing and
- Forming the food/drink into a formed ‘glob’
- Pushing the glob to back of the mouth with your tongue



# What is Swallowing?

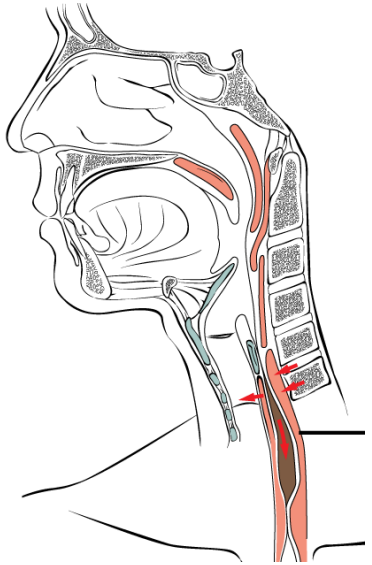
- **Second stage (**Pharyngeal Stage)
  - Food/drink passes through the throat
  - Airway and nasal cavity are closed and protected
  - Our breath is held as we swallow



# What is Swallowing?

- **Third stage (**Esophageal phase)
  - Top of your esophagus opens and allow food/drink in
  - Squeezes and gravity moves it down the esophagus to the stomach

  - **Difficulty with any phase of swallowing is called DYSPAGHIA.**



# Safe Swallow vs Dysphagia

- **Safe swallowing is when the food/drink**:
  - Stays in the mouth
  - Goes through the throat without leaving any food/drink behind
  - Does not enter the airway
  - Moves through the esophagus without delay

# Safe Swallow vs Dysphagia

- **Dysphagia includes**:
  - Incomplete chewing
  - Food or liquid falling out or getting stuck in the mouth
  - Food/liquid gets stuck in the throat or enters the airway
  - Food/liquid gets stuck along the way to the stomach
- MORE DETAILS ON SPECIFICS AND PD TO FOLLOW

# Swallowing Fun Facts

- The act of swallowing is also called deglutition and chewing is mastication!
- It takes 2-9 seconds for something swallowed to go from the back of the mouth to the stomach. Involves more than 30 different nerves and muscles at work!
- The Adam's Apple moves up and out when we swallow. This is the larynx moving.
    - Yes, men and women have Adam's apples. Women's are smaller, but can be felt if you feel your throat when you swallow.

# Swallowing Fun Facts

- Saying “Something went down the wrong way” is accurate!
  - It is when food/drink or saliva goes the route of the airway instead of the esophagus.

# Swallowing Fun Facts

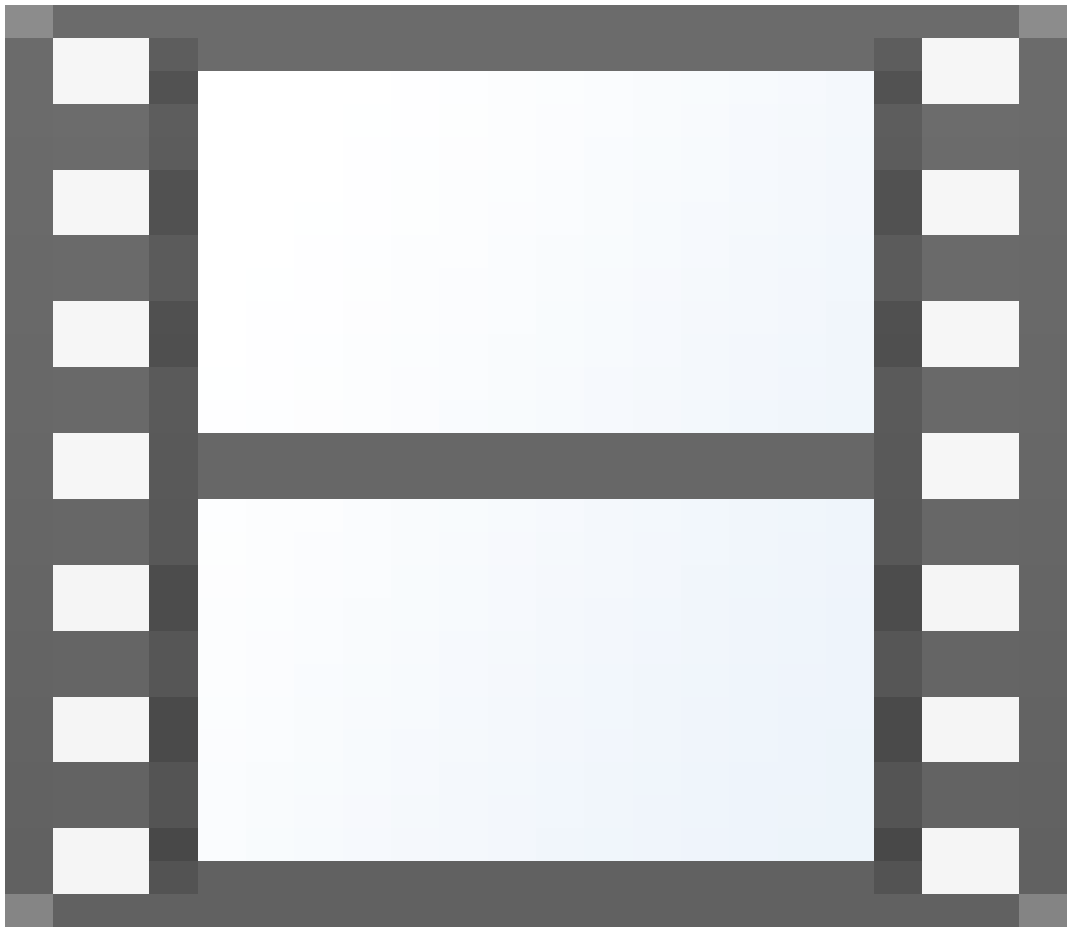
- Gravity helps us swallow but isn’t necessary. The strong squeezes of throat and esophagus means we can swallow upside-down!

# How do we look to see if everything is going well during swallowing?

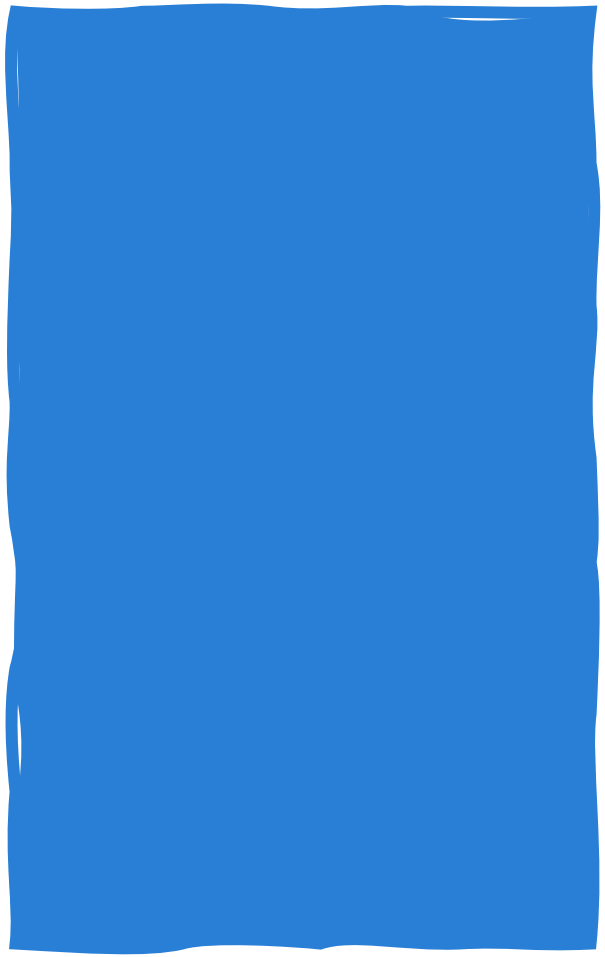
- Speech language pathologist and other professionals use clinical tests and instruments to look to see what is going on with swallowing
- Sometimes instruments are used because we can't "see" inside the mouth, throat and esophagus during swallowing.
- One example of this instrument is a videofluoroscopic exam.  It takes place in radiology and is often run by a speech-language pathologist
- You eat and drink in real time while your swallow is examined

# Swallow of a Banana Normal

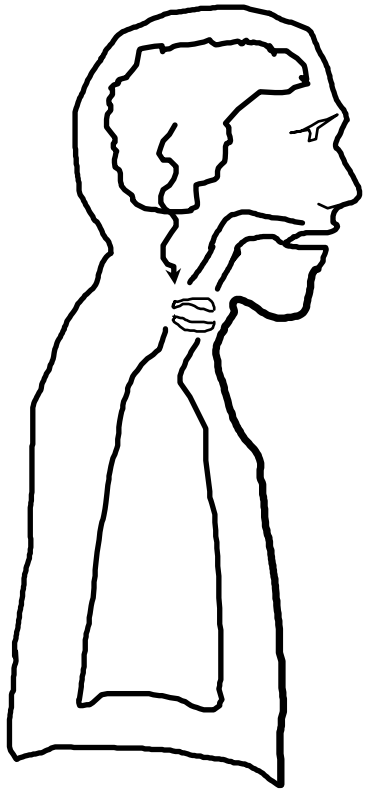
- video



# Parkinson’s and Swallowing



# Motor Impact on Swallowing in PD



Loss of Motor Energy, Movements underscaled

- Rigidity
- Hypokinesia
- Bradykinesia
- Tremor

# Motor Impact on Swallowing in PD

**Bradykinesia (slower movement)**

**Timing in Swallowing Matters:**

- Airway to close/protect
- Keeping food/liquid in your mouth
- Coordination
- Esophageal opening

# Motor Impact on Swallowing in PD

**Hypokinesia** (smaller movements)

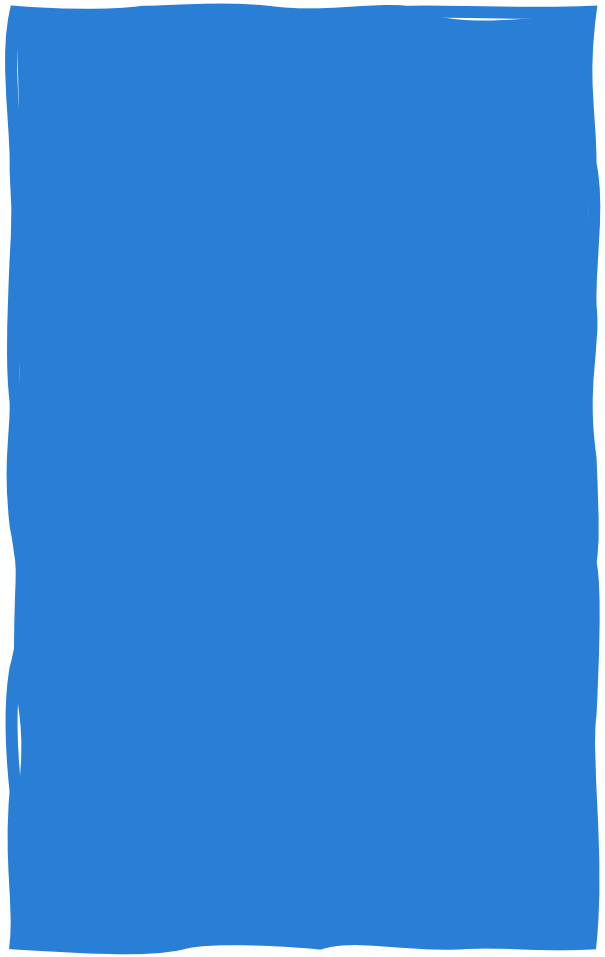
Range of Motion Matters For:

- Chewing and bolus formation
  - Keeping food/liquid in the mouth
  - Your larynx to move up to close the airway
  - The swallowing to squeeze food and drinks into the esophagus

# Good News!

**Exercise is Medicine**

**Early Intervention Matters!**



# Non motor Impact on Swallowing in PD

- Sensory deficits
- Reflux (LPR and GER/GERD)
- Gastroparesis
- Malnutrition
- Dehydration
- Apathy towards eating/mealtime

# Sensory Impact on Swallowing in PD

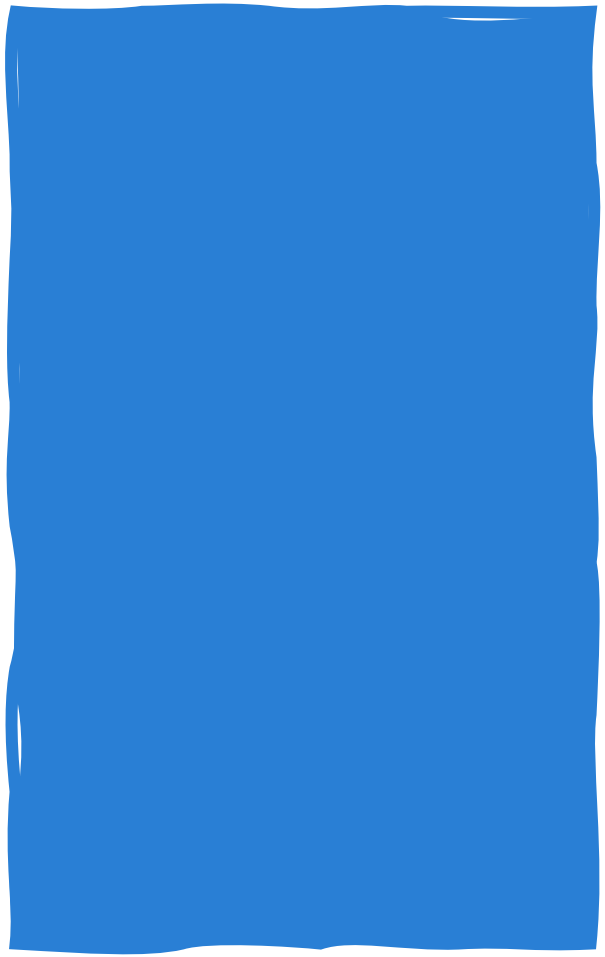
Small/slow movements may be **perpetuated** by abnormal sensory feedback.

Results in:

- Reduced awareness of swallowing difficulties
- Lack of self-correction
- Respond positively to external cue, difficulty with internal cue of self-correction
- Do not spontaneously maintain or adapt treatment techniques *without intensive treatment with a sensory focus*

# Good News!

**Treatment Interventions CAN Address AND Improve Sensory Deficits**



# Why might PD influence both swallowing and voice?

- Feeding/swallowing and speech/voice share the same anatomical structures
- Both require coordinated activity across respiratory, laryngeal and oral-articulatory systems (McFarland, 2014; McFarland & Tremblay, 2006).

# Common Underlying Pathology

"Rigidity and bradykinesia appear to underlie the volitional speech abnormality as well as the disordered volitional oral stage of swallowing." Robbins et al., 1986, p.286

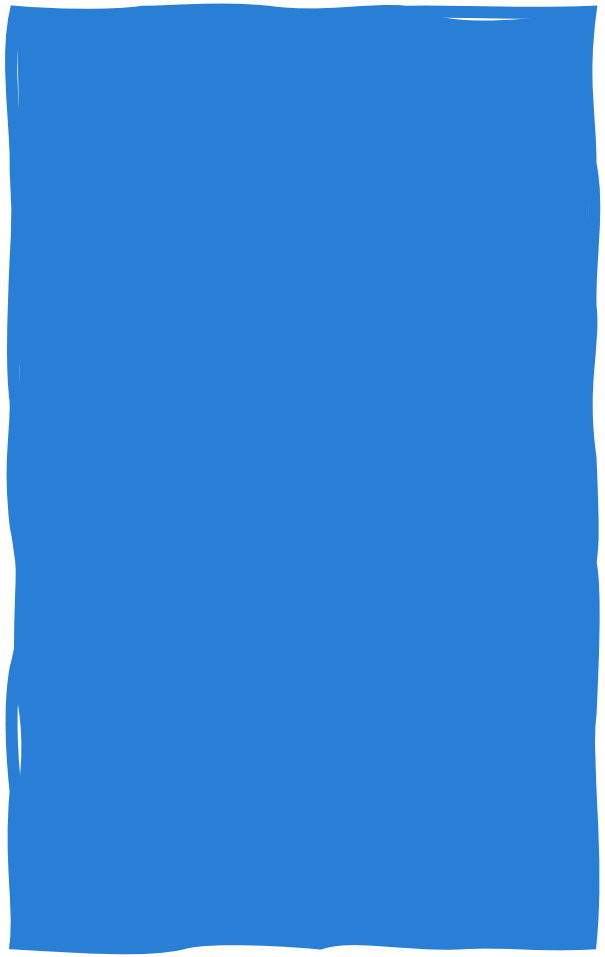
- Problems in movement scaling and sensorimotor integration characterize both speech and swallowing impairments associated with PD.

# Shared Neural Control of Speech and Swallowing

- There is at least some degree of shared neural control of these seemingly diverse behaviors (McFarland & Tremblay, 2006).
    - Sensorimotor integration is crucial for both

- PD results in degeneration of these neural systems/networks.

# LSVT LOUD and Swallowing in PD



# LSVT LOUD Key Concepts

Incorporates principles of neuroplasticity
Administered in an intensive manner to
challenge the impaired system

**Hypokinesia, Rigidity, Bradykinesia**

**TARGET:** Amplitude - Vocal loudness

**Exercise is Medicine!**

**MODE**: Intensive and High Effort

One-hour, individual treatment sessions; four days a week for four consecutive weeks. Daily homework and carryover exercises.

**Sensory Intervention!**

**CALIBRATION**: Generalization

Addresses barriers to generalization outside of treatment room

Ramig, et al., 1994; Ramig, 1992; Dromey et al., 1995; Sapir et al., 2007; Fox et al., 2002; Fox et al., 2006; Ramig et al., 2018

## Intensity across sessions:

Treatment delivered 4 consecutive days a week for 4 weeks. One-hour, individual treatment sessions

Daily homework practice (all 30 days of the month)

Daily carryover exercises (all 30 days of the month)

Life-long habit of continuous practice

## Intensity within sessions:

High effort

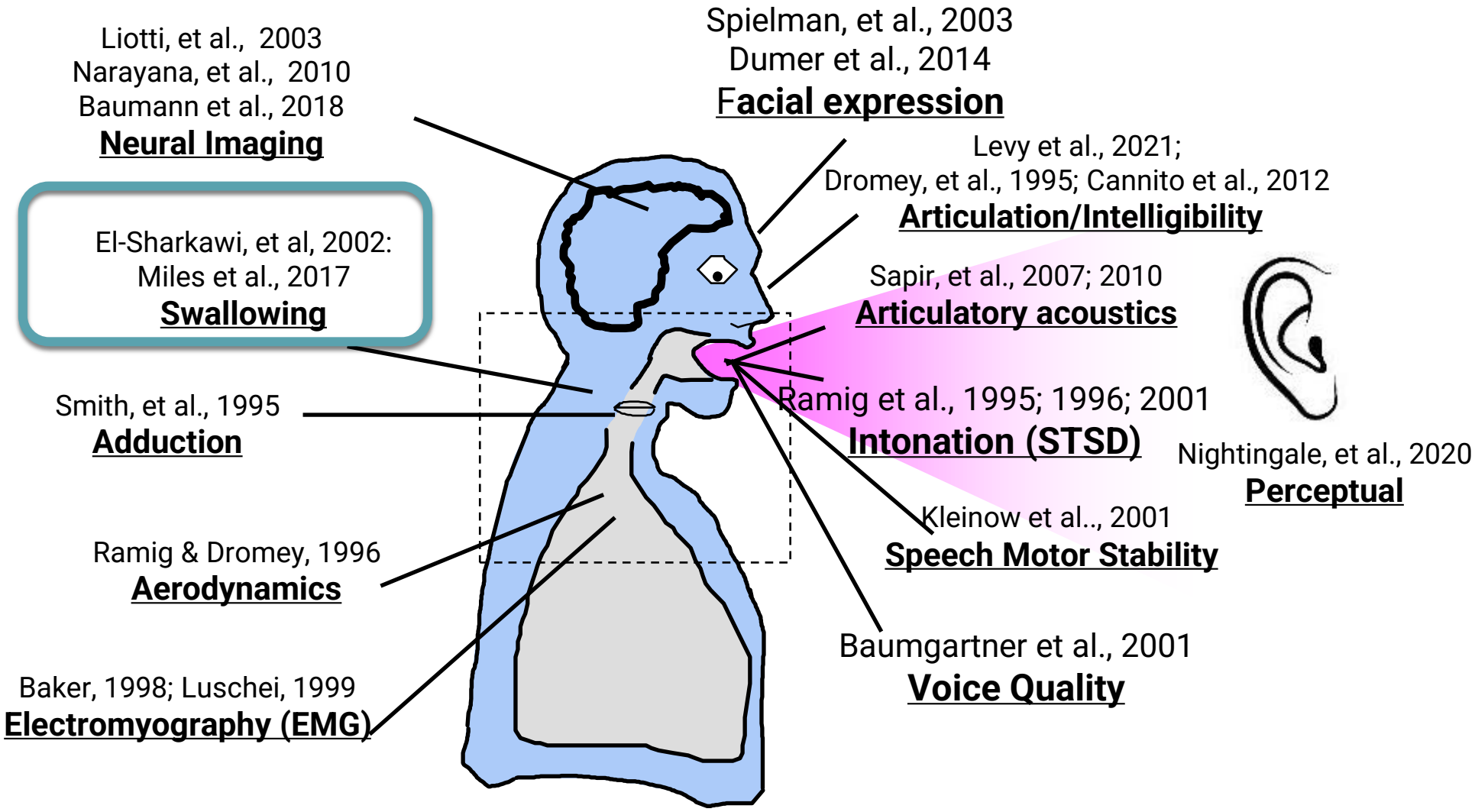
Amplitude, Repetitions, Force/resistance, Accuracy, Fatigue

# What do we know about the impact of LSVT LOUD on Swallowing?

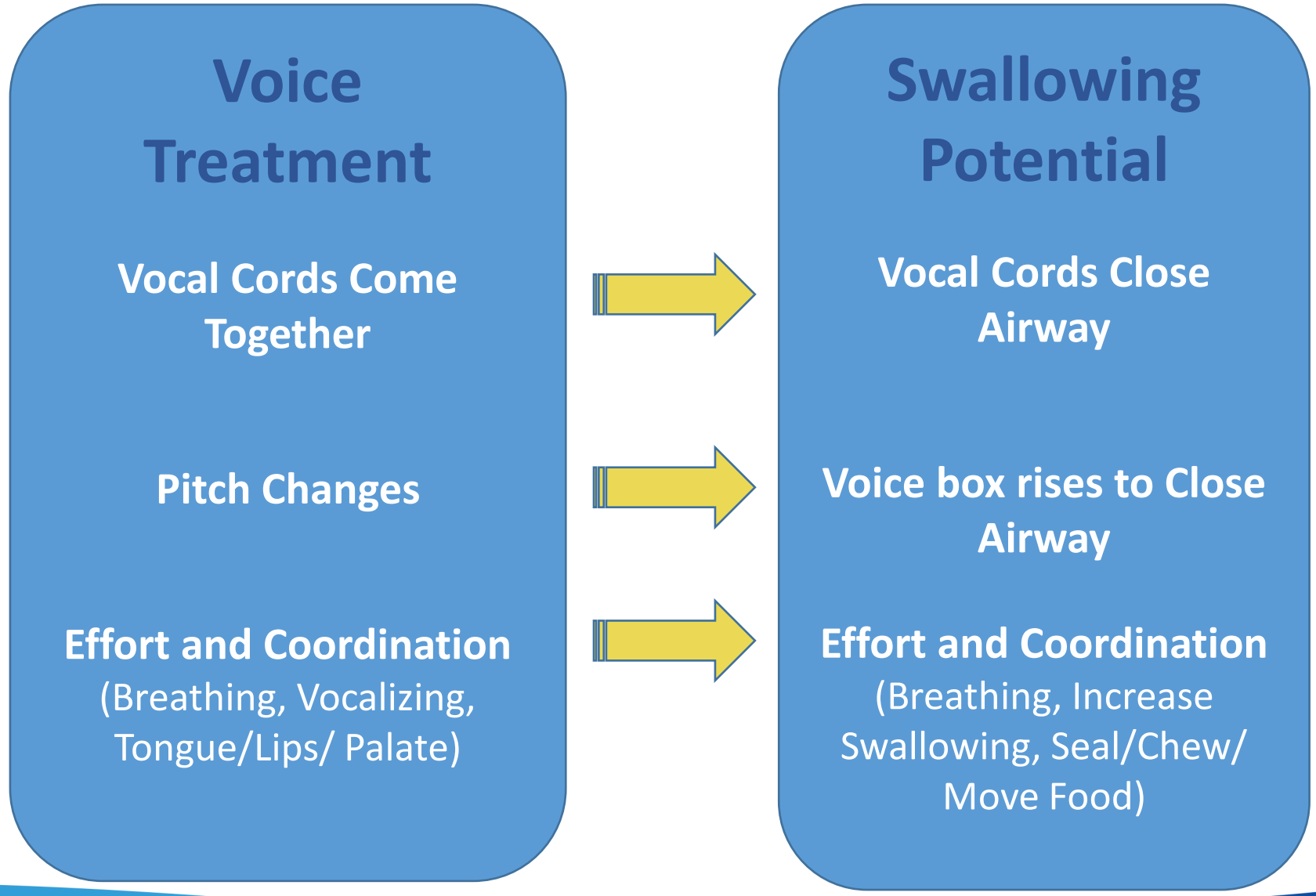
# Evidence for LSVT LOUD

## 3 Randomized Controlled Trials-Gold Standard for Treatment Efficacy

Beyond Efficacy – numerous studies (over 30) examining
distributed effects, neural correlates, mechanism of change



# Cross-system influences



# Main Findings

- Post LSVT LOUD
  - Improvements were seen in lingual function including increased anterior/posterior tongue movement, tongue strength (inferred), and anterior/lateral lingual stabilization of the bolus
  - Overall improvements in swallowing efficiency

**El-Sharkawai et al. 2002**

# Main Findings

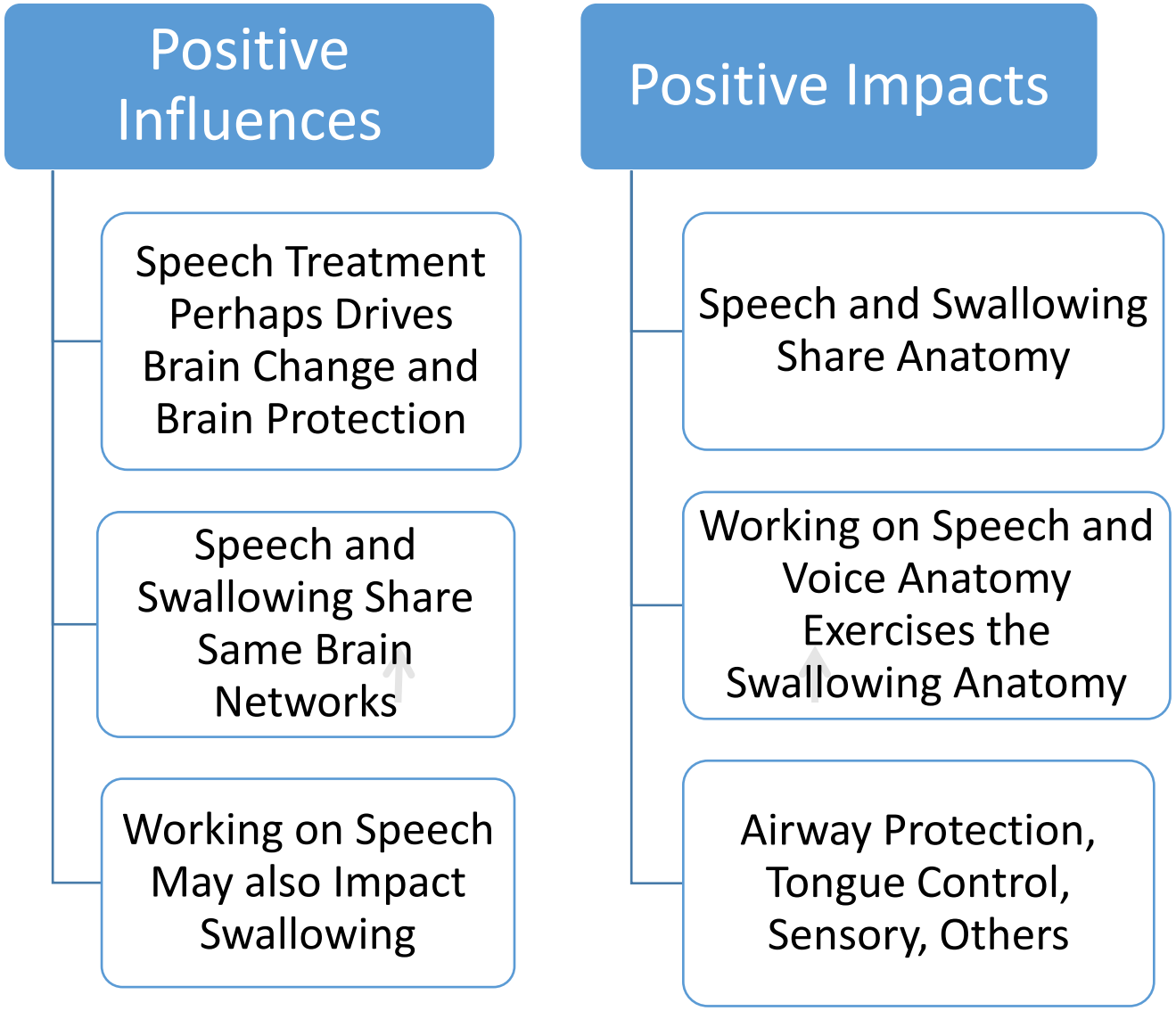
- Post LSVT LOUD
  - Of the 8 patients that scored outside of the normal range for the EAT-10, 6 improved, one remained the same, and one worsened.
  - The quantitative measures of VFSS revealed significant increases in PES opening during 20 ml fluid swallows and there was a significant reduction in residue with paste bolus.
  - Improvements were noted in cough peak expiratory flow rate.

**Miles et al., 2017**

# Important

“However, LSVT LOUD is not a replacement for direct swallowing treatment for this population at this time.” page 186

# Summary of Cross-system influences



# LSVT LOUD Does Not Replace Swallowing Therapy

- Research is ongoing
- Objective assessment and tailored recommendations remain the gold standard
- Initial findings are interesting in terms of:
  - Spread of Effects of LSVT LOUD Across the Motor Speech Mechanism
  - Possible “Added Bonus” to continuing to Exercise the Voice (HEP)
  - Continued Research to Further Understand the Speech and Swallowing Mechanisms and Their Relationship

# Signs and Symptoms of Swallowing Changes

# AND

# What Do I Do About It?

# Next Steps

Patients with signs/symptoms or unexplained chest congestion or pulmonary infections:

- Obtain physician order for a swallowing evaluation
- Modified Barium Swallow Study
  - Gold Standard for finding:
    - Specific Challenges and Impairments
    - Appropriate, Actionable, Feasible Compensatory Strategies
    - Safest Diet
    - Provides personalized recommendations
      - **NOT ALL SWALLOWS ARE THE SAME**
      - **RECOMMENDATIONS ARE TAILORED**

# Prioritize Treatment Focus

- **LSVT LOUD First**
  - Dysphagia s/s are mild or non-existent
  - Lack history of bronchopulmonary infections
  - Physician approval
- **Dysphagia Diagnosis/Treatment First**
  - Dysphagia s/s are moderate +
  - History of bronchopulmonary infections (ongoing)
  - Dietary limitations (thickened liquids, puree, etc.)
- **Concurrent Treatment**
  - Must adhere to LSVT LOUD protocol (60 min sessions, 4x4/wks)
  - Back to back or with a break in between
  - Depends on your facility type/insurance

Because you can IMPROVE → Exercise is Medicine → Keeping You SAFE → Maintain the JOY of Eating

- **Swallowing therapy with a speech-language pathologist**
  - Exercises to strengthen swallowing
  - Exercises to improve coordination swallow
  - Exercises to improve coordinated breathing for swallow sequence, breathing muscle strength, more efficient cough
  - Dietary Considerations
    - Calorie Intake to Maximize Energy
    - Viscosity Matters
    - Sensory Matters
    - Candidacy for free water

# Swallowing Intervention
# Speech-Language Pathologist

PERSONALIZED

EMPOWERED

MOTIVATING

# Feeding Intervention
# Occupational Therapist

FINE MOTOR

ASSISTIVE

LSVT BIG

# Tips for Safe Swallowing

- Limit Distractions
- Thoroughly Chew
- Swallow a Bite Before Taking the Next
- Take One Drink at a Time
- Sit Straight and Keep your Head Neutral
- Very Cold or Flavorful Food/Drink Increases Sensory Input
- Swallow Twice for Each Bite or Sip
- Take Caution with Straws (help or hinderance)
- Stay Well-Hydrated
- Monitor Coughing or Throat Clearing When Swallowing

# Summary

- Etiology of Dysphagia in PD is Multifaceted
- Bradykinesia and Hypokinesia as Drivers in Disordered Swallowing
- Common Underlying Physiology Impacts from PD on Voice and Swallowing
- Preliminary Research Suggests Potential of Cross-System Interactions and Distributed Effects of Treatment
- Individualized Diagnostics and Treatment for Swallowing Disorders Remain **LSVT LOUD Does not Replace Dysphagia Tx**
- Prioritize Treatment as Indicated and Able
  - LSVT LOUD, Dysphagia—Concurrent or Serial
- Occupational Therapy, including LSVT BIG, may address feeding.

# Thank you!

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