

The Gut-Brain Connection

And the Role of Speech-Language Pathologists
in Nutrition for Dysphagia

Part 2

By: Dysphagia Duo

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October 16, 2024

Objectives of the presentation

- **Understand the Gut-Brain Connection** - Explore how the central nervous system communicates with the gastrointestinal (GI) system and how this relationship affects swallowing and digestion
- **Define Dysphagia and its Nutritional Impacts** - Learn the different types of dysphagia, how it impairs swallowing, and the consequences for nutritional status, including malnutrition and dehydration
- **Role of Speech-Language Pathologists (SLPs) in Dysphagia Management** - Delve into the assessment, diagnosis, and treatment techniques used by SLPs to improve swallowing and ensure nutritional safety
- **Examine SLPs impact on Nutrition in Dysphagia Rehab** - Focus on how SLP interventions, in collaboration with dietitians, contribute to maintaining or improving a person's nutritional intake, quality of life, and overall health

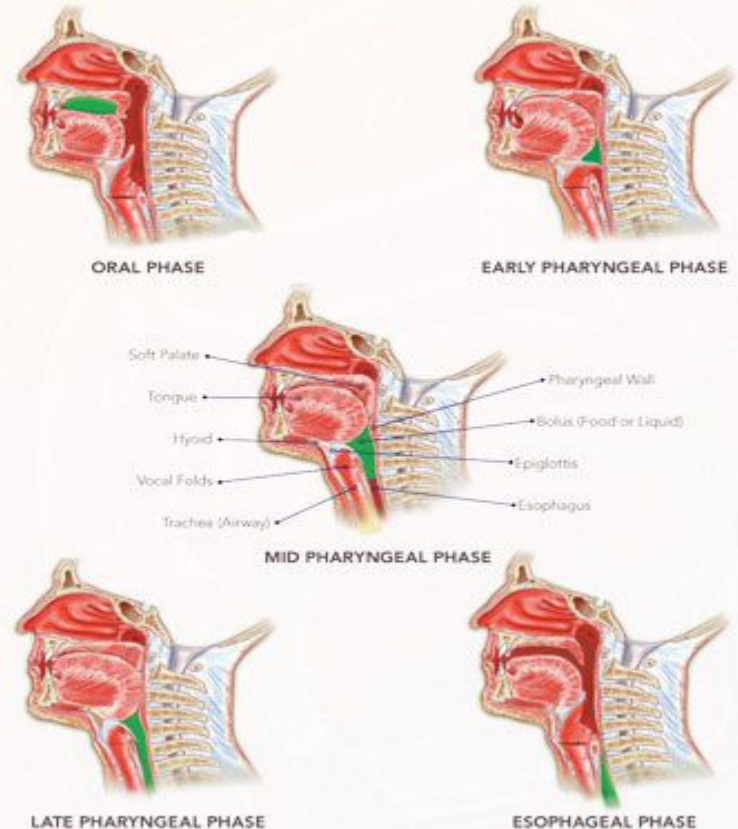
What is the Gut-Brain Connection?

- **Definition:** The gut-brain connection refers to the bidirectional communication system between the brain and the gastrointestinal tract. The central nervous system (CNS) and enteric nervous system (ENS) exchange signals via neural, hormonal, and immune pathways. 
- **Relevance to Swallowing:** Efficient swallowing requires coordination between the brain and the GI tract. Disruptions in this communication can contribute to dysphagia. Additionally, stress and anxiety can negatively affect swallowing, as seen in functional dysphagia.
- **Key components:**
 - **Vagus Nerve:** The main nerve facilitating communication between the brain and the digestive system. It plays a critical role in controlling involuntary functions such as swallowing, peristalsis, and gastric motility.
 - **Enteric Nervous System (ENS):** Often called the “second brain” consists of approx 100 million neurons in the gut that regulate digestive processes.
 - **Neurotransmitters and Hormones:** Serotonin (90% produced in the gut), dopamine, and other signaling molecules impact both brain function and digestive health

Overview of Dysphagia

- **Definition:** Dysphagia is defined as difficulty in swallowing that can occur at any stage of the swallowing process. It may be a symptom of an underlying condition, such as neurological diseases, trauma, or cancer.
- **Types of dysphagia:**
 - **Oropharyngeal dysphagia:** occur in mouth or throat,
 - **Esophageal dysphagia:** occur in esophagus
 - **Functional dysphagia:** ?

NORMAL SWALLOWING



Nutrition and Dysphagia

Impact on Nutrition

Dysphagia can severely impact a person's ability to consume food and fluids safely, leading to malnutrition, dehydration, and weight loss. Safe swallowing is essential for adequate nutritional intake

AND

adequate nutritional intake is essential for safe swallowing.

Risks of Malnutrition

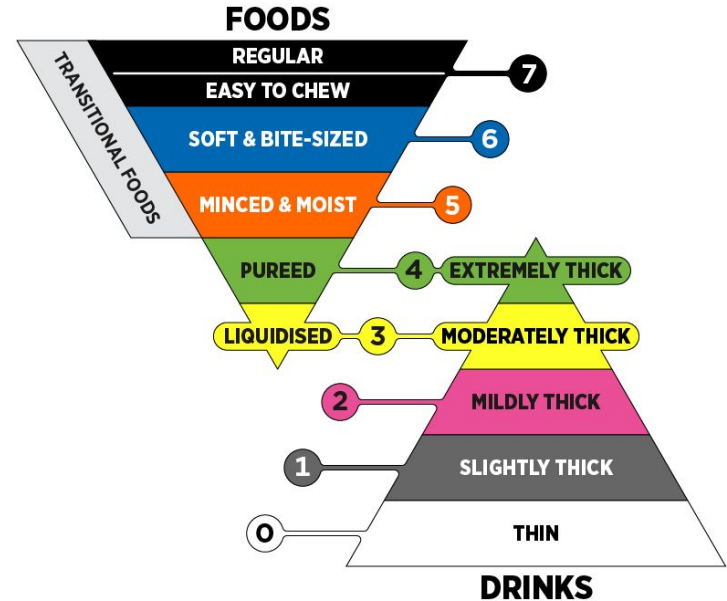
- **Poor Wound Healing:** A lack of essential nutrients can slow the body's ability to heal wounds. Generalized healing is also greatly impaired (infection, illness, etc)
- **Increased Risk of Infection:** Malnutrition weakens the immune system, leaving a person more susceptible to infections, including respiratory infections due to aspiration.
- **Fatigue and Muscle Weakness:** A poor diet can lead to muscle wasting, which not only affects general mobility but also further complicates swallowing mechanics.

Dysphagia Diets

IDDSI: International Dysphagia
Diet Standardization Initiative

The IDDSI Framework

Providing a common terminology for describing food textures and drink thicknesses to improve safety for individuals with swallowing difficulties.



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Role of SLPs in Dysphagia Management

- **Assessment:** to determine the severity of dysphagia, the type of dysphagia, and level of risk.
 - Clinical evaluation: aka: bedside swallow eval
 - Instrumental evaluation: MBS, FEES
 - Esophageal testing procedures: EGD, Manometry, Bravo (not SLP)
- **Intervention:** SLPs design individualized treatment plans based on needs which include exercises to strengthen swallowing muscles and strategies to promote safety and efficiency of swallowing.
- **Ongoing monitoring:** SLPs continuously evaluate swallowing function and adapt treatment plans over time.
- **Education:** SLPs train patients, caregivers, and healthcare teams on safe swallowing strategies and the importance of adhering to recommended diet modifications.

SLPs in Nutrition Management

Collaboration drives success

- SLP and Dietitian in association:
 - Assessment of nutritional needs and swallowing needs
 - Development of modified diets
 - Hydration management
 - Patient and Caregiver education
 - Ongoing monitoring and adjustment.
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By working together, dietitians and SLPs provide a coordinated approach that maximizes patient safety and ensures adequate nutrition, promoting recovery and improving quality of life.



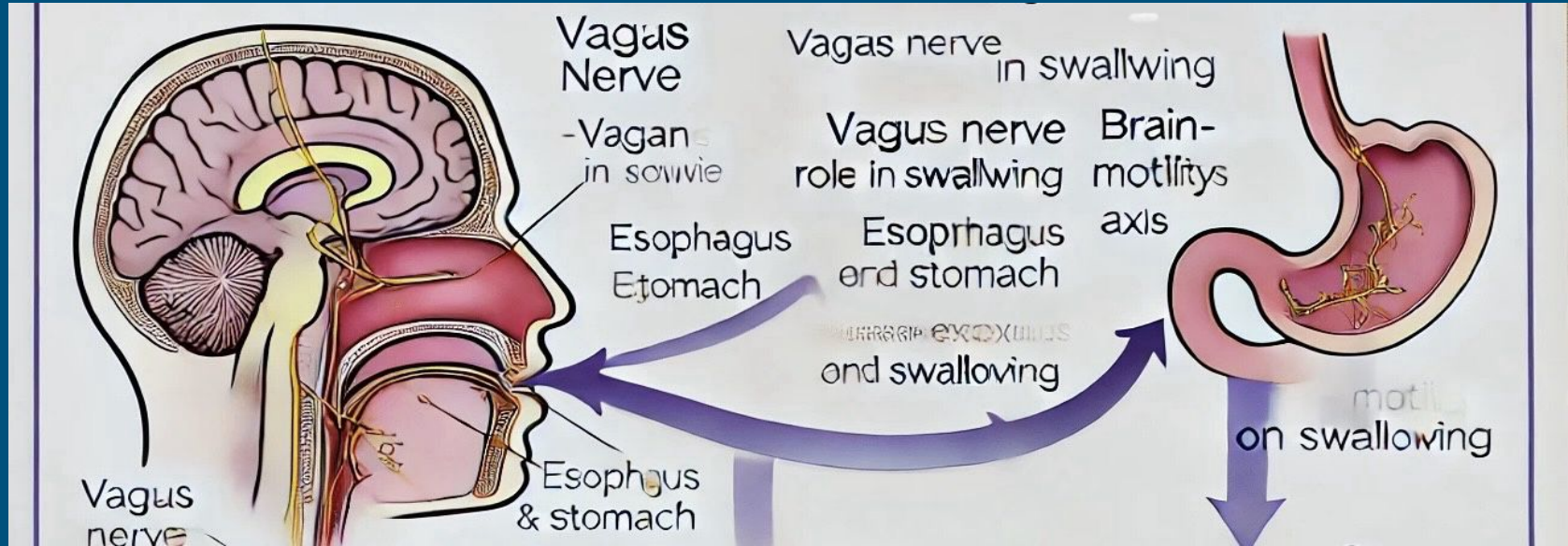
The Gut-Brain-Swallowing Connection in Dysphagia

How the Gut-Brain Axis affects Swallowing

- **Neural Pathways:** The vagus nerve, as part of the gut-brain Axis, plays a vital role in regulating involuntary muscle movements involved in swallowing, including esophageal peristalsis.
- **Emotional Influence:** Anxiety and stress mediated by gut-brain interactions, can worsen dysphagia. Stress often triggers physiological changes that affect gut motility, increasing swallowing difficulties
- **Psychogenic Dysphagia ie: Functional Dysphagia:** Some people develop swallowing difficulties without an identifiable physical cause. This may be linked to stress, anxiety, or other emotional factors affecting the gut-brain axis.

Neurological Disorders

- Conditions like Parkinson's disease, stroke, or multiple sclerosis disrupt the brain's control over swallowing muscles and gut motility. People with these conditions often experience both swallowing difficulties and digestive issues, requiring comprehensive management



Techniques SLPs Use to Improve Swallowing

- **Compensatory Strategies:**
 - Postural adjustments-body, head and neck, oral
 - Controlled bite size and rate of intake
- **Swallowing Exercises:**
 - Exercises and maneuvers are specifically designed for improvement in strength, coordination, and range of movement of specific muscles of swallowing.
- **Sensory Stimulation:**
 - Cold, warm, sour, spicy, or carbonation may stimulate a stronger and more timely swallowing reflex, particularly for people with delayed or weak reflexes

Case Study Example

- Patient profile: 26 y/o female with recent diagnosis of GERD, essentially normal EGD with mild inflammation of esophagus, normal manometry, “normal” MBS. Testing for EOE negative.
 - Initial symptoms: food feeling stuck, slight difficulty initiating swallow especially with solid foods, moderate food avoidance (solids), weight loss.
- Fast forward 6 months: increased “food stuck” sensations, severe difficulty initiating swallow, severe food avoidance-liquids only, 30lb weight loss, multiple trips to ER due to sensations of food stuck with all testing “normal”
- Avoidance of social events, family meals, unable to eat lunch at work, mental fog, limited overall endurance.

Clinical work-up

6 months post procedures

- **Swallowing assessment**
 - oral phase: mild pocketing on L, mildly delayed bolus transport, separation of bolus into 2 swallows
 - pharyngeal phase: delay of swallow initiation, moderate decreased laryngeal excursion, throat clearing after swallow, % food “stuck,” % bad taste in mouth, slight “gurgly” vocal quality after swallow
- **Nutrition assessment**
 - Severe wt loss
 - Reduced muscle mass
 - Reduced food intake
 - Food avoidance
 - Decreased protein intake
 - Increased carbohydrate/sugar intake



Interventions: we will begin “where she is” not where she should be

- **Nutrition** first...
 - Increase protein
 - Increase fiber
 - Increase fat
 - Multivitamin and other micronutrient supplementation
- **Swallowing**
 - Strategies for swallow initiation
 - Sensory desensitization
 - Exercises for laryngeal elevation and excursion
 - After several visits identified long standing history (since childhood) of not being able to eat in public/with other people.

Progress:

- Increased intake with adjustments to macro nutrients at liquified and pureed level
- Increased ability to trial foods with texture, as nutritional status improved, less complaints of food “sticking”
- After 3 months increased to soft and bite sized diet. Stable nutritional intake of a variety of foods.
- After 5 months, she and her husband announced much anticipated and wanted pregnancy!!

Outcomes and Research on SLP Impact

Evidence based practice

- SLPs play a crucial role in preventing malnutrition by promoting safe swallowing through dietary modifications and therapy.
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Quality of Life Improvements

- People who receive effective dysphagia management report higher satisfaction with their meals, reduced anxiety around eating, and better overall health
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Long Term Impact

- Timely intervention by SLP/RD can reduce hospitalizations related to aspiration pneumonia, malnutrition, and dehydration, particularly in the neurologically impaired, but also in the underserved “normal” swallowing/dysphagia population.
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The Future of Dysphagia and Gut-Brain Research

- **Emerging research:** ongoing studies continue to uncover Gut-Brain influence on swallowing and GI motility. Understanding this connection can lead to better, more targeted dysphagia treatments.
- **Technological Advancements:** for swallowing
 - Swallowing Sensors:
 - Biofeedback Tools:
- **Expanding Roles of SLPs** - SLPs are increasingly involved in complex cases where a dysphagia is not easily identified, yet is chronic and impacts both swallowing and digestion.

Summary:

- The gut-brain connection plays a significant role in coordinating swallowing and digestion. For one to improve, you must address both.
- Dysphagia, caused by various conditions, severely impacts a person's nutritional status and overall health
- SLPs along with dietitians play a central role in diagnosing and treating dysphagia ensuring safe swallowing and maintaining adequate nutrition through diet modifications, therapy, and collaborative care
- Interventions significantly reduce the risks associated with dysphagia such as aspiration and malnutrition, and improve long term outcomes and quality of life.

