




## SPEECH, LANGUAGE AND SWALLOWING DIFFICULTIES IN PWMS – MEDICAL & PSYCHOSOCIAL IMPLICATIONS

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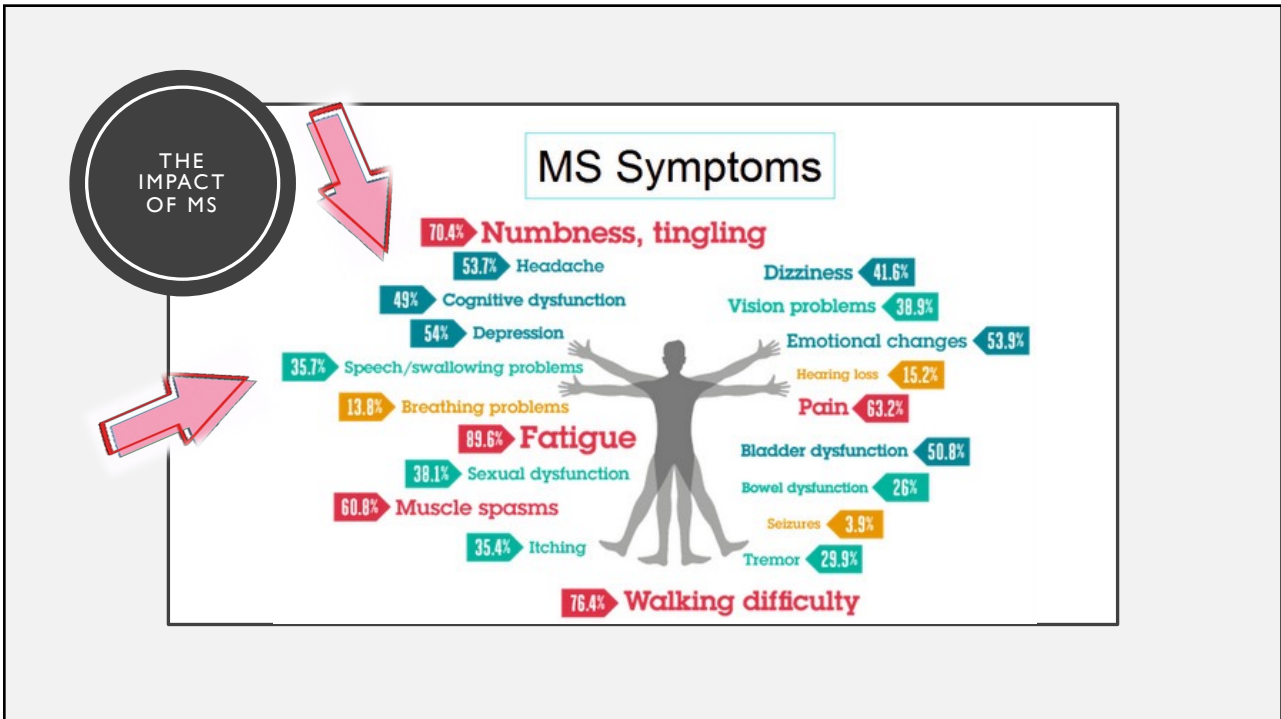
May 18, 2023







1



2

**national**  
**May 18<sup>th</sup> is National Speech Pathologist Day!**

- The holiday was created to recognize healthcare professionals who specialize in the treatment of communication, cognitive-communication, voice, and swallowing disorders.
- Speech pathologists, also known as **speech-language pathologists (SLPs)**, are clinicians who specialize in the evaluation, diagnosis, and treatment of a wide range of speech, language, and swallowing disorders. Since such disorders can result from a variety of causes, SLPs often work closely with audiologists, optometrists, occupational therapists, physical therapists, social workers, rehabilitation psychologists, and other health professionals.
- There is a misconception that SLPs specialize exclusively in the treatment of articulation disorders and stutter. However, speech-language pathology is concerned with a **broad scope of issues** involved in communication.
- SLPs provide expertise and services in multiple areas, which include speech, language, cognitive aspects of communication, augmentative and alternative communication, voice, swallowing, and sensory awareness related to swallowing or communication.
- Speech-language pathology started to emerge in the 17th century, but its active development in the United States began in the early 1920s, when soldiers returned home from World War I. Many of those who had suffered traumatic brain injuries during the war developed language difficulties and needed professional help.
- In 1925, the American Academy of Speech Correction (now the American Speech-Language-Hearing Association, ASHA) was established to promote "scientific, organized work in the field of speech correction").
- To work as a SLP in the US, you must minimally hold a master's degree in speech-language pathology / communicative disorders from a university with regional accreditation and a program accredited by the ASHA, complete 400+ clinical hours, pass multiple comprehensive exams, and receive a state license and national certification.

**SLP**  
**LANGUAGE**  
**PATHOLOGIST**  
**Day**

4

MEDICAL SLP: THE BIG 9

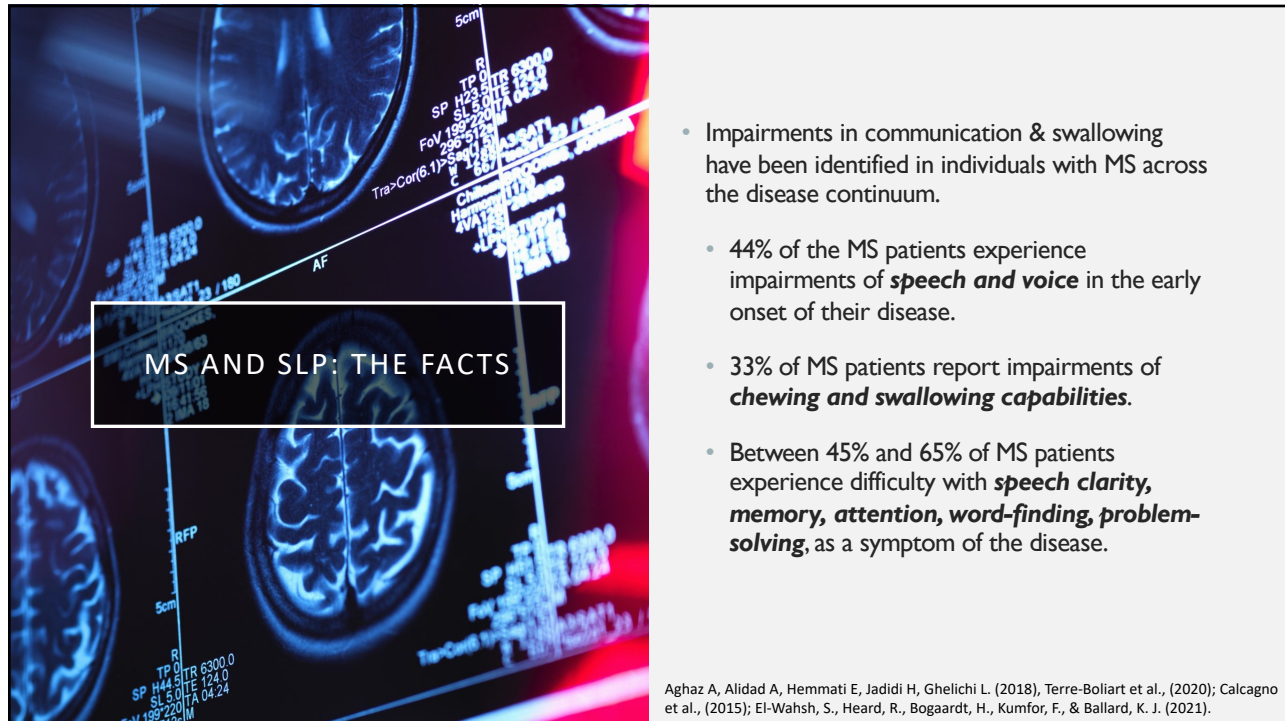
## The Big 9 of SLP (ASHA)

The 9 areas impacting communication and swallowing.

"Speech-Language Pathologists prevent, assess, diagnose, and treat speech, language, social communication, cognitive-communication, and swallowing disorders in children and adults."

+ Social aspects of communication  
 + Communication modalities

5



**MS AND SLP: THE FACTS**

- Impairments in communication & swallowing have been identified in individuals with MS across the disease continuum.
- 44% of the MS patients experience impairments of **speech and voice** in the early onset of their disease.
- 33% of MS patients report impairments of **chewing and swallowing capabilities**.
- Between 45% and 65% of MS patients experience difficulty with **speech clarity, memory, attention, word-finding, problem-solving**, as a symptom of the disease.


Aghaz A, Alidad A, Hemmati E, Jadidi H, Ghelichi L. (2018), Terre-Boliart et al., (2020); Calcagno et al., (2015); El-Wahsh, S., Heard, R., Bogaardt, H., Kumfor, F., & Ballard, K. J. (2021).

6

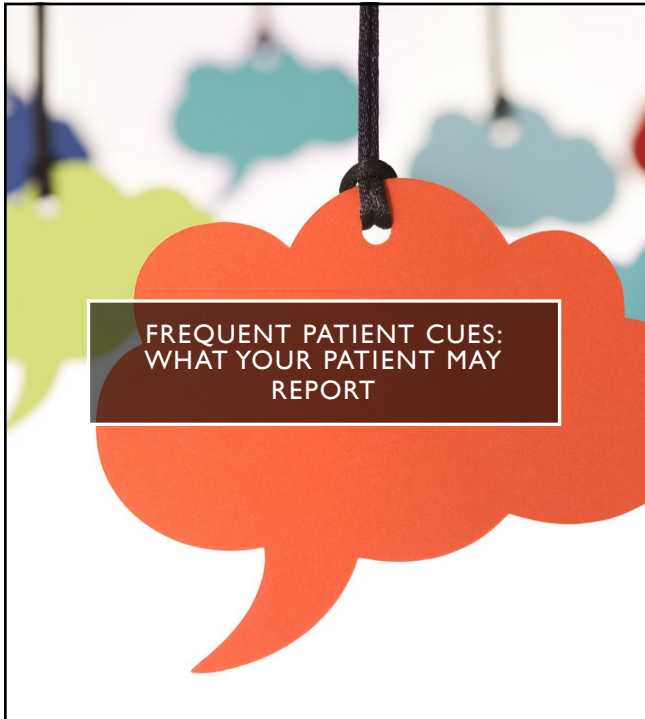


**REFERRAL FOR TREATMENT**

- Despite the high occurrence of communication disorders associated with MS:
  - Only 2% of MS patients are appropriately referred for speech, voice & swallowing treatment.
  - Less than 1% of patients receive appropriate cognitive intervention (Hartelius & Svensson, 1994).
  - **REFERRAL FOR PATIENTS ON ORAL FORMULATION DISEASE MODIFYING THERAPY IS DIRE.**
  - SLPs have an **ESSENTIAL** important role in MS rehabilitation.



7



**FREQUENT PATIENT CUES:  
WHAT YOUR PATIENT MAY  
REPORT**

“I feel like I have brain fog at the end of the day”

“I have a hard time keeping up at work”

“I have a constant tickle in my throat.”

“It takes a lot of concentration to keep up with a conversation”

“I’m constantly asked to repeat myself”

“Sometimes I have difficulty finding the right word. It’s on the tip of my tongue.”

“I lose my train of thought”

“I run out of air when talking”

“I don’t understand why my speech sounds sloppy.”

8



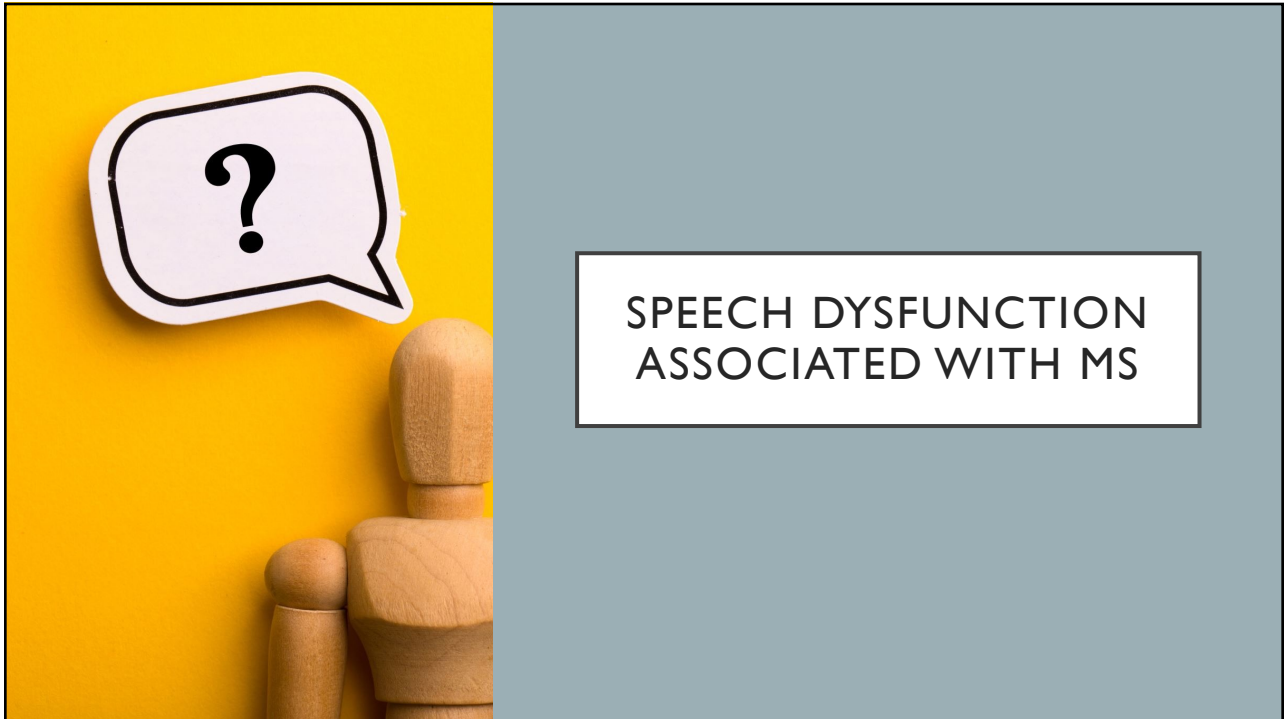
**AREAS OF SPECIALIZATION**

SPEECH & VOICE

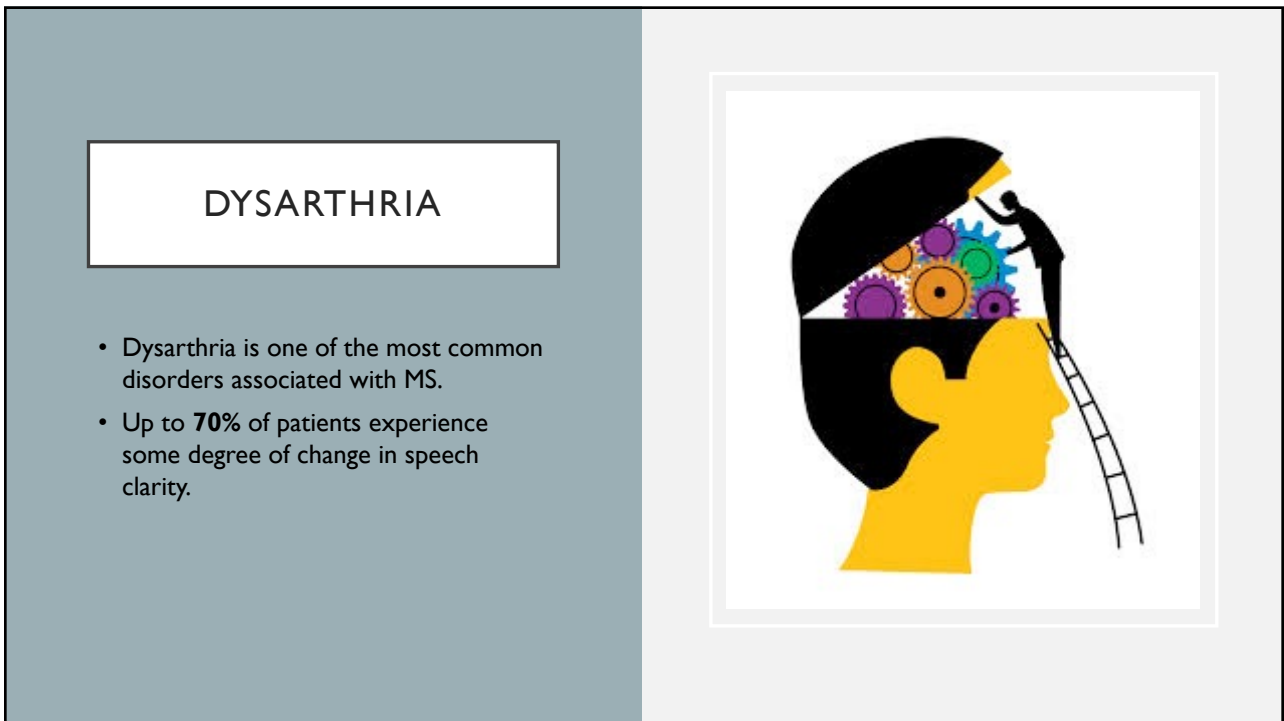
SWALLOWING (DYSPHAGIA)

LANGUAGE & COGNITION


9



10



11



## DEFINITION

**Dysarthria**

- A neurological, motor speech disorder characterized by slow, weak, or uncoordinated movements of the speech musculature.
- Speech musculature: lungs, vocal folds, velum, tongue, lips, nose and jaw.
- Often respiratory and articulatory muscles become disordered resulting in poorly articulated or “slurry” sounding speech with a pressed vocal quality and reduced vocal volume.
- Dysarthria results in reduced speech intelligibility (clarity) and communicative function.
  - **It is a common cause of social isolation & depression.**

12

CHANGES  
IN  
SPEECH &  
VOICE IN  
PWMS

**TABLE 1**  
**Rank Order of Deviations in Speech and Voice in Multiple Sclerosis**

Percent (N=168)	Deviation	Description
77%	Loudness control	Reduced, mono, excess, or variable
72%	Harsh voice quality	Strained, excess tone in vocal cords
46%	Imprecise articulation	Distorted, prolonged, irregular
39%	Impaired emphasis	Phrasing, rate, stress, intonation
37%	Impaired pitch control	Monopitch, pitch breaks, high, low
35%	Decreased vital capacity	Reduced breath support and control
24%	Hypernasality	Excessive nasal resonance

13

## DYSARTHRIA

- Dysarthria can occur in two contexts:
  - **Episodic dysarthria**- dysarthria lasts for a few minutes to an hours and recurs several times during the day, during periods of high fatigue.
  - **Consistent dysarthria**- symptoms of dysarthria persist throughout the day, day after day.

14

## CAUSE OF DYSARTHRIA



Changes in respiration occur due to deconditioning

Deconditioning is a result of ...

- Sedentary lifestyle (relatively common in MS)
- Underused respiratory system
- Disuse atrophy of respiratory muscles
- Poor positioning, scoliosis, kyphosis



Etiology: Interference along the upper motor neurons (usually bilaterally) and lesions within the cerebellum.

15

15

## DYSARTHRIA

### PERCEPTUALLY, SPEECH SOUNDS...

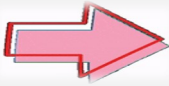
- sloppy
- imprecise
- uncoordinated
- effortful

### VOCAL QUALITY CAN SOUND...

- harsh
- hoarse
- breathy
- nasal

16

## IMPACT OF DYSARTHRIA

- Vocal weakness paired with reduced respiratory support causes significantly reduced vocal volume in MS.
  - Endurance for conversation and “running out of air” when communicating is commonly reported to interfere with employment, socialization and day-to-day communicative interactions.
  - FACT: On average, PWMS have an average vocal volume **8 dB SPL less** than a non neurological impaired adult.
- 
- What are the psychological impacts of dysarthria?
  - Dysarthria frequently induces social isolation, a decrease in quality of life, and alterations in employment, and daily-living activities.
  - Dysarthric deficits also increase the risk of developing psycho-emotional disorders such as depression and cognitive deterioration.

17



Comparative Study > [Neurodegener Dis.](#) 2019;19(1):12-21. doi: 10.1159/000499627.  
Epub 2019 May 21.

### Psychosocial Impact of Dysarthria: The Patient-Reported Outcome as Part of the Clinical Management





Cyril Atkinson-Clement <sup>1</sup>, Alban Letanneux <sup>2</sup>, Guillaume Baille <sup>3</sup>, Marie-Charlotte Cuartero <sup>4</sup>, Lauriane Véron-Delor <sup>4 5</sup>, Camille Robieux <sup>4</sup>, Manon Berthelot <sup>4</sup>, Danièle Robert <sup>4 6</sup>, Jean-Philippe Azulay <sup>7 8</sup>, Luc Defebvre <sup>3</sup>, Joaquim Ferreira <sup>9</sup>, Alexandre Eusebio <sup>7 8</sup>, Caroline Moreau <sup>3</sup>, Serge Pinto <sup>4</sup>

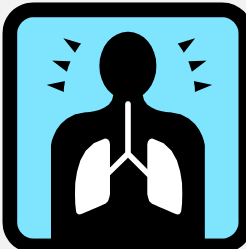
## GOOD NEWS: TREATMENT IS EFFECTIVE

- Dysarthria is a frequent and debilitating symptom of neurological disorders, and is from the patient perspective, a multidimensional symptom, impacting social and emotional daily-living components.
- However, the proportion of patients who access speech therapy have **significantly reduced psychosocial impact** than those who do not receive intervention.

18



## VOICE SAMPLES: SUSTAINED PHONATION

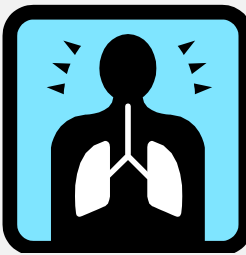
PRE-TREATMENT	POST-TREATMENT
 Participant 4	 Participant 4
 Participant 5	 Participant 5



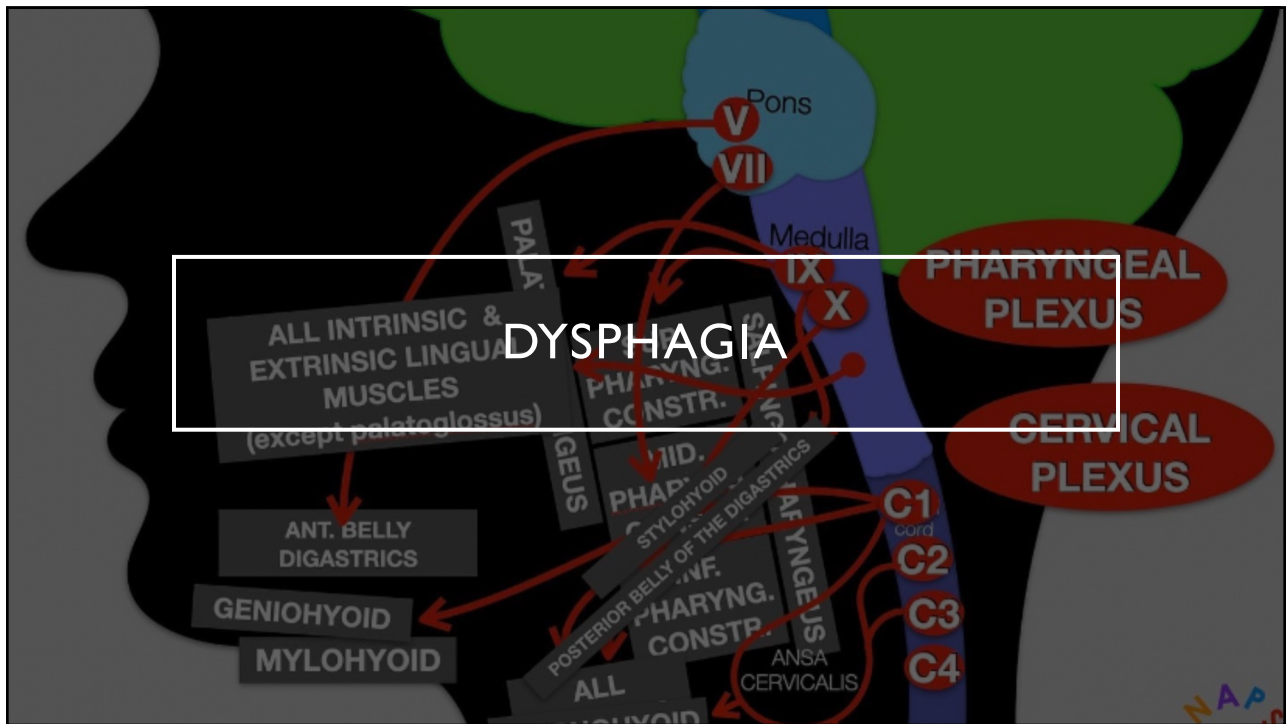
19

**SPEECH SAMPLES- CONVERSATION RECORDINGS**

<b>SESSION #1</b>	<b>SESSION #16</b>
<b>Participant 5</b> 	<b>Participant 5</b> 






20



21

## WHY ARE EATING AND DRINKING SO IMPORTANT?

-  How we get nourishment
-  Primary route for many medications
-  Involved in social aspects of life Birthday party, wedding, holidays, social events, etc.,

22

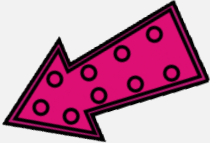
## SWALLOWING DYSFUNCTION IN MS

Dysphagia is the clinical term for impaired, or abnormal swallowing.

- It is not a disease it is a medical diagnosis associated with an underlying disease or disorder, such as MS, CVA or Parkinson’s disease.

Consultation with a MedSLP is essential. Unfortunately, many patients are not referred until the dysfunction is severe.

- Under referral is largely in part because patients often do not recognize the symptoms, doctors don’t always recognize the importance of early assessment and intervention and many MS rating scales are not sensitive to dysphagia.



23

## DYSPHAGIA & MS

Swallowing is a deceptively complex process!


Impaired swallowing function in PwMS is due the coexistence of:

- lesions in corticobulbar tracts,
- paresis of the cranial nerves,
- disorders of the cerebellum and brainstem,
- cognitive dysfunction.

This leads to:

- *Impaired physiological control*
- *Impaired biomechanics and bolus flow which reduces swallowing safety*
- *Impaired neural control as swallowing requires intact cortical and brainstem activation*
- *Feelings of fear and anxiety surrounding mealtime and nourishment.*

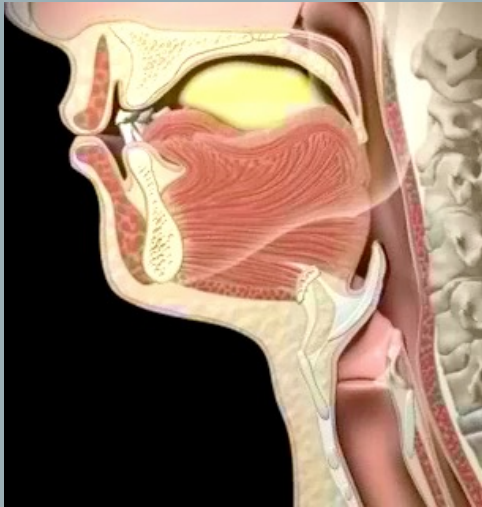
24



### DYSPHAGIA & MS: THE NUMBERS...

- **18 million** adults in the US have dysphagia.
- The prevalence of dysphagia in people with MS (PwMS) is conservatively estimated to be **43%** (Aghaz et al., 2018).
- There is a **40%** occurrence of silent aspiration patients with moderate-to-severe MS (Terre-Boliart et al., 2020).
- Although it is not typically the first sign of MS, dysphagia is observed in **mildly impaired** patients with low levels of disability.
  - The prevalence increases as the disease progresses, reaching as high as **65% in severely** disabled PWMS (Calcagno et al, 2015).
- Calcagno et al, (2015) imaging identified a **link between dysphagia and brainstem lesion load** – noting a prevalence of 34% of MS participants.

25



Credit: Groher & Crary (2021). ISBN: 978-0323636483

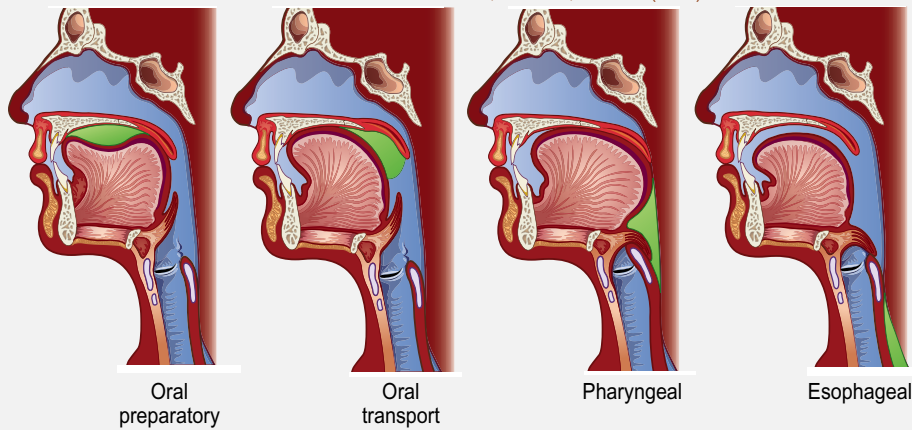
## ORCHESTRATION OF ANATOMY DURING THE NORMAL ACT OF SWALLOWING

Swallowing requires the activation and coordination of 50 pairs of muscles and 6 cranial nerves (V, VII, IX, X, XI, XII)<sup>1</sup>

1.O'Connor Wells (2022). ISBN: 978-1421442556

26

Photo: Hixon, Weismer, and Hoit (2013). ISBN: 978-1597565202



### The 4 Phases of Swallowing

- These phases describe the movements of the bolus (**green mass**) through the oral, pharyngeal, and esophageal segments of the swallowing apparatus
- *Bolus* = the mass of solid substance (food) or the volume of liquid to be swallowed (shown in green in the figures)

28

**VFSS:  
TYPICAL  
“NORMAL”  
SWALLOW**



Video Courtesy: Barrera and O'Connor Wells

29

**COMMON SIGNS & SYMPTOMS OF  
DYSPHAGIA**

- Coughing/clearing of throat
- Abnormal volitional cough
- Change in voice quality (wet, hoarse, weak)
- Chronic respiratory illness
- Multiple swallows/special maneuvers needed to clear throat
- Long mealtime (30+ mins.)
- Frequent low-grade fever, especially after meals
- Weight loss

- Malnutrition
- Dehydration
- Globus sensation or the feeling of food being stuck in the throat
- Needing diet modifications (e.g., thickening of liquids; pureed food, soft solids)
- Difficulty initiating a swallow
- Spillage of food/liquids from lips and/or drooling
- Regurgitation during or after meals

O'Connor Wells (2022). ISBN: 978-1421442556

30

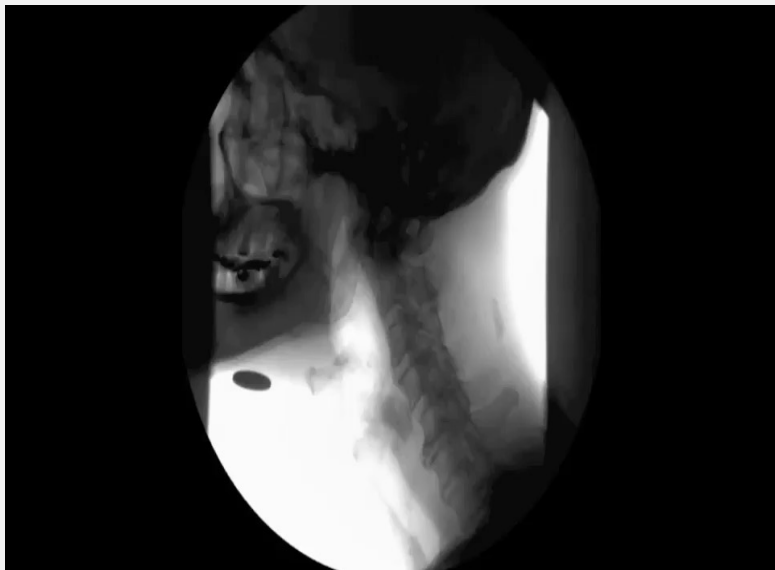
**WARNING! PROCEED WITH CAUTION!**

- Since the development of an oral formulation (pill) disease-modifying therapy (DMT) for MS and many more coming to market, PwMS now more than ever need to advocate and monitor the safety of their swallowing skills.




31

**VFSS WITH (SILENT) ASPIRATION**

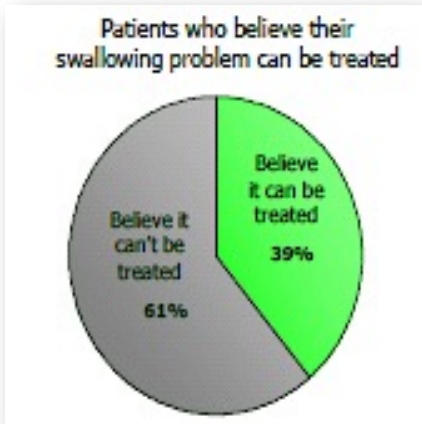


Video Courtesy: Barrera and O'Connor Wells

32



Patients who believe their swallowing problem can be treated



Belief	Percentage
Believe it can be treated	39%
Believe it can't be treated	61%

**N=360 MS patients with known complaints of dysphagia**

Source: Ekberg O, et al., Social and psychological burden of dysphagia: its impact on diagnosis and treatment. Dysphagia, 2002; 17:139-46

33

Eating Assessment Tool (EAT-10) developed by Peter C. Belafsky, MD, PhD.

- Published in the *Annals of Otolaryngology, Rhinology, & Laryngology* in 2008.

Online: <https://bit.ly/31OgCQu>  
 PDF: <https://bit.ly/2L8N2PD>

- Translated into Japanese, Spanish, Anatolian Turkish, Italian, Chinese, Portuguese, and more.
- ~5 mins to administer

EAT-10 is a self-administered or clinician facilitated, symptom-specific outcome instrument for swallowing.

- Consists of 10 statements that an individual rates on a scale of 0 - 4
- 0 = no problem to 4 = severe problem

The EAT-10 also serves as a valid outcome measure for dysphagia intervention.

- Frequently administer every 60-90 days to track progress.

LET'S SCREEN SWALLOWING:

EATING ASSESSMENT TOOL (EAT-10)

Belafsky (2008). DOI: 10.1177/000348940811701210.

34



## EATING ASSESSMENT TOOL (EAT-10)

A score  $\geq 3$  is abnormal and **can be** indicative of oropharyngeal dysphagia.<sup>1</sup>

Subjective dysphagia symptoms can predict risk for aspiration.

- Score of 15 or more indicates the patient is 2.2 times more likely to aspirate.<sup>2</sup>

1.Hansen (2020). DOI:[10.1186/s12955-020-01384-2](https://doi.org/10.1186/s12955-020-01384-2)  
 2.Cheney (2015). DOI: [10.1177/0003489414558107](https://doi.org/10.1177/0003489414558107)  
 3.Belafsky (2008). DOI: [10.1177/000348940811701210](https://doi.org/10.1177/000348940811701210).

EATING ASSESSMENT TOOL (EAT-10)

Date: \_\_\_\_\_

Name: \_\_\_\_\_ MR#: \_\_\_\_\_

Height: \_\_\_\_\_ Weight: \_\_\_\_\_

Please briefly describe your swallowing problem.

\_\_\_\_\_

\_\_\_\_\_

Please list any swallowing tests you have had, including where, when, and the results.

\_\_\_\_\_



\_\_\_\_\_

To what extent are the following scenarios problematic for you?

Circle the appropriate response	0 = No problem 4 = Severe problem				
1. My swallowing problem has caused me to lose weight.	0	1	2	3	4
2. My swallowing problem interferes with my ability to go out for meals.	0	1	2	3	4
3. Swallowing liquids takes extra effort.	0	1	2	3	4
4. Swallowing solids takes extra effort.	0	1	2	3	4
5. Swallowing pills takes extra effort.	0	1	2	3	4
6. Swallowing is painful.	0	1	2	3	4
7. The pleasure of eating is affected by my swallowing.	0	1	2	3	4
8. When I swallow food sticks in my throat.	0	1	2	3	4
9. I cough when I eat.	0	1	2	3	4
10. Swallowing is stressful.	0	1	2	3	4
<b>Total EAT-10:</b>					

Belafsky PC, Mouadeb DA, Rees CJ, Fryer JC, Postma GN, Allen J, and Leonard RJ. Validity and reliability of the Eating Assessment Tool (EAT-10). *Ann Otol Rhinol Laryngol* 117: 919-924, 2008.

35

### ADVOCATE: WHY IS DYSPHAGIA EVALUATION & MANAGEMENT SO IMPORTANT?

- **No room for error! Stakes are high!**
- **Consequences of dysphagia:**
  - Choking - airway compromise
  - Tracheostomy
  - Malnutrition/dehydration
  - Weight loss
  - Chronic respiratory illness
  - PEG, NG, OG, or G Tube/J Tube Placement
  - Aspiration- respiratory distress, pneumonia
  - Death

36

## Hot Topic: Is Benign Multiple Sclerosis Ever Benign?



Cognitive impairment, fatigue and depression in multiple sclerosis: Is there a difference between benign and non-benign MS?

Hans Bogaardt<sup>a,\*</sup>, Daniel Golan<sup>b,c</sup>, Marissa A Barrera<sup>d</sup>, Stacie Attrill<sup>e</sup>, Olivia Kaczmarek<sup>e</sup>, Myassar Zarif<sup>f</sup>, Barbara Bumstead<sup>g</sup>, Marijean Buhse<sup>h,i</sup>, Jeffrey Wilken<sup>h,i</sup>, Glen M Doniger<sup>j</sup>, Laura M Hancock<sup>k</sup>, Iris-Katharina Penner<sup>l</sup>, June Halper<sup>l</sup>, Sarah A Morrow<sup>m</sup>, Thomas J Covey<sup>n,o</sup>, Mark Gudesblatt<sup>o</sup>

## EARLY INTERVENTION

- 141 persons with BMS (PwBMS)
- Results: Cognitive impairment (38%), fatigue (78%), and depression (55%) were common among people with an EDSS-based definition of benign MS (score of less than 3).
- Data suggests that only a small fraction of PwMS will likely have disease progression **without** any visible/invisible symptoms, which questions further use of the term 'benign MS.'
- Action: Early and routine cognitive testing would improve awareness and better understanding of the impact of BMS.

37

	Acute Care	In-Patient Rehab	Outpatient	Home Health	Long-term Care
<b>OT</b>	Address safety, ADLs and equipment needed to go home, education and support for caregivers	Same as acute care but with emphasis on higher frequency, intensity focused on independence and improved function	Self management that includes freq and intensity, chronic disease management, address work issues, education and support for caregivers, advocacy	Safety, transfers, evaluation and setting up assistance with ADLs, education and support for caregivers, advocacy, self management	mobility assessments, pressure management, ADLs, education and support for caregivers, leisure
<b>PT</b>	Address safety, bed mobility, transfers and mobility needed for discharge	Intensive therapy targeting specific impairments and endurance	Preventative wellness planning as well as restorative bouts of care focused on specific functional limitations and participation restrictions	Bed Mobility and transfers; fall prevention; functional set-up for ADLs; balance training	Address deconditioning, build endurance, build strength
<b>SLP</b>	Address swallow safety, cognitive function for basic ADLs, functional communication needed for discharge	Higher intensity (5-6 days per week for 2-4 weeks) targeting specific deficits or changes secondary to medical reason for admission	Preventative and restorative program changing in frequency/intensity still at times. Chronic disease management focusing on function for work, home, social life. On and off throughout the year versus one short intensive bout.	Focus on safety and interaction with home environment. External aid set-up for cognition in natural environment.	Swallow safety, cognitive engagement, functional communication with staff, other residents, and family.

## BENEFITS OF MS REHABILITATION

38

Speech, language & swallowing dysfunction occur in with PWMS, however treatment can be effective.

The skills and expertise of medical speech-language pathologists are underutilized in MS care.

The use of telehealth is a beneficial tool for providing speech & swallowing services to persons with MS.

There are many inexpensive and cost-effective therapeutic treatments available for swallowing (and speech) dysfunction.

**DON'T ALLOW CHANGES IN COMMUNICATION AND SWALLOWING TO WITHDRAW PWMS FROM CONVERSATIONS, SOCIAL INTERACTIONS AND REDUCE QUALITY OF LIFE!**

**Take away!**

39

**Thank you!**

**LET'S STAY CONNECTED!**



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[www.nyneuroslp.com](http://www.nyneuroslp.com)

40