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

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THE IMPACT OF MS

MS Symptoms

- Numbness, tingling (10.4%)
- Headache (57.7%)
- Cognitive dysfunction (45%)
- Depression (54%)
- Speech/swallowing problems (35.7%)
- Breathing problems (13.8%)
- Fatigue (69.6%)
- Sexual dysfunction (38.1%)
- Muscle spasms (69.8%)
- Itching (35.1%)
- Walking difficulty (78.4%)

- Dizziness (41.6%)
- Vision problems (38.8%)
- Emotional changes (53.9%)
- Hearing loss (15.2%)
- Pain (51.2%)
- Bladder dysfunction (50.8%)
- Bowel dysfunction (28%)
- Seizures (3.9%)
- Tremor (29.5%)
May 18th 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.

MEDICAL SLP: THE BIG 9

The 9 areas impacting communication and swallowing.

- Cognition
- Receptive / Expressive Language
- Hearing
- Fluency
- Articulation
- Swallowing
- Voice + Resonance
- Social aspects of communication
- Communication modalities

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

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.
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.”

AREAS OF SPECIALIZATION

SPEECH & VOICE

SWALLOWING (DYSPHAGIA)

LANGUAGE & COGNITION
SPEECH DYSFUNCTION ASSOCIATED WITH MS

DYSARTHRIA

- Dysarthria is one of the most common disorders associated with MS.
- Up to 70% of patients experience some degree of change in speech clarity.
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.*

### TABLE 1

<table>
<thead>
<tr>
<th>Percent (N=168)</th>
<th>Deviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>77%</td>
<td>Loudness control</td>
<td>Reduced, mono, excess, or variable</td>
</tr>
<tr>
<td>72%</td>
<td>Harsh voice quality</td>
<td>Strained, excess tone in vocal cords</td>
</tr>
<tr>
<td>46%</td>
<td>Imprecise articulation</td>
<td>Distorted, prolonged, irregular</td>
</tr>
<tr>
<td>39%</td>
<td>Impaired emphasis</td>
<td>Phrasing, rate, stress, intonation</td>
</tr>
<tr>
<td>37%</td>
<td>Impaired pitch control</td>
<td>Monopitch, pitch breaks, high, low</td>
</tr>
<tr>
<td>35%</td>
<td>Decreased vital capacity</td>
<td>Reduced breath support and control</td>
</tr>
<tr>
<td>24%</td>
<td>Hypernasality</td>
<td>Excessive nasal resonance</td>
</tr>
</tbody>
</table>
Dysarthria can occur in two contexts:

- **Episodic dysarthria** - dysarthria lasts for a few minutes to an hour and recurs several times during the day, during periods of high fatigue.

- **Consistent dysarthria** - symptoms of dysarthria persist throughout the day, day after day.

**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.
**DYSARTHRIA**

**PERCEPTUALLY, SPEECH SOUNDS...**
- sloppy
- imprecise
- uncoordinated
- effortful

**VOCAL QUALITY CAN SOUND...**
- harsh
- hoarse
- breathy
- nasal

**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.
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.

VOICE SAMPLES: SUSTAINED PHONATION

**PRE-TREATMENT**
- Participant 4
- Participant 5

**POST-TREATMENT**
- Participant 4
- Participant 5
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.,

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.
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.

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

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).
VFSS: TYPICAL "NORMAL" SWALLOW

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

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.

VFSS WITH (SILENT) ASPIRATION

Video Courtesy: Barrera and O'Connor Wells
**Eating Assessment Tool (EAT-10)** developed by Peter C. Belafsky, MD, PhD.

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

**Online:** [https://bit.ly/31QgCQu](https://bit.ly/31QgCQu)


- 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.

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**LET'S SCREEN SWALLOWING:**

**EATING ASSESSMENT TOOL (EAT-10)**

A score ≥ 3 is abnormal and can be indicative of oropharyngeal dysphagia. 

Score of 15 or more indicates the patient is 2.2 times more likely to aspirate. 


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EATING ASSESSMENT TOOL (EAT-10)

Subjective dysphagia symptoms can predict risk for aspiration.

To what extent are the following scenarios problematic for you?

Circle the appropriate response

<table>
<thead>
<tr>
<th>Scenario</th>
<th>0 - No problem</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4 - Severe problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My swallowing problem has caused me to lose weight.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. My swallowing problem interferes with my ability to eat for meals.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Swallowing liquids takes extra effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Swallowing solids takes extra effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Swallowing pills takes extra effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Swallowing is painful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. The pleasure of eating is affected by my swallowing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. When I swallow food sticks in my throat.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I cough when I eat.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Swallowing is stressful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Total EAT-10:

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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

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Hot Topic: Is Benign Multiple Sclerosis Ever Benign?

• 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.

BENEFITS OF MS REHABILITATION

<table>
<thead>
<tr>
<th>Acute Care</th>
<th>In-Patient Rehab</th>
<th>Outpatient</th>
<th>Home Health</th>
<th>Long-term Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT</td>
<td>Address safety, ADLs and equipment needed to go home, education and support for caregivers</td>
<td>Safety, transfers, evaluation and setting up assistance with ADLs, education and support for caregivers, advocacy</td>
<td>Safety, transfers, evaluation and setting up assistance with ADLs, education and support for caregivers, advocacy, self management</td>
<td>Mobility assessments, pressure management, ADLs, education and support for caregivers, leisure</td>
</tr>
<tr>
<td>PT</td>
<td>Address safety, bed mobility, transfers and mobility needed for discharge</td>
<td>Intensive therapy targeting specific impairments and endurance</td>
<td>Preventative wellness planning as well as restorative bouts of care focused on specific functional limitations and participation restrictions</td>
<td>Bed Mobility and transfers; full prevention; functional set-up for ADLs; balance training</td>
</tr>
<tr>
<td>SLP</td>
<td>Address swallow safety, cognitive function for basic ADLs, functional communication needed for discharge</td>
<td>Higher intensity (3-6 days per week for 2-4 weeks) targeting specific deficits or changes secondary to medical reason for admission</td>
<td>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.</td>
<td>Focus on safety and interaction with home environment. External aid set-up for cognition in natural environment.</td>
</tr>
</tbody>
</table>

Swallow safety, cognitive engagement, functional communication with staff, other residents, and family.
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!

Thank you!

LET'S STAY CONNECTED!

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