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Neurogenic Dysphagia in Older Adults with Motor Disorders: Part 1

Jeanna Winchester, PhD

Moderated by:
Amy Hansen, MA, CCC-SLP, Managing Editor, SpeechPathology.com

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Neurogenic Dysphagia in Older Adults with Motor Disorders: Part 1

Jeanna Winchester PhD

Clinical Scientist, Professor of Medicine, Author, Psychology, Allied-Health & CME/CEU/CPD Instructor in the USA, UK, Australia, Canada & the Caribbean

- **Presenter Disclosure:** Financial: Jeanna Winchester was paid an honorarium for this presentation. She owns a firm that provides continuing education and consulting services to healthcare professionals. Nonfinancial: Jeanna has authored articles related to this topic.
- **Content Disclosure:** This learning event does not focus exclusively on any specific product or service.
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Learning Outcomes

After this course, participants will be able to:

- List the bodily systems involved in the swallow and describe their breakdown in dysphagia.
- Describe the relationship of the neurological and cognitive systems to the swallow and dysphagia.
- Describe the relationship between neurogenic dysphagia and hospital readmission rates.

Dysphagia & Aspiration Risk

- Dysphagia is a sequela of many chronic and complex conditions such as stroke, Parkinson's disease (PD), and dementia, as well as the effects of advanced age
- Multiple studies have examined the prevalence of dysphagia in the community, and report rates of between 11 & 37.6%
- However, estimates dramatically increase for community-dwelling adults with health conditions known to be associated with dysphagia

Q1

Dysphagia & Aspiration Risk

- Aspiration pneumonia
  - The misdirection of oropharyngeal or gastric contents into the larynx and lower respiratory tract
- Aspiration is a general mechanism underlying the development of pneumonia associated with inhalation
- Even young, healthy individuals aspirate oral secretions, particularly during sleep
- If the volume of aspirated fluid is large or the defense mechanism is immunologically or medicophysically compromised, aspiration pneumonia can occur

Q2

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Aspiration Risk with COVID-19

- Thrush or other microbiomes in oral, pharyngeal, laryngeal or upper respiratory pathways
- Chest wall capacity
- Cough Reflex
- Oropharyngeal & laryngeal sensitivity & motor response
- Upper respiratory diseases vs. lower respiratory diseases
- Chronic (COPD) vs. Acute (Acute Asthma from scarring)
- Nutritional demands due to virus and previous dysphagia diagnosis
- Sarcopenia, underlying conditions, weight loss or gain and strength of coordinating structures of the swallow
- Admission recently to a skilled nursing facility
- Superinfections (e.g. MRSA, Cdiff, SIBO, etc.)

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Bodily Systems Affected by the Dysphagia

J. Winchester & C. Winchester (2015) AVAILABLE @www.jwphdllc.com/jwphd-publications

- Respiratory
  - Hold breath to execute swallow
- Neurological
  - Coordination of neurological, respiratory and motor interactions of the head, neck, chest cavity and abdominal structures involved in respiration & the swallow
- Cognitive
  - Coordinates & regulates experience
  - Awareness is more than just the swallow itself
- Gastrointestinal (Reflux is Dysphagia!)
- Muscular

Q3

There is an evolving & accelerating effect of dysphagia-related decline across the bodily systems of the swallow

COVID-19 Affects the Respiratory System of Dysphagia

- Oral
- Pharyngeal
- Laryngeal
- Tracheal
- Bronchial
- Lobar
- Cellular
- Long-term Consequences (e.g. tissue scarring)

Q4

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COVID-19 Affects the Neurological & Cognitive Systems of Dysphagia

- Fever and Neurological/Cognitive Function
- Fever and Mild Cognitive Impairment
- Fever and Dementia
  - Medical treatment compliance
  - Apathy, Aggression, Defiance, Depression, etc.

Q5

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COVID-19, Neuropsychiatric Consultations & Telehealth

- CMS released guidance on March 17, 2020
  - Allows patients to be seen via live videoconferencing in their homes
  - Do not need to travel to a qualifying "originating site" for Medicare telehealth encounters, regardless of geographic location
- Find out more at: www.psychiatry.org/psychiatrists/practice/telepsychiatry/blog/apa-resources-on-telepsychiatry-and-covid-19

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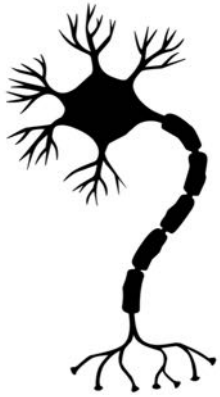
Defining Neurogenic Dysphagia

Winchester & Winchester 2015



- Evaluating the role of control over deglutition begins with the brainstem
- Polysynaptic input from many cortical areas into corticospinal fibers modifies the reflexive swallow, depending on the characteristics of the bolus being swallowed
- There is no specific cortical sidedness for deglutition control, but there is hemispheric dominance

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Defining Neurogenic Dysphagia

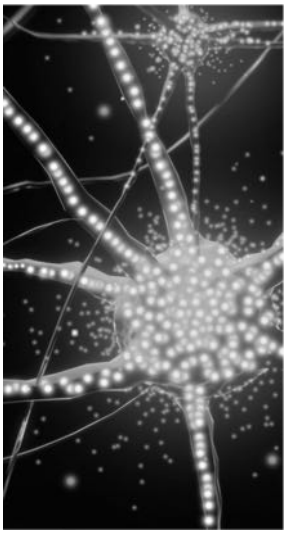
- The swallow involves the temporal arrangement of the oropharyngeal structures from a respiratory to a digestive pathway
  - The transfer of the bolus from the mouth to the esophagus
  - The recuperation of the respiratory configuration
    - We don't yet know the effects of COVID19 and respiratory scarring
- Sensory input by physiochemical properties of the bolus is required during bolus preparation to trigger and modulate deglutition

Defining Neurogenic Dysphagia

- Taste, pressure, temperature, nociceptive, and general somatic stimuli from the oropharynx and larynx are transported through cranial nerves to the brainstem's central pattern generator
- Then, acting as a short extension of the cortex, connecting the spinal cord to the thalamic/sub-thalamic and cortical regions

Defining Neurogenic Dysphagia

- The reticular formation of the brainstem plays an important role in regulating cortically mediated functions
  - By modifying cortically generated functions and integrating all sensorimotor stimuli with internally generated thoughts, emotions, and cognition
- Demonstrating the swallowing is a multiregional, multisensory and highly coordinated experience consisting of both the act as well as the perception of the experience



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Defining Neurogenic Dysphagia

- The reticular formation of the brainstem affects the regulation of respiration and the swallow
  - Via the pontine pneumotaxic center
  - Regulation of:
    - The trigeminal nerve (CN V)
    - The facial nerve (CN VII)
    - The glossopharyngeal nerve (CN IX)
    - The vagus nerve (CN X)
    - The hypoglossal nerve (CN XII)

Q6

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Defining Neurogenic Dysphagia

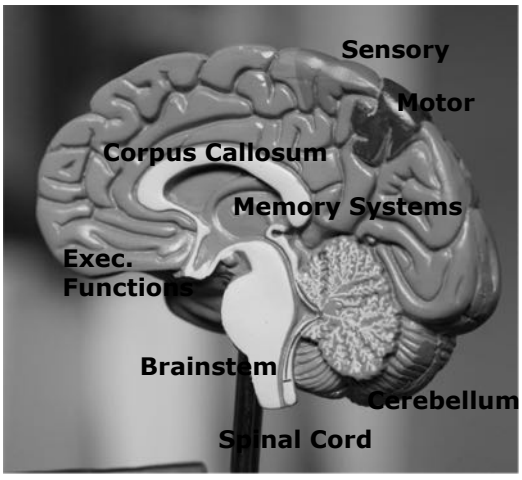
- The pontine pneumotaxic center regulates rhythm of the medullary respiratory center, controlling the basic inspiration and expiration rhythm and the depth, with feedback coming from the level of serum carbon dioxide
- These areas of the brainstem have widespread implications in the interaction of the neurological, respiratory and motor systems involved in the swallow & dysphagia

Defining Neurogenic Dysphagia

- The motor cortex, cerebellum, brainstem, cranial nerves, spinal nerves of the cervical/phrenic nerve plexus, and thoracic nerves affect the neuromuscular junctions of:
  - Face, larynx, tongue, pharynx
  - Diaphragm, shoulder, neck
  - External/internal intercostal muscles
  - Rectus abdominus, internal oblique, external oblique
  - Transverse abdominus

Defining Neurogenic Dysphagia

- Coordinating functioning of this system and overall perceptual awareness is central to safe deglutition



Case Study: Parkinson's Disease

- Substantia nigra
- Dopaminergic system impaired
  - Less dopamine relative to acetylcholine
- Degenerative motor disease
  - Tremor
  - Movement slowness (bradykinesia)
    Reduced muscular strength affecting motor speech and swallow
- PD's-associated dementia vs. Lewy Body Dementia to be discussed later…

Q7

Case Study: Parkinson's Disease

- Manifestations and Outcomes of Patients with Parkinson's Disease and Serious Infection in the Emergency Department
- Aim. To disclose the presentation and outcome of serious infection in patients with PD in the emergency department.
- Methods. This retrospective cohort study enrolled patients with PD who had serious infection and were admitted to the emergency department between January 2007 and December 2013
  - For clinical comparison, they compared the clinical features, laboratory data, and outcomes with those of age- and sex-matched patients who had serious infection but not PD

Su et al. (2018) BioMed Research International

Case Study: Parkinson's Disease

- Main Findings
  - There were a total of 1,200 episodes of infected PD patients and 2,400 age- and sex-matched infected patients without PD as disease controls
  - PD patients had fewer comorbidities and lower severity of infectious disease, but longer hospital stays than control group patients
  - The incidences of respiratory tract & urinary tract infections were higher in PD patients

Case Study: PD & Aspiration Pneumonia

- A number of video-fluoroscopic swallowing study (VFSS) abnormalities have been reported in patients with PD
- This study conducted a retrospective and case-control study to determine the clinically significant VFSS findings in this population, and to propose a practical scale for predicting aspiration pneumonia in patients with PD

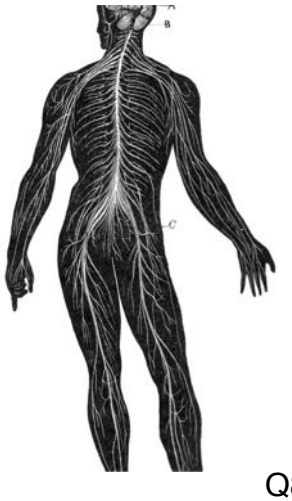
Tomita S, Oeda T, Umemura A, Kohsaka M, Park K, Yamamoto K, et al. (2018)

Case Study: PD & Aspiration Pneumonia

- Twenty-five patients developed aspiration pneumonia
- Affected swallow related mechanisms: mastication, lingual motility prior to transfer, aspiration, and total swallow time
- Significantly correlated with shorter time-to-death than controls (log rank P = 0.001)

Case Study: Huntington's Disease

- Degenerative Brain Disease that of dominant inheritance appearing in the mid-30s
- Areas affected include the caudate nucleus, putamen and cortex
- Huntington affects GABA resulting in an imbalance of dopamine and acetylcholine



Q8

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Case Study: Huntington's Disease

- The imbalance of dopamine and acetylcholine produces abnormal movements
- Dysarthria, chorea, personality changes and dementia
- There is no medical treatment for preventing the degenerative process in Huntington chorea, but dopamine receptor blockers have been used to control the choreic movements

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Case Study: Huntington's Disease

- Similar to other forms of neurogenic decline, fear and anxiety can plague the initial stages of Huntington's and there is a progressive loss of motor coordination as the disease progresses
- Cognitive decline does not necessarily follow the motor decline in a 1 to 1 fashion → they can decline at different rates
  - Make sure to take this into account for compensatory techniques
- Dysphagia risk increases as cognition declines

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Case Study: Huntington's Disease

- Management of Dysphagia in Huntington's disease: A Descriptive Review
- The present review provides an updated overview of the current knowledge on the assessment and treatment of dysphagia in HD.
- Since 2009, the number of studies investigating dysphagia in HD has increased and 24 studies have been included in the present review in addition to those of the previous review.
- However, only 10/24 studies were published in peer-reviewed journals
  - Thus, these data reflect the growing awareness of the scientific and clinical community on dysphagia in HD, but the topic is still poorly explored compared with its clinical relevance in this population

Pizzorni et al., (2020)

Case Study: Huntington's Disease

- Dysphagia should be assessed since the early stage of the disease
- In the presence of the clinical markers
- Re-assessment of dysphagia should be based on the recommendation of swallowing experts and customized on the individual case
- Longitudinal studies on the evolution of swallowing function are required to guide the definition of general recommendation on the timing of swallowing re-assessment

Case Study: Huntington's Disease

- Two types of treatments may impact on swallowing function:
  - Pharmacological treatment for HD
  - Rehabilitative treatment for swallowing
- Swallowing therapy by SLPs is based on two mechanisms:
  - Rehabilitation
  - Compensation

Case Study: Lewy Body Dementia

- Globally, 47 million people are affected by dementia, and out of them, 15–20% are estimated to have LBD
- A term encompassing both:
  - Dementia with Lewy bodies (DLB)
  - PD dementia (PDD)

Q9

Case Study: Lewy Body Dementia

- These neurodegenerative disorders share the same pathological hallmarks
  - With alpha-synuclein inclusions and neuronal loss
  - Complex clinical manifestations with cognitive dysfunction, motor disturbances, fluctuations, visual hallucinations and autonomic dysfunction
- There are no prevention or disease-modifying drugs, and consequently, treatment is directed toward symptom improvement

Case Study: Lewy Body Dementia

- COVID-19
- Silent aspiration is a risk factor for pneumonia and early death
- Swallowing dysfunction was confirmed in 83% of the LBD patients
- Tracheal penetration (27%), pharyngeal retention (~50%) & aspiration was present in LBD patients
- Patients did not have any subjective swallowing complaints

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Neurogenic Dysphagia & Return to Hospital Admission Rates

- Likely Presence of Cognitive Impairment
- Dysphagia
- Altered Mechanical Diet
- Reduced Activity
- Reduced Engagement
- Risk of Aspiration
- Recent Hospitalization
- NOW: Recent COVID-19 Infection

CONTINUED

AHCA & the Coronavirus Pandemic

- CDC Guidance for Steps Healthcare Facilities Can Take Now to Prepare for Coronavirus Disease 2019 (COVID-19)
  - www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/steps-toprepare.html
- The Florida Department of Health also provides significant resources including FAQs at:
  - http://www.floridahealth.gov/diseases-and-conditions/COVID19/index.html
  - Including what to do if you suspect a person may have COVID-19
- The Agency encourages you to visit the Department of Health's dedicated COVID-19 webpage at www.FloridaHealth.gov/COVID-19
- This remains the best and most up-to-date resource for information and guidance regarding COVID-19 in Florida
- For any other questions related to COVID-19 in Florida, please contact DOH's dedicated COVID-19 Call Center by calling 1-866-779-6121 or emailing COVID-19@flhealth.gov

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AHCA & the Coronavirus Pandemic

- CDC recommendations for infection prevention and control (IPC):
  - Assess patients with acute respiratory symptoms and risk factors for COVID-19 to minimize exposure
    - Including placing a facemask on the patient and isolating them
  - Use Standard/Contact/Airborne Precautions and eye protection
  - Perform hand hygiene
  - Practice how to properly don, use, and doff PPE
  - For diagnostic facilities - perform aerosol-generating procedures, including collection of diagnostic respiratory specimens, in an AIIR, while following appropriate IPC practices, including use of appropriate PPE

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Neurogenic Dysphagia & Return to Hospital Admission Rates

- Factors Affecting Return to Hospital Admission Rates:
  - Previous Hospital or SNF Admission
  - COVID 19
  - Neurogenic Condition
  - Cognitive Decline Dx
  - Speech/Language Impairment Dx
  - Altered Mechanical Diet
  - Use of Respirator/Ventilator, G/NG-Tube or Placement of Tracheostomy
  - Co-morbid Respiratory-related Dysphagia Dxs

Management of Dysphagia in Acquired & Progressive Neurological Conditions

- The components of clinical evaluation are similar for patients with acquired neurologic disease as for other patient populations
- Typically, this will include a cranial nerve exam, voluntary swallows, test trials of ice or water, and voluntary coughing
- Outcomes of these tests include integrity of the oral-motor mechanism, ability to swallow and cough volitionally, and/or throat clears, coughing, or change in vocal quality (to wet/gurgle) post swallow

Management of Dysphagia in Acquired & Progressive Neurologic Conditions

- The use of questionnaires or scales to evaluate dysphagia can be tricky in patients with acquired neurologic conditions
- This is because, in many of these diseases, there is the potential impact to the sensory system and/or sensory perception
- They may not self-report symptoms of disordered swallowing even when they exist
- The gold standard for evaluating swallowing in patients with acquired neurological diseases is the use of imaging

Management of Dysphagia in Acquired & Progressive Neurologic Conditions

- Changes to swallow function will vary according to disease but broadly may reflect:
  - Weakness
  - Spasticity
  - Rigidity
  - Hypo/hyperkinesia
  - Ataxia/discoordination

Management of Dysphagia in Acquired & Progressive Neurologic Conditions

- Diet changes are frequently recommended
- Must only be undertaken when indicated by clinical/instrumented evaluation
  - The consequences of nutrition, hydration, and quality of life are evaluated

Management of Dysphagia in Acquired & Progressive Neurologic Conditions

- Follow-up assessment is determined primarily by goal status for:
  - Patients with a grossly stable neurogenic dysphagia
  - Those who are expected to have a return to normal or near-normal function
- SLPs are often integral members of such multidisciplinary clinic teams and through such settings can monitor patient progress
  - OT/PT → I'm looking at YOU!

Management of Dysphagia in Acquired & Progressive Neurologic Conditions

- Speech, language, cognition, and swallowing share many neural substrates impacted by neurological disease
  - Share peripheral anatomic substrates as well
- This means that speech, language, and/or cognitive problems have a high likelihood of coexisting with dysphagia in patients with neurological disease

The Role of OT in Management of Feeding & Swallowing Disorders

- The role of OT in feeding and swallowing evaluation and treatment has a long-standing history
  - It has declined over the past two decades
- OT's training and domain of concern are an ideal fit for feeding and swallowing evaluation and treatment
  - This role has largely been taken over by other professionals such as SLPs and special education teachers

Q10

The Role of OT in Management of Feeding & Swallowing Disorders

- Adults experiencing dysphagia usually have a strong desire to regain normal or near-normal function
- OT should be an integral member of the multidisciplinary team
- With an extensive knowledge of human function, ADL retraining, and a holistic approach to personal care OTs are well qualified to assess and treat patients with feeding and swallowing dysfunction

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The Role of OT in Management of Feeding & Swallowing Disorders

- OTs have a considerable role to play in the treatment of feeding and swallowing dysfunction
- It is normal procedure in many areas of medicine and allied health services for new subspecialties to emerge in response to developing knowledge or skill
- OTs can continue to grow!

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The Influence of PT on Oropharyngeal Dysphagia in Acute Stroke Patients

- AIM. To evaluate the effect of a designed physical therapy program that consists of therapeutic physical exercises in addition to neuromuscular electrical stimulation on severe swallowing disorders (oropharyngeal dysphagia) in acute ischemic cerebrovascular stroke patients
- Methods. Thirty stroke patients suffering from severe dysphagia were assigned randomly to two equal groups: the study group (G1) and the control group (G2)
- The patients in the study group (G1) received medical treatment in addition to a designed physical therapy program mainly directed at strengthening and stimulating the elevator muscles of the larynx above and below the hyoid bone, whereas the patients in the control group (G2) were under medical treatment only.

The Influence of PT on Oropharyngeal Dysphagia in Acute Stroke Patients

- Digital fluoroscopy assessed: oral transit time, laryngeal elevation, hyoid elevation, esophageal sphincter opening, and aspiration or penetration. Assessment was carried out before and at the end of treatment after 6 weeks.
- Results. Before treatment, there were no significant differences in different variables between G1 and G2. After treatment there was significant improvement in all variables in G1 compared with G2, as measured by digital fluoroscopy.
- Conclusion. The suggested physical therapy program could be an effective and safe method for improving and restoring the normal swallowing mechanism in ischemic stroke patients suffering from severe dysphagia.

Dysphagia & Acupuncture in Post-Stroke Patients

- Does the Addition of Specific Acupuncture to Standard Swallowing Training Improve Outcomes in Patients with Dysphagia After Stroke?
- 120 patients
  - 60 acupuncture and 60 control patients
- Tools to Assess Dysphagia
  - Standardized Swallowing Assessment
  - Dysphagia Outcome Severity Scale
  - Modified Barthel Index
  - Swallowing-Related Quality of Life
- Improved after 4 weeks of Specific Acupuncture

Clinical Rehabilitation 2016, Vol. 30(3)

Dysphagia & Acupuncture in Post-Stroke Patients

- Acupuncture & Swallowing Training
- Affected the peripheral muscles and muscles of the swallow

Neurogenic Dysphagia in Older Adults with Motor Disorders: Part 1

- www.jwphdllc.com
- jwphd@jwphdllc.com
- Summary, Q & A

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