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Polypharmacy & the SLP during the COVID-19 Pandemic: Part 2

Jeanna Winchester, PhD

Moderated by:

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Polypharmacy & the SLP during the COVID-19 Pandemic: Part 2

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- **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.
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Bio

- Jeanna Winchester PhD is a clinical cognitive neuroscientist who specializes in neurodegeneration and aging. She is a professor, a published author and a scientist.



Learning Outcomes

After this course, participants will be able to:

- Describe the relationship between COVID-19 and the neurological system of dysphagia.
- List factors contributing to polypharmacy in skilled nursing facility residents during the pandemic.
- Describe the long-term effects of polypharmacy and mechanical ventilation in individuals recovering from COVID-19.



Bodily Systems Affected By Dysphagia

- 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



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



Respiration & Dysphagia

- Anatomy & Physiology of the Speech and Hearing Mechanisms
 - Is altered by aging, nutritional status, electrolyte balance & infections
- Primary & Secondary Muscles of Respiratory
- Direct Impact on the Cognitive, Neurological, Muscular & Gastrointestinal Systems of Dysphagia



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



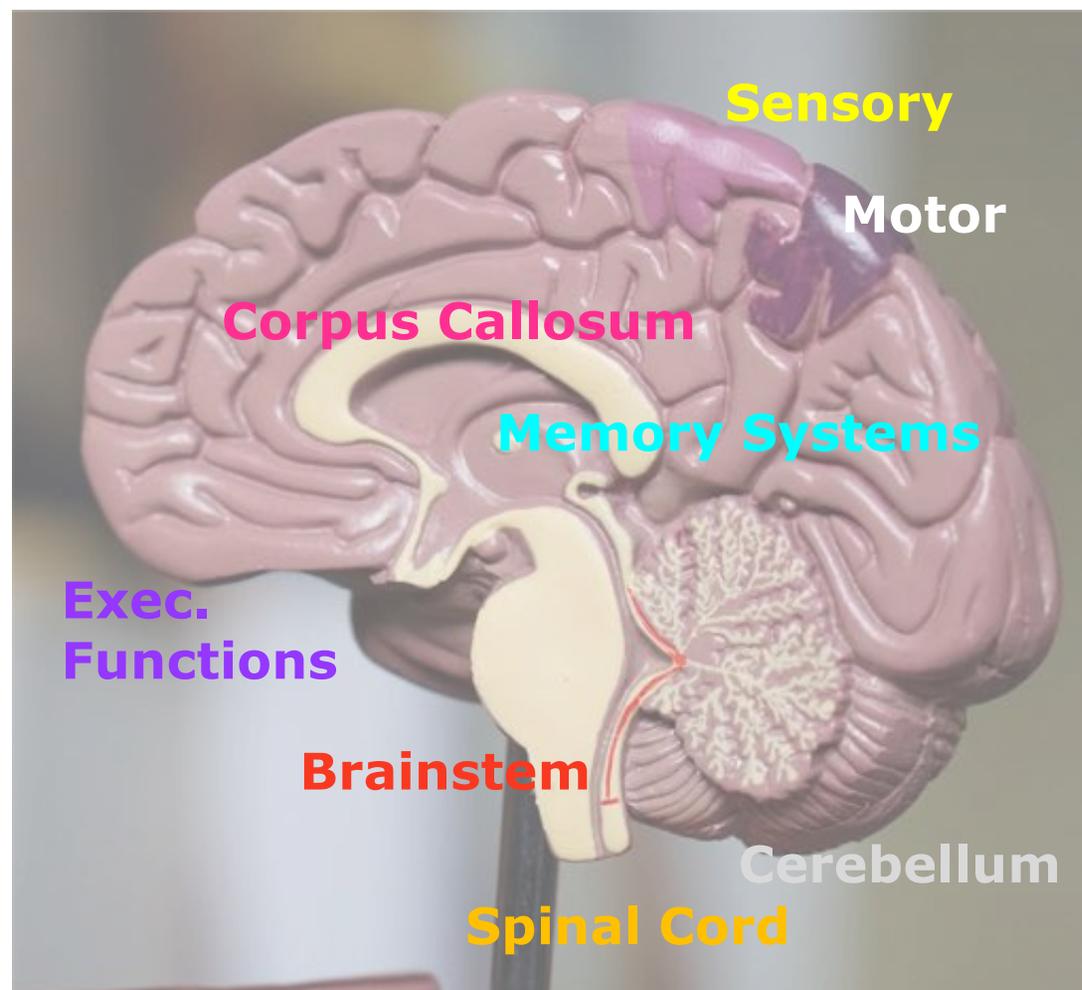
Respiration & Polypharmacy

- Nearly 1 in 25 older adults taking multiple medications are likely to experience adverse drug-drug interactions
- The prevalence of polypharmacy is highest among the oldest old
- Most common polypharmacy associated with cardiovascular or cardio/pulmonary diagnoses



Neurogenic Dysphagia

- Coordinating functioning of this system and overall perceptual awareness is central to safe deglutition
- An additional course available to learn more about Neurogenic Dysphagia!



The Oral Mechanism(s) Exam

- Five Cranial Nerves have been shown to be essential to the swallowing mechanism
- Trigeminal Nerve (CN V)
 - Roles in mastication, oral and pharyngeal phases
- Facial Nerve (CN VII)
 - Obvious facial role but also, saliva production



The Oral Mechanism(s) Exam

- Glossopharyngeal Nerve (CN IX)
 - Taste, general sensation, elevation of the soft palate and the gag reflex
- Vagus Nerve (CN X)
 - Everything below the hyoid bone, including the cough reflex
 - Sensory, Motor and Visceral Innervations



COVID-19 & the Neurological System of Dysphagia

- A study from the Lancet
 - A meta-analysis from several studies between February and late-April
- Of the more than 2K patients evaluated, 153 cases were identified with unique COVID-19 specific neurological conditions
- These kinds of studies are limited by distance, a lack of broader emphasis and clinical specialty



COVID-19 & the Neurological System of Dysphagia

- Broad clinical syndromes associated with COVID-19 were classified as a cerebrovascular event:
 - Defined as an acute ischemic, hemorrhagic, or thrombotic vascular event involving the brain parenchyma or subarachnoid space
- Altered mental status
 - Defined as an acute alteration in personality, behavior, cognition, or consciousness



COVID-19 & the Neurological System of Dysphagia

- 16 peripheral neurology factors
 - Defined as involving nerve roots, peripheral nerves, neuromuscular junction, or muscle
- Or other
 - With free text boxes for those not meeting these syndromic presentations



COVID-19 & the Neurological System of Dysphagia

- Cerebrovascular events in patients with COVID-19, which have been well documented, were a large group within this study's patient population
- Identified a large proportion of cases of acute alteration in mental status, comprising neurological syndromic diagnoses:
 - Encephalopathy and encephalitis
 - Primary psychiatric syndromic diagnoses, such as psychosis



COVID-19 & the Neurological System of Dysphagia

- Although cerebrovascular events and altered mental status were identified across all age groups, this study confirms that cerebrovascular events predominate in older patients
- However, this data identifies that acute alterations in mental status were disproportionately over-represented in younger patients



COVID-19 & the Neurological System of Dysphagia

- NOTE: the rates of neurological and psychiatric complications of COVID-19 cannot be extrapolated to mildly affected patients or patients with (presumably) asymptomatic infection, especially those in the community, but give a broad national perspective on complications severe enough to require hospitalization
 - Reminder, this study was conducted in Great Britain!
- The rates in American and predominance among American elderly is likely much higher



COVID-19 & the Neurological System of Dysphagia

- Observed a disproportionate number of neuropsychiatric presentations in younger patients and a predominance of cerebrovascular complications in older patients
 - Which might reflect the state of health of the cerebral vasculature and associated risk factors, exacerbated by critical illness in older patients



COVID-19 & the Neurological System of Dysphagia

- The large number of patients with altered mental status might reflect increased access to neuropsychiatry or psychiatry review for younger patients, and increased attribution of altered mental status to delirium in older patients
 - Meaning, clinicians may attribute the change to dementia or delirium in older patients because they are “older” and attribute it to neuropsychiatric dysfunction because the patients are “younger”
 - Implicit bias by the physicians to say that younger adults were having neuropsychiatric disorders while older adults were having cognitive disorders?



COVID-19 & the Neurological System of Dysphagia

- Additional evidence:
 - This novel coronavirus primarily causes respiratory, cardiovascular and pulmonary destruction
 - With clinical manifestations largely resembling those of other SARS viruses
 - However, neurological symptoms including headache, anosmia, ageusia, confusion, seizure, and encephalopathy have also been frequently reported in COVID-19 patients
 - Anosmia = loss of smell
 - Ageusia = loss of taste



COVID-19 & the Neurological System of Dysphagia

- Additional evidence:
 - In a study of 214 hospitalized COVID-19 patients in Wuhan, China, neurologic findings were reported in 36.4% of patients
 - Neurological symptoms were more commonly observed in patients with severe infections (45.5%)
 - Similarly, a study from France reported neurologic findings in 84.5% (49/58) of COVID-19 patients admitted to hospital



COVID-19 & the Neurological System of Dysphagia

- Additional evidence:
 - Importantly, a recent study in Germany demonstrated that SARS-CoV-2 RNA could be detected in brain biopsies in 36.4% (8/22) of fatal COVID-19 cases
 - Which highlights the potential for viral infections in the human brain
- A recent study used neuro progenitor cells to study the direct links between SARS-CoV-2 & neurological issues



COVID-19 & the Neurological System of Dysphagia

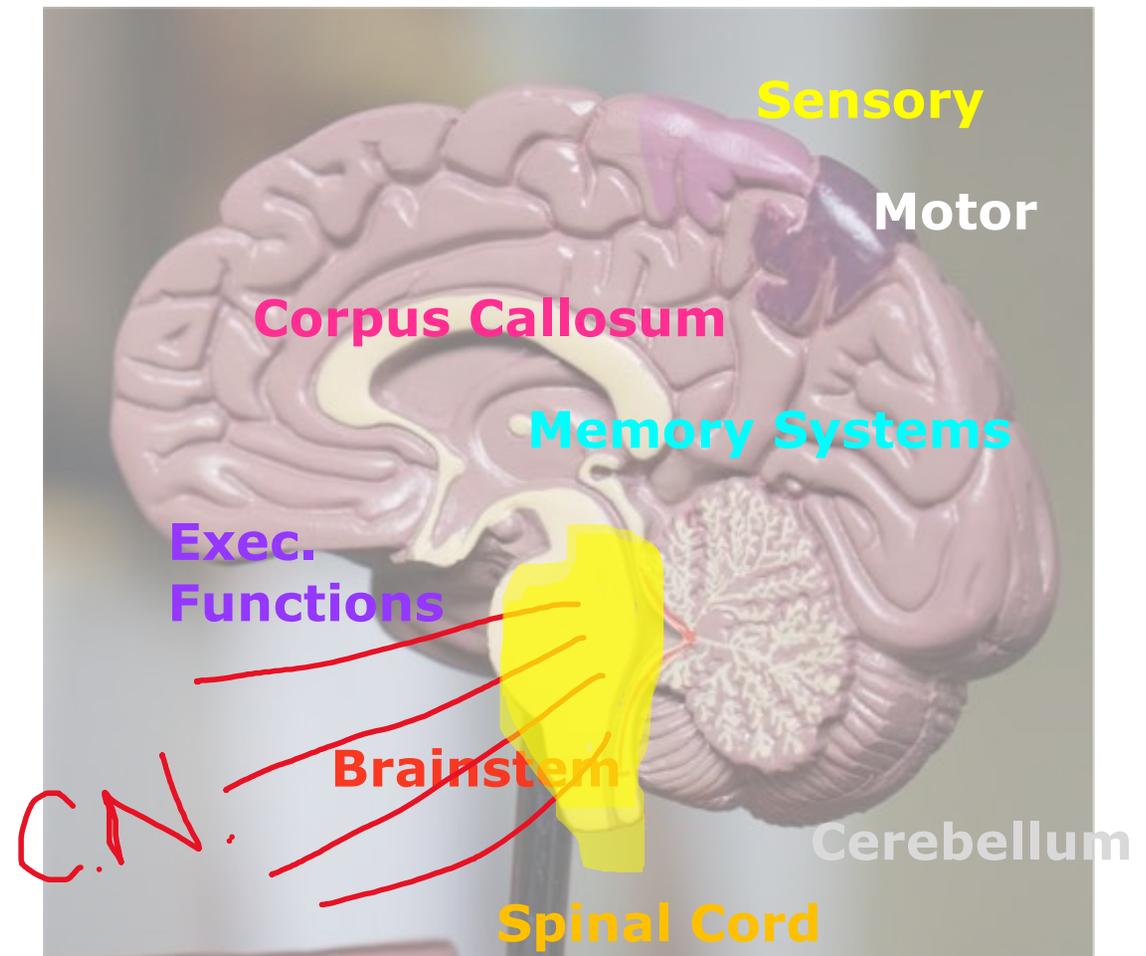
- The nervous system has certain areas where it produces its own type of stem cells
- These can grow into other types of neuronal tissue
- This study demonstrated possible direct links between the Sars-CoV-2 virus, its ability to replicate in neurological tissue and the possible direct links to neurological and neuropsychiatric dysfunction in patients



Reviewing Neuro Anatomy

- COVID-19 related neurological damage often seen in the brainstem and inferior area of the thalamic region
 - CNs & Brainstem!

- Begins in the lungs and enters the CNS



The Oral Mechanism(s) Exam

- Let's take another look at these cranial nerves!
 - Trigeminal Nerve (CN V)
 - Roles in mastication, oral and pharyngeal phases
 - Facial Nerve (CN VII)
 - Obvious facial role but also, saliva production
 - Glossopharyngeal Nerve (CN IX)
 - Taste, general sensation, elevation of the soft palate and the gag reflex
 - Vagus Nerve (CN X)
 - Everything below the hyoid bone, including the cough reflex
 - Sensory, Motor and Visceral Innervations
- **Effects of COVID-19?**



COVID-19 & Delirium

- Likely altered cognitive status while infected if over the age of 60yrs and COVID-19+
- How does this affect consent/care?
- Likely need to assess Memory, Attention, Lexical Recall as well as Thematic Comprehension/Recall Neuromotor Functions, Taste, Smell, Executive Functions & Dysphagia



COVID-19 & Delirium

- It's a "USE IT OR LOST IT" situation!
- By assessing these early in a patient's treatment and facilitating maintenance of these functions while the patient recovers from the COVID-19 infection
 - More likely to have positive patient outcomes
 - Though → this may not alter the destruction of other systems, that remains unknown
 - More likely to improve the patient's quality of life as they are going through this difficult time



COVID-19 & the Neurological System of Dysphagia

- Clear roles for Speech Evaluations and Therapy
- Clear need for Physical and Respiratory Evaluations and Therapy
- Upon discharge, likely need Occupational Evaluations and Therapy as this patient transitions back to their “home life” during this difficult time



Polypharmacy & the Skilled Nursing Setting

- Multimorbidity can have an impact on disease management burden, increased levels of care complexity, and increased risk of experiencing fragmented care
- In addition, multimorbidity was found to be associated with decline in functional status and subsequent frailty



Polypharmacy & the Skilled Nursing Setting

- While the presence of multimorbidity may predict Return to Hospital Admissions (RHAs), perhaps it is also an indicator of wider issues
 - Such as complexity, instability of disease management, fragmented care, and disease burden
- In previous studies, appropriate discharge support was shown to reduce RHAs
 - The intervention components included in these studies vary, making it difficult to assess the effectiveness of individual components



Polypharmacy & the Skilled Nursing Setting

- For example
 - Post-discharge follow-up at home?
 - Having rehab services in place that makes a difference?
- Also possible that those selected for supported discharge have been identified by extreme events and exacerbations, which might return to normal without active intervention



Polypharmacy & the Skilled Nursing Setting

- Medicine-related risks were not found to be strongly associated with future RHAs in the multivariable logistic regression
 - A more complicated/advanced statistical analysis!
- Though previous studies have found that polypharmacy, high risk medication, and diuretic use were associated with RHAs



Polypharmacy & the Skilled Nursing Setting

- Those studies did not take account of number of comorbidities, supported discharge and deprivation index in their multivariate logistic regressions
- Here, the number of comorbidities in this context may be driving RHAs, due to its complexity, instability, and management burden



Polypharmacy & the Skilled Nursing Setting

- Taking this fundamental information and then incorporating it with the number of elderly residents that were affected by COVID-19, RHAs + multimorbidity + polypharmacy could instigate a new wave of skilled nursing admission rates and chronically ill patients
- What effect could this have on LTC?
 - Previous 10yrs saw a shift towards Home Health and away from Skilled Nursing care
 - Will the reverse happen now in the 2020s?



Polypharmacy & Mechanical Ventilation

- Meta-analyses have also evaluated the role of mechanical ventilation in patients who did and did not survive COVID-19
 - Some of these studies grouped patients based on age
 - Some of these studies grouped patients based on survival rate
 - A few studies grouped patients based on how long they were in the hospital



Polypharmacy & Mechanical Ventilation

- In general, studies showed that between December 2019 & June 2020 that individuals with severe/critical COVID-19 that were >50yrs had a 40-75% likelihood of requiring Invasive Mechanical Ventilation (IMV)
 - As opposed to a nasal cannula or oxygen delivered via a mask, AKA Non-invasive Mechanical Ventilation (NIMV)
- These meta-analyses reviewed studies from across the globe
 - Many different types of patient populations!



Polypharmacy & Mechanical Ventilation

- Across all cases of COVID-19 that were hospitalized, those patients that were less likely to survive COVID-19 had a 50-75% greater likelihood for requiring IMV
- Overall, hypertension, diabetes and cardiovascular disease were the most likely comorbidities
 - Populations likely to have polypharmacy to begin with!



Polypharmacy & Mechanical Ventilation

- Patients on IMV or NMV, even in the absence of COVID-19, are more likely to have multimorbidity and polypharmacy
- Previously discussed polypharmacy risk in COPD
 - Extrapolate possible polypharmacy risk in COVID-19
 - Add on top of that the use of mechanical ventilation
 - Dries out the oral/pharyngeal and nasal cavities
 - Possible other concomitant oral/pharyngeal infections



Mechanical Ventilation & COVID-19

- What does mechanical ventilation due to the respiratory and neurological systems of dysphagia in aging patients who have survived COVID19?
- What is the role of the interdisciplinary care team in LTC to serve this population in the next 5-10yrs?
- How will this impact healthcare for the next decade?



Summary/Q&A

- There exists a definitive relationship between the neurological effects of COVID-19 and dysphagia
- There exists a definitive relationship between the neurological dysphagia and polypharmacy
- There exists a definitive relationship among elderly patients with neurological dysphagia, polypharmacy and survivors of COVID-19



Summary/Q&A

- As a clinical community, it is upon us to imagine the long-term effects that we can expect in the coming years due to the pervasive impact this virus has had on the elderly community
- It is also upon us to reimagine the role of speech, physical, occupational and respiratory therapy
 - Additionally, how will this impact the American trend towards home healthcare and away from skilled care?
 - Will there be a reversal of some sort?



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