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Polypharmacy & the SLP during the COVID-19 Pandemic: Part 1

Jeanna Winchester, PhD

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

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Polypharmacy & the SLP during the COVID-19 Pandemic: Part 1

Jeanna Winchester PhD

Clinical Scientist, Professor of Medicine, Allied-Health & CEU Instructor, Published Author

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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.

- **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:

- Describe the risks of polypharmacy in the long-term care setting.
- List factors contributing to polypharmacy across the respiratory system of dysphagia.
- Identify components of the oral mechanism examination that may be affected by polypharmacy and COVID-19.

Essential Concepts & Terms

- Substances applied for therapeutic purposes fall into one of the following three general categories:
  - Drugs or medications
    - A chemical agent capable of producing biologic responses within the body
    - Desirable (therapeutic) or undesirable (adverse)
    - After a drug is administered it is called a medication

Essential Concepts & Terms

- Substances applied for therapeutic purposes fall into one of the following three general categories:
  - Biologics
    - Agents naturally produced in animal cells, by microorganisms, or by the body, itself
      - Hormones, monoclonal antibodies, natural blood products and components, interferons and vaccines

Essential Concepts & Terms

- Substances applied for therapeutic purposes fall into one of the following three general categories:
  - Complementary and alternative medicine therapies
    - This involves natural plant extracts, herbs, vitamins, minerals, dietary supplements, and additional techniques outside of the realm of conventional therapies
      - Such as PT/SLP/OT Rehabilitation
      - Physical manipulation
      - Massages
      - Acupuncture
      - Hypnosis
      - Biofeedback
      - ETC.

Essential Concepts & Terms

- There are chemical, generic and trade names for drugs
  - It can make it confusing to know what is what!
- Combination drugs contain more than one active generic ingredient
- Goal is to minimize adverse events
  - This is where you can be vital!

Essential Concepts & Terms

- Side effects are confused with adverse effects
  - Side effects involve a non-therapeutic reaction to a drug
    - May be transient
    - Often considered tolerable but immediate intervention is required
    - If you see something in your patient, say something!

- Can be administered:
  - Oral, Sublingual, Buccal, Parenteral, NG-tube/Enteral, Transdermal, Ophthalmic, Optical, Nasal, Vaginal and Rectal

Polypharmacy Fundamentals

- The main point here is to prevent a medical error

- Medication errors occur when any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer
  - This dual responsibility provides a simple, though useful, way to conceptualize medication errors as resulting from a healthcare provider's error or patient error
    - i.e. the patient didn't adhere to the prescribed regimen

Polypharmacy Fundamentals

- Medication errors are the most common cause of morbidity and preventable death within healthcare
- Many geriatric patients have multiple chronic disorders, each of which may be treated by individual specialists
- Patients may receive multiple prescriptions, sometimes for the same condition, that can have conflicting actions (this is polypharmacy)

Polypharmacy Fundamentals

- Polypharmacy dramatically increases the risk of drug interactions and side effects
- Significant variability exists between patients, so just because a medication “works,” doesn’t mean it works the same, in every way, all the time, in every single person
- Respect the patient while facilitating a reduction in the risk of adverse effects of polypharmacy

Polypharmacy & Medicare Pts

- 27,765 Medicare Beneficiaries were sampled in 2019

- Individuals most likely to have a medication-related event were:
  - Predominantly female (59%), have a depression diagnosis, Congestive Heart Failure (CHF), diabetes mellitus, End-Stage Renal Disease (ESRD), respiratory diagnoses and hypertension

Polypharmacy & the SLP's Role

- Polypharmacy has significant effects across the Cognitive and Speech/Language Domains

- Tips for medication reconciliation during SLP therapy visits
  - Emphasizing cognitive comprehension
  - Can utilize this as a reading/writing or other Speech-Language deficit therapeutic tool and/or assessment
  - Ensures that the patient is receiving individualized care while also evaluating or treating Speech-Language Pathological issues

Polypharmacy & the Rehab Team

- Age-related decline in lean body mass and total body water leads to an increased concentration of water-soluble drugs in the body, because the drug is distributed across a "smaller body of water"

- Changes to the liver result in more levels of free drug available in the bloodstream

Polypharmacy & the Rehab Team

- The aging cardiovascular system has decreased cardiac output and less efficient blood circulation, which slows a drug's distribution
  - May need a smaller dose over a longer period of time that may be slowly increased to the amount that is safe and effective
- Alterations in kidney function can result in increased amounts of time before drugs are eliminated from the body
  - Toxic accumulation is the most common adverse event

Polypharmacy & Sarcopenia

- Sarcopenia or low lean mass can be found in nearly 10% of people aged 60—70yrs and this amount increases sharply with age

- Many drugs affect/interfere with various metabolic processes and circulatory homeostasis
  - Cardiovascular and energy dysfunction
  - Diminished blood flow
  - Electrolyte, hormonal and acid-base balance changes can occur

Polypharmacy & the Rehab Team

- Polypharmacy can affect the capacity for a patient to complete Activities of Daily Living (ADLs) or alter their ability to navigate their home environment

- Signs of Polypharmacy:
  - Altered cognitive status or speech/language skills
  - Altered physical state (too much or too little)
  - Altered interactions with others
    - Depression is most likely comorbidity to polypharmacy
      - ~11% of all individuals over the age of 71yrs
      - Affected by other chronic conditions (makes it worse)

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

Respiration & Polypharmacy

- Research has shown that >60% of patients had 3+ comorbidities requiring medication use
  - Nearly ¼ had 5+ comorbidities requiring medication use
  - However, when those cases were reviewed later, nearly HALF of the medications they were taking, regardless of the number of comorbidities they had, could be discontinued
    - Meaning they didn't need them anymore!

- By speaking to the nursing team or their physicians, you may help them get back on track!

Respiration & Polypharmacy

- Importantly, when these medications were discontinued, only 2% of individuals needed to take one of those medications again, later
- No adverse events or deaths were attributed to the discontinuation of the medication
- Upwards of 88% of those patients who discontinued those medications reported increased Quality of Life, which is our goal!

Dysphagia & Polypharmacy

- One symptom of polypharmacy among aging Americans is Xerostomia (reduced saliva output)
  - Recent evidence suggests anywhere from 13-37% among adults aged 60-90yrs

- Also observed in nearly half of patients taking antihypertensives, analgesics, statins, anticholinergics, psychiatrics, antibiotics and Proton pump inhibitors (PPIs)

Dysphagia & Polypharmacy

- Issues related to Xerostomia (dry mouth) have been associated with:
  - Speech, mastication, dysphagia, changes in taste, dental caries, impaired use of prostheses, recurrent infections, halitosis, deterioration of soft tissues and compromised Quality of Life
- Artificial and substitutes for saliva are available but provide only modest relief and can require multiple applications throughout the day
  - Humidifiers can be a healthful addition at night

Case Study: Polypharmacy & COPD

- Patients suffering from significant respiratory syndromes or distress are at a high risk of polypharmacy

- In the next slides, we will look at just some of the medications that a patient with Chronic Obstructive Pulmonary Disease (COPD) may be taking
  - These patients are likely taking between 5 and 12 medications at any one point in time
  - Often associated with Medication-related Problems (MRPs)

Case Study: Polypharmacy & COPD

- Bronchodilators reduce bronchoconstriction through a relaxing of the smooth muscle fibers in the tissues of the lungs
  - Beta-2-adrenergic agonists, Anticholinergic agents
- Mucolytics, expectorants, antitussives and xanthine inhibitors are used to decrease congestion due to an increased sputum amount
- Antibiotics

Case Study: Polypharmacy & COPD

- Mucolytics and expectorants act on mucus to break down the secretions so they can be eliminated

- Short-acting Beta 2 agonists treat Asthma & COPD

- Long-lasting Beta 2 agonists are a delayed onset bronchodilator utilized for continuous bronchodilation that can prevent acute shortness of breath

Case Study: Polypharmacy & COPD

- Short acting anticholinergics are used to treat COPD, Emphysema, Chronic Bronchitis and provides symptomatic relief of rhinorrhea

- Long-term anticholinergics serve as a delayed onset anticholinergic is utilized for continuous bronchodilation and shortness of breath

- Corticosteroids are used to reduce inflammation and improve gas exchange

Case Study: Polypharmacy & COPD

- Leukotriene inhibitors are used to reduce the airway inflammation and are useful in long-term control of asthma
- Xanthine derivatives are used to treat other respiratory difficulties
- Decongestants stimulate the sympathetic nervous system to reduce respiratory tract swelling

Case Study: Polypharmacy & COPD

- Vasoconstrictors may be applied to the nasal nucleus membranes and may have an immediate effect on nasal congestion
- Antihistamines are typically used for allergies
- Antitussives inhibit or suppress coughing and are usually used to treat a non-productive, dry cough

Imagine what else this patient may be taking!

COVID-19 Affects the Systems of Dysphagia

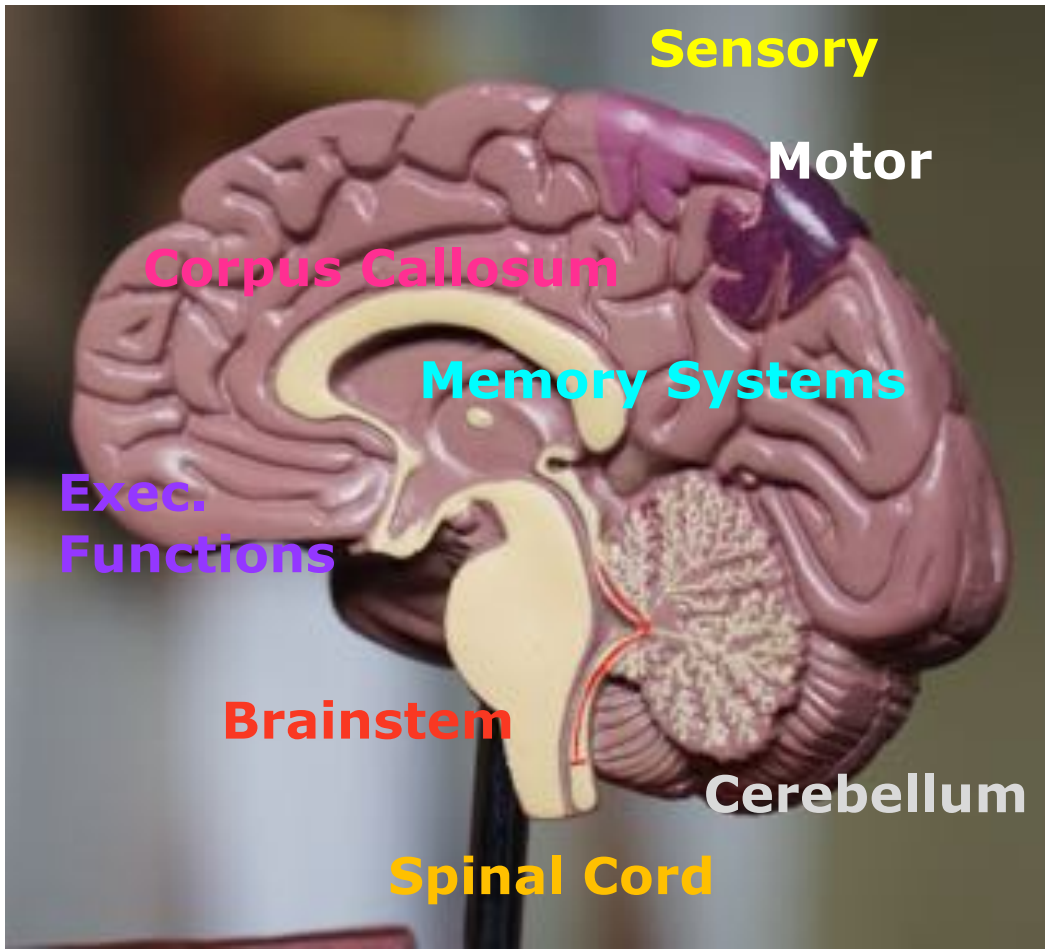
- In a recent study of 220 hospitalized and 311 non-hospitalized patients in Atlanta, GA with laboratory-confirmed COVID-19, the following characteristics were associated with hospitalization:
  - >65yrs of age, black race, having diabetes mellitus, lack of insurance, the male sex, a history of smoking and obesity
  - Also more likely to have hypertension and CKD
- Infections can lead to severe outcomes, including death

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.

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

The Oral Mechanism(s) Exam

- Hypoglossal Nerve (CN XII)
  - All intrinsic tongue muscle movements
  - Preparation of the bolus for transit to the pharynx

- A branch of the CN XII called the ansa cervicalis
  - From segments C1 to C3
  - Facilitates movement of the hyoid muscles & neck muscles and stabilizes the neck

- CNs V, IX & XII most associated with dysphagia

COVID-19 Affects the Respiratory System of Dysphagia

- Oral, Pharyngeal, Laryngeal, Tracheal, Bronchial
- Lobar
- Long-term Consequences (e.g. tissue scarring)
- All the CNs described previously can be negatively affected by Polypharmacy & a COVID-19+ diagnosis

COVID-19 & the Respiratory System of Dysphagia

- Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) is the virus that causes COVID-19
- Infects host through the Angiotensin-converting enzyme 2 (ACE2) on the respiratory epithelium
- Part of the Renin-angiotensin-aldosterone system (RAAS) and its neurohormonal pathways

COVID-19 & the Respiratory System of Dysphagia

- Treatment with ACE inhibitors or angiotensin-receptor blockers (ARBs) might increase risk of COVID-19 after exposure to SARS-Cov-2
  - Conducted a major study in order to find out!

- 12,500 patients in New York were evaluated
  - 5894 pts tested COVID-19+ (46.8%)
  - 1002 pf those patients exhibited severe illness

COVID-19 & the Respiratory System of Dysphagia

- Did not find an association with ACE inhibitors or ARBs

- Modest significance/trends showed that patients taking beta-blockers
  - Had a marginal increased risk of COVID-19, but not serious illness associated with COVID-19

Aspiration Risk with COVID-19

- Thrush or other microbiomes in oral, pharyngeal, laryngeal or upper respiratory pathways
- Reduced chest wall capacity
- Reduced or absent Cough Reflex
- Oropharyngeal & laryngeal sensitivity & motor response

Aspiration Risk with COVID-19

- 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 or use of mechanical ventilation (can dry the respiratory tract)
- Superinfections (e.g. MRSA, Cdiff, SIBO, etc.)

Summary/Q&A

- There are widespread effects of polypharmacy across the bodily systems involved in the swallow
- COVID-19 can exacerbate many of the bodily systems affected by polypharmacy, resulting in new or worsening dysphagia
- The SLP, PT & OT can be vital to alerting the nursing and/or physician teams to the possible signs and symptoms of polypharmacy

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