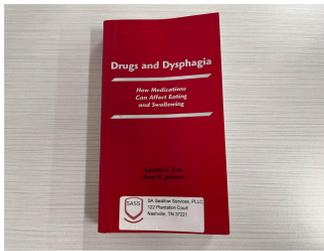


Medications and Dysphagia

Considerations for SLPs

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Carl, L. L., & Johnson, P. R. (2006). *Drugs and dysphagia: How medications can affect eating and swallowing*. Pro-Ed.

75% of adults aged 60+ have more than one diagnosed chronic medical condition.

69% of adults aged 40+ have taken at least one prescription medication in the last 30 days.

22% of adults aged 40+ have taken 5 or more prescription medications in the last 30 days.

Hales 2019

Appetite		Myopathy
Xerostomia		Dystonia
Alertness	<p>At least 160 medications in the <i>Physician's Desk Reference</i> list dysphagia as an adverse drug reaction.</p>	Dyskinesia
GI motility		Ataxia
Motor function		Stomatitis
Taste/smell		GERD
Sensation		Esophageal injury

PDR.net

Adverse drug reactions (ADRs)

"A response to a drug which is noxious and unintended and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease or for the modification of physiologic function."

Harm that is directly caused by the drug at normal doses during normal use.

Side Effects?

This term tends to normalize/minimize adverse drug reactions and the FDA has recommended avoiding its use.



World Health Org 1972
Nebecker et al 2004

Types of adverse drug reactions

Adverse Drug Reaction Type A - "Side effects"	Adverse Drug Reaction Type B - Drug Allergies
Predictable and common	Unpredictable and dose independent
Dependent on dose	An adverse drug reaction mediated by an immune response (e.g., rash, hives).
Account for 80% of ADRs	Account for 20% of ADRs

Thong & Tan 2011

Adverse Drug Events (ADEs)

"An injury resulting from the use of a drug"

- Overdose
- Sudden dose change or discontinuation of a drug
- Drug interactions or drug/food interactions
- Medication errors: "mishaps that occur during prescribing, transcribing, dispensing, administering, adherence, or monitoring a drug"

Common culprits:

- Blood thinners (Warfarin)
- Insulin
- Seizure medications
- Opioids

CDC.gov

3-6%

Of all hospital admissions worldwide are caused by severe adverse drug reactions or adverse drug events

1.5 million

Estimated hospitalizations in the US each year due to adverse drug reactions/events

Torres-Jaen 2021

Risk factors for adverse drug reactions

- Patient age (65+)
- Renal failure
- Liver dysfunction
- Number of medications (polypharmacy)
- Higher dosage

Anticholinergics are everywhere

Up to 1/3 of all older adults take at least one anticholinergic-acting medication.

In a sample of 50 recent FEES completed by SA Swallowing Services (2022 and 2023), here are the most common anticholinergic drugs prescribed to our patients (SNF, LTACH, and IPR):

- Oxycodone - 22%
- Famotidine (Pepcid) - 20%
- Metoprolol (Lopressor) - 20%
- Trazodone - 14%
- Lorazepam (Ativan) - 12%
- Quetiapine (Seroquel) - 10%
- Furosemide (Lasix) - 10%
- Hydralazine (Apressoline) - 8%
- Olanzapine (Zyprexa) - 6%
- Fluoxetine (Prozac) - 6%



www.doa.gov

Medications affecting the Central Nervous System

These can cause dysphagia by:

- Decreasing level of arousal (causing inattention to eating)
- Direct suppression of brainstem swallowing function
- Inducing movement disorders
- Inducing neuromuscular blockade
- Inducing myopathy
- Impairing oropharyngeal sensation
- Disturbance of salivation



NIH.gov 2021

Medications affecting motor function

Neurotransmitters that particularly affect motor function:

- Dopamine
- Gamma Amino Butyric Acid (GABA)
- Serotonin

May impact the anticipatory phase, oral preparatory phase, oral phase, and initiation of the pharyngeal swallow

Drug classes which may most significantly impact motor function:

- Anticonvulsants
- Antipsychotics
- Antianxiety agents

Medications associated with weight loss

Reduced appetite:

- Selective Serotonin Reuptake Inhibitors (SSRIs) e.g. Zoloft, Prozac
- Stimulants e.g. Ritalin, Adderall
- Decongestants (phenylpropanolamine - no longer approved by FDA)
- Narcotic analgesics (e.g. morphine, codeine)

Changes in taste and smell:

- Anticholinergic drugs may cause dry mouth, altering or reducing taste
- Many drugs may alter or impair taste, including antidepressants, antibiotics, anticonvulsants, antihypertensives, anti-anxiety medications, antispasmodics, anti-inflammatory medications, hormonal agents, chemotherapy drugs.

Medications affecting secretions



National Library of Medicine 12/3/22

Medications that inhibit the neurotransmitter acetylcholine can result in **xerostomia**.

Many drugs have potential anticholinergic effects: 80% of the most commonly prescribed medications can cause dry mouth as a side effect.

Common medication classes causing xerostomia:

- antihistamines
- antidepressants
- anti-parkinson agents
- antipsychotics

Stomatitis

Inflammation and ulceration of the oral mucosa; damage to the salivary glands due to tissue hypoxia from decreased blood flow.

This can range from asymptomatic erythema to large, painful lesions in the mouth, pharynx, and/or esophagus.

Drugs which may cause stomatitis:

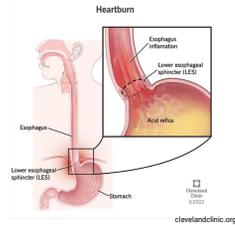
- Chemotherapy drugs (Incidence = 40%; with concomitant radiation, up to 100%)
- Anticonvulsants (e.g. Dilantin, Lamictal)
- Certain antibiotics ("cycline" drugs, e.g. Doxycycline, Minocycline)
- Immunosuppressants (such as Methotrexate) may predispose patients to viral/fungal infections

Medications that induce GERD

Medications can decrease the resting tone of the lower esophageal sphincter, resulting in increased regurgitation and reflux of gastric contents.

This is a very common possible ADR across a multitude of medications.

- Any anticholinergic agent
- Antidepressants
- Barbiturates
- Antihistamines
- Antipsychotic drugs
- Benzodiazepines
- Beta blockers
- Narcotics
- Muscle relaxants



Medication-induced esophageal injury

Caused by tablets/capsules that become lodged within the esophagus

Typically begins 4-12 hours following ingestion

Characterized by sudden onset of dysphagia symptoms including globus sensation and often severe chest pain

Common culprits: Aspirin and NSAIDs, acidic drugs, anticoagulants, anti-infective agents

Risk factors:

1. Medications with prolonged dissolution time
2. Large pills
3. Patients with GERD or other pre-existing esophageal disorders
4. Taking meds with little or no fluid
5. Laying down immediately after taking meds



Waywardbus.wordpress.com 4/23/23

Mental Status Changes

Sedation is associated with multiple classes of medications including antipsychotics, antidepressants, opiates, benzodiazepines, anticonvulsants

- Impairment of mental or physical abilities
- Decreased appetite and attention to eating
- Drowsiness - usually resolves after 1-2 weeks of use unless dosage is inappropriate.
- Decreased coordination



NIH.gov accessed 6/3/23

Nausea/Vomiting

- Medication-related nausea is one of the most commonly reported ADRs; emesis is less common but still reported.
- Rates up to 70% with certain drugs such as chemotherapeutics, but rates of 20-30% are common for many drugs across majority of drug classes.
- MRNV (medication-related nausea or vomiting) rates approach 100% in patients with significant polypharmacy.
- Usually most severe when patient is first taking a medication.
- Medications should usually be taken with food as a prevention for MRNV unless this is contraindicated.

Maceira 2012

Constipation

Very common anticholinergic side effect
Prevalence in patients taking opioids is 40-60%

Also might see commonly with:

- Iron supplements
- NSAIDs
- Antihistamines
- Blood pressure medications
- Chronic Zofran use

Another common mnemonic device for anticholinergic drugs:

*Can't see
Can't spit
Can't pee
Can't*

Sizar 2022
Rodriguez-Bernaldo 2021

Antipsychotic medications

Work by blocking dopamine in the basal ganglia, hypothalamus, limbic system, and brain stem.

These are a unique class of drugs which may commonly cause dysphagia as a side effect.

The FDA lists **66** possible ADRs associated with antipsychotic meds

Two categories:

Typical (first generation) antipsychotics

Atypical (second generation) antipsychotics

First generation drugs block dopamine and the second generation drugs block dopamine and also affect serotonin levels.

Evidence suggests that some of the second generation drugs have milder movement-related side-effects than the first generation drugs.

Be on the lookout for more significant adverse drug reactions in patients taking typical/first generation antipsychotics.

fda.gov

Typical/First Generation antipsychotic drugs:	Atypical/Second Generation antipsychotic drugs:
Chlorpromazine (Thorazine)	Clozapine (Clozaril)
Mesoridazine (Serentil)	Olanzapine (Zyprexa)
Thioridazine (Mellaril)	Quetiapine (Seroquel)
Fluphenazine (Prolixin/Permitil)	Risperidone (Risperdal)
Perphenazine (Trilafon)	Ziprasidone (Geodon)
Trifluoperazine (Stelazine)	Aripiprazole (Abilify)
Chlorprothixene (Taractan)	
Thiothixene (Navane)	
Haloperidol (Haldol)	
Pimozide (Orap)	
Molindone (Moban)	
Loxapine (Loxatane)	

Extrapyramidal symptoms

- **Akathisia** - a feeling of inner restlessness and a compelling need to be in constant motion
- **Dystonia** - Involuntary movements and prolonged muscle contraction that result in twisting body motions, tremors, and abnormal posture
- **Akinesia** - The state of being without movement
- **Muscle stiffness**
- **Parkinsonism**
- **Tardive dyskinesia**

Tardive dyskinesia

Can be caused by antipsychotic drugs

Occurs in about 14% of patients with chronic use of antipsychotic drugs

Involuntary choreiform movements affecting lips, tongue, jaw, limbs.

May include lip smacking, repetitive tongue protrusions, repetitive chewing motion.

The risk of development and the likelihood that it will become irreversible are related to both dosage and duration of treatment.

Established	Less well-established
Duration of antipsychotic exposure	African American/Afro-Caribbean
Preexisting mood disorder	Diabetes mellitus
Age >50	Cigarette smoking
Female sex	History of akathisia or extrapyramidal side effects

A handful of candidate genes from pharmacogenetic association studies have been associated with TD susceptibility—e.g., the *DRD4* and *DRD2* variants of the gene coding for the dopamine D2 receptor; the *CNR1* (cannabinoid receptor 1); or the *MTNR1A* (melatonin receptor 1A), among others.

Goldberg 2021

Neuroleptic-associated choking

100X

The incidence of asphyxiation in psychiatric hospitals is 100x that of the normal population.

Approximately 40% of choking incidents are related to drug-induced dysphagia or tardive dyskinesia.

Polypharmacy

Defined generally as the use of 5 or more medications

This cut-off point of 5 drugs is associated with the risk of adverse outcomes such as falls, frailty, disability, and mortality in older adults.

22% of adults 40+ have taken 5 or more prescription medications in the last 30 days. – This is in the general population. Imagine within the long term care setting?

Mairnoon et al 2017

Polypharmacy risks in dementia

Study based on 1.2 million people with dementia, based on data from Medicare. Examined medication use from the following medication classes: Antidepressants, Antipsychotics, Antiepileptics, Benzodiazepines, Opioids

In older adults, prescribing only **three** or more of these types of drugs is called **central nervous system (CNS)-active polypharmacy**, and may increase the risk of **falls, overdoses, memory problems, and death**.

Nearly 70% of the study population was prescribed at least one of these medications at least once during the study period

13.9% met the definition of CNS-active polypharmacy, having taken three or more of these drugs for more than one month.

Mauet et al 2021

Polypharmacy data among our patients

Number of prescribed oral medications

- <5 meds: 6 (10%)
- 5-10 meds: 29 (48%)
- >10 meds: 25 (42%)

Data from 60 SA Swallowing Services
FEES studies in 2023 (SNF, LTACH, IPR)



Carbidopa/Levodopa (Sinemet)

Commonly prescribed treatment for Parkinson's Disease

May cause numerous ADRs related to dysphagia, including: reduced appetite or anorexia, nausea/vomiting, xerostomia, GI bleeding, constipation, confusion, extrapyramidal symptoms and dyskinesias

Opioid analgesics

May cause: Sedation and altered mental status, constipation, nausea/vomiting, xerostomia, impaired GI secretions, reduced esophageal and GI motility, dizziness, respiratory depression

Commonly seen: Morphine, Methadone (Dolophine), Hydromorphone (Dilaudid), Fentanyl, Meperidine (Demerol), Codeine, Oxycodone (Percocet, Oxycontin), Hydrocodone (Vicodin, Lortab)

Non-opioid analgesics

Fairly **low** risk of dysphagia as ADR

Most common dysphagia-adjacent risk is GI upset or esophageal injury, and ulceration at high dosage or with chronic use.

Commonly seen: Acetaminophen (Tylenol), Aspirin, Ibuprofen, Naproxen

Antidepressants

SSRIs (Selective Serotonin Reuptake Inhibitors)

- Citalopram (Celexa), Escitalopram (Lexapro), Fluoxetine (Lexapro), Fluoxetine (Prozac), Paroxetine (Paxil), Sertraline (Zoloft)
- Primary dysphagia risk is GI-related ADRs (decreased/increased appetite, nausea/vomiting, diarrhea, impaired GI motility, constipation)

Atypical Antidepressants

- Bupropion (Wellbutrin), Mirtazapine (Remeron), Nefazodone (Serzone), Trazodone
- Primary dysphagia risk is sedation/AMS

Antianxiety drugs (Benzodiazepines)

May cause: Sedation, decreased coordination, decreased attention to task of eating, increased reflux, nausea/vomiting, diarrhea, decreased appetite, taste alterations, xerostomia, constipation.

Commonly seen: Alprazolam (Xanax), Clonazepam (Klonopin), Diazepam (Valium), Lorazepam (Ativan)

ADRs are increased in patients with liver dysfunction. **Combination of these drugs with ethanol profoundly increases the side effects.**

Anticonvulsants

Commonly seen: Gabapentin (Neurontin), Lamotrigine (Lamictal), Levetiracetam (Keppra), Phenytoin (Dilantin), Topiramate (Topamax), Carbamazepine (Tegretol)

May cause: Sedation, decreased coordination, inattention to eating, nausea/vomiting, loss of appetite, diarrhea.

Special consideration: **Gingival Hyperplasia** can occur with the drug **Phenytoin (Dilantin)**. This is a condition causing overgrowth of the gums, which in severe cases can partially or fully cover the teeth.

Special consideration: **Phenytoin (Dilantin)** and **Carbamazepine (Tegretol)** can cause toxicity to the cerebellum with resulting ataxia and pronounced oropharyngeal dysphagia

Alzheimer's Disease medications

Commonly seen: Donepezil (Aricept), Rivastigmine (Exelon), Galantamine (Rемinyl), Memantine (Namenda)

May cause: Nausea/vomiting, diarrhea, anorexia, drowsiness

Case Study

- 67 y/o male with a hx of bipolar disorder with manic depression and panic attacks.
- Additional history of GERD, previously well controlled with prescription and OTC PPIs.
- Has long been prescribed Klonopin (Clonazepam) for panic attacks. This belongs to the benzodiazepine class of medications.
- Recently, patient had been hospitalized with concern for Klonopin abuse/intentional overdosing.
- Patient now in SNF for rehabilitation following Covid-19 infection.
- Patient complaining of recent increased reflux symptoms, to the point that they had become unmanageable.
- Patient's medication list: Carvedilol, Digoxin, Guanfacine, Furosemide, Clonazepam, Atorvastatin, Pantoprazole, Buspirone, Fluvoxamine, Bupropion, Levothyroxine, Mirtazapine (12)

Case Study – Findings/Recommendations

Diagnosis: Oropharyngeal swallow is WFL. Evidence of poorly controlled esophageal dysphagia.

Findings: Oral Phase: Within functional limits; dry regular solids require liquid wash.

Pharyngeal peristalsis: Within functional limits. There is no pattern of pharyngeal residue.

Airway protection: Within functional limits. There is NO aspiration. One episode of high penetration, cleared immediately and independently, does not represent a pattern of dysphagia.

Given the results of this study, continuation of an oral diet is recommended, without modification. Pharyngeal/laryngeal erythema are suspicious for poorly controlled reflux, and patient's complaints are also consistent with this suspicion. Given the recent concern for over-intake of prescribed benzodiazepines, as well as a relatively high number of prescribed medications, it is possible that patient is experiencing an acute exacerbation of his pre-existing GERD, as both of these are risk factors for increased GERD symptoms. Re-evaluation of esophageal functioning and re-assessment of current medical intervention for GERD are recommended.

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Questions?

For a handout with the slides from this presentation, feel free to email me at christinaweverett@gmail.com
