Pills! Pills! Pills! The Perils of Polypharmacy

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Introduction

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Scott brings 20+ years of pharmacist experience to Infinity Pharmacy Solutions in his role as the Director of Clinical Services. Board Certified in Geriatrics (BCGP) and Pharmacotherapy (BCPS), Scott is passionate about medication management and appropriate prescribing in older adults.

Scott's career began in community pharmacy with responsibilities including single-unit and multiple-unit management. In 2014, he transitioned to skilled nursing consulting building and training his own team of consultant pharmacists to service a 40+ unit skilled nursing facility portfolio. Dedicated to educating the next generation of pharmacists about senior care pharmacy, Scott is active in precepting pharmacy students during their final year of schooling. Scott has served on the State of Texas Medicaid Drug Utilization Review Board helping ensure medication access to the Texas Medicaid population. He is currently a member of the Board of Directors of the American Society of Consultant Pharmacists.

Scott is married to his wife, Amie, and has a daughter and two sons. In his free time, Scott enjoys running, coaching grade school cross country and track & field, and spending time with his wife and kids.

Scott graduated from Duquesne University in Pittsburgh, Pennsylvania with his Doctorate of Pharmacy and Texas Tech University with his Masters in Healthcare Administration.

Conflict of Interest

- No conflicts to disclose

A day in the life of polypharmacy

Table 1. Jellybean Polypharmacy Simulation Exercise (JPSE) Regimen

"Medication"	Directions
Orange Jellybean Contin	Take 1 orange jellybean by mouth every 12 hours.
Green Jellybean-nitrate	Take 1 green jellybean by mouth three times a day at 8 a.m., noon and 4 p.m. (**Do not take later than 4 p.m. to ensure a green jellybean-free interval.**)
Yellow Jellybean-zine	Take 1 yellow jellybean by mouth every 8 hours.
Purple Jellybean-dronate	Take 1 purple jellybean by mouth each morning 30 minutes before eating, with a full 8-ounce glass of water. Do not lie down for 30 minutes after taking this jellybean.
Black Jellybean-alexin	Take 1 black jellybean by mouth every 6 hours until gone.
Brown Jellybean-astatin	Take 1 brown jellybean by mouth at bedtime. (**Separate administration from orange jellybean by at least 2 hours.**)
Red Jellybean-alol	Take 1 red jellybean by mouth twice daily.
White Jellybean-azole	Take 1 white jellybean by mouth 15 minutes before each meal.

Orange Jellybean Contin	2:36pm	3:00pm		
Green Jellybean-nitrate	2:36pm	2:44pm	2:52pm	
Yellow Jellybean-zine	2:36pm	2:52pm	3:08pm	
Blue Jellybean-dronate	2:34pm			
Black Jellybean-alexin	2:36pm	2:48pm	3:00pm	3:12pm
Brown Jellybean-astatin	3:04pm			
Red Jellybean-alol	2:36pm	3:00pm		
White Jellybean-azole	2:36pm	2:44pm	2:56pm	

Learning Objectives

- Understand the definition and scope of polypharmacy and its prevalence among older adults.
- Identify common risks and adverse effects associated with polypharmacy in older adults.
- Learn strategies for conducting comprehensive medication reviews and assessments.
- Explore methods to reduce unnecessary medications and optimize therapeutic regimens.
- Develop approaches to collaborate with interdisciplinary teams for better medication management.

- Find your one thing to take away…I'll give some at the end

A patient's journey

- Gary lives with his wife in Ohio. He is a retired schoolteacher and loves fishing. At 65 he is prescribed medications for high blood pressure and high cholesterol. At 72 he is diagnosed with diabetes and prescribed medication to control his blood sugar. Updated guidelines put Gary's blood pressure in a higher risk category and he is prescribed another blood pressure medication. Gary feels lightheaded at the grocery store, falls, and breaks his leg. He is given an opioid. Out of the hospital Gary has trouble sleeping and feels depressed. Unaware of the opioid, PCP provides sleeping pills and antidepressants. A couple weeks later he gets the flu and becomes dehydrated leaving him more at risk for medication side effects. Dizzy and confused he rears ends a car at a stop light. His family believes he is showing signs of dementia. Gary is placed in a nursing home and with lack of appropriate medication management dies 3 years later.

What is Polypharmacy

- Polypharmacy A term used in the scientific literature to describe the condition of taking multiple medications. Usually the threshold for polypharmacy is five or more medications, although the cutoff varies because there is not a single agreed upon definition. Polypharmacy can be helpful or harmful, depending on the patient's conditions and the specific medications.
- Per the WHO, Polypharmacy is defined as "the administration of many drugs at the same time or of an excessive number of drugs"

What is Polypharmacy

- It is not inherently good or bad
  - Appropriate vs Inappropriate polypharmacy
- What number constitutes polypharmacy?
  - 5/9/12?
  - What is ‘excessive polypharmacy’
  - Researchers decide. Most research operates from 5 medications.

Why does Polypharmacy Matter

- In 2018 older adults in the U.S. sought medical care nearly 5 million times due to serious side effects from one or more medications. More than a quarter million of these visits resulted in hospitalizations, at a cost of $3.8 billion per the Lown Report
- Relevance to assisted living communities
  - Loss of revenue when permanently discharged to SNF

Why does Polypharmacy Matter? Prevalence Among Older Adults

- Increase in polypharmacy (5 or more meds) in older adults
  - 1994: 14%
  - 2014 42%
- Polypharmacy has become alarmingly common, especially among older people. Nearly 20 million older adults in the U.S. are taking five or more prescription medications. Including over-the-counter medications and supplements, 67 percent of older adults take five or more drugs.
- Long-term care residents: The rate of polypharmacy is 40 to 50 percent higher for residents in long-term care facilities, compared to older adults living in the community.

Scope of Polypharmacy

- If current trends continue, estimates are that medication overload will be responsible for at least 4.6 million hospitalizations between 2020 and 2030. It will cost taxpayers, patients and families an estimated $62 billion. Over the next decade, medication overload is expected to cause the premature death of 150,000 older Americans.
- The hidden epidemic unlike the opioid epidemic
  - Death is not an unexpected consequence in this population so rarely is it attributed to the medications

Risks and Adverse Effects

- Overview of risks associated with polypharmacy
  - Falls
    - Head injuries and fractures
  - Hospitalization
  - Adverse Drug Events
  - Mental Status Changes
    - Confusion, insomnia, dizziness, agitation
  - Internal Bleeding
  - Incontinence

Why Polypharmacy is a problem in older adults?

- Age related changes
  - Pharmacokinetics/Pharmacodynamics
- Living longer with chronic conditions
- Patient and physician interactions
  - A pill for every ill
- Direct to consumer pharmaceutical advertising

ADME - Pharmacokinetics

- How the body handles medication – What the body does to the drug
- Age related changes
  - Absorption
  - Distribution
  - Metabolism
  - Excretion
- Older adults lack the physiological reserve of the young – limited capacity to recover – Immunosenescence

Absorption

- Orally, topically, inhaled, injected
- Older Adults
  - Slowed gastric emptying
  - Decrease in stomach acid production
- Impact
  - Altered levels of absorption increasing adverse drug events for those with extra absorption or reduced effectiveness for those with less absorption
    - Example: Iron – less absorption and levodopa – more absorption

Distribution

- Medications carried through the bloodstream and then taken up by muscle or fat depending on nature of the drug
- Older Adults
  - Decreased lean muscle mass and increased body fat with decrease in total body water
- Impact
  - Fat soluble drugs may have higher concentrations and less total body water may and muscle may lead some medications to have prolonged effect or slower elimination
    - Example – Increased levels of digoxin, lithium or alcohol

Metabolism

- Medication form is changed to more water soluble to aide in elimination – primarily through the liver
- Older Adults
  - Decreased size of liver as well as decreased blood flow to the liver
- Impact
  - Decreased ability the metabolize drugs
    - Example – Longer duration of activity of benzodiazepines such as alprazolam and increased levels of blood pressure medications such as diltiazem and verapamil

Elimination

- Drugs are removed from the body – primarily through the kidney, but also feces and bile
- Older Adults
  - Decreased size of kidneys as well as blood flow to the kidneys
- Impact
  - Medications removed by the kidneys will have higher risk of adverse events
    - Example – NSAIDs – acute kidney injury

Pharmacodynamics

- How the drug affects the body – What the drug does to the body
- Receptor activity
- Conflicting receptor activity
- Mirtazapine and Clonidine
  - Alpha blocker and alpha agonist
- Donepezil and Oxybutynin
  - Muscarinic agonist and muscarinic antagonist
- Myrbetriq
  - Beta agonism can help BPH but harm blood pressure

Guidelines Schmidelines

- Per CMS 69 percent of older adults are diagnosed with 2 or more chronic health conditions and 18 percent have 6 or more!
- Older adults are often not recognized in guidelines or included in clinical trials due to exclusion factors.
- Hypertension could be 2-4 meds
- Diabetes could be 2-4 meds
- Post-MI could be 5 meds
- Heart Failure could be 4 meds
- Plus OTCs
- It is easy to assume this is appropriate polypharmacy

Patient and Physician Expectations

- A pill for every ill
- New medications at the mentioning of a symptom to MD
  - “I wasn’t sleeping well” or “My stomach was bothering me”
  - Writing a prescription is an easy way to ‘end’ an appointment
- “Slow Medicine”

“Slow medicine”

- Pause – Start Low and Go Slow
- Consider the whole patient
- Person centered care discussing the risks and benefits of treatments, non-treatments, and current care setting placement.

Direct to consumer advertising (DCTA)

- In 2023, spending topped $2.5 billion dollars on the top ten DTCA products alone. Some pharmaceutical companies spend nearly $500 million in advertising for one product.
- What is impact on physician prescribing practices
  - Patient satisfaction scorecards could alter physicians prescribing
  - Per the FDA physicians complied with DTCA requests 76% of the time

What causes Polypharmacy? The Drivers of Medication Overload

- Culture of Prescribing
- Information and Knowledge Gaps
- Fragmentation of Care

Culture of prescribing and it's consequences

- With a culture of prescribing comes medications that are known to cause problems(potentially inappropriate medications aka PIMs) in older adults and medications that lead to prescribing of other medications

Polypharmacy and Prescribing Cascades

- A prescribing cascade occurs when an adverse drug reaction (ADR) is misinterpreted as a new medical condition, leading to the prescription of another medication to treat the perceived new condition, potentially resulting in further harm and polypharmacy.
- Prescribing cascades
  - Donezil → Oxybutynin
  - Ace Inhibitors → Cough Suppressants → Delirium
  - Gabapentin → Edema → Diuretic (+ Potassium)
  - Singulair → Agitation → Antipsychotics
  - NSAID → GI Upset → PPI
  - Ferrous Sulfate → Constipation → Miralax

Beers List (PIMS)

- List of medications that should be avoided or used with caution in older adults due to potential risks and adverse effects. It aims to improve medication safety and reduce inappropriate use in this population.
- The original Beers Criteria was developed in 1991 by Mark H. Beers, MD, and colleagues
- The criteria are regularly updated by the American Geriatrics Society (AGS) to reflect new evidence and research.
- Most recent update was in 2023

STOPP/START(PIMS)

- STOPP/START stands for "Screening Tool of Older Persons' Prescriptions" and "Screening Tool to Alert doctors to Right Treatment". They are a set of criteria used to identify medications that should be stopped (STOPP) or started (START) in older patients to improve their medication regimen
- The primary goal of STOPP/START is to reduce the incidence of medicines-related adverse events resulting from potentially inappropriate prescribing and polypharmacy in older adults

The Terrible Triangle

- Anticholinergic Burden
- Serotonergic Burden
- QTc Prolongation Burden

Adverse Drug Reactions/Interactions

Types of drug interactions

- Pharmacokinetic – CYP interactions
- Pharmacodynamic – Receptor interactions

Real Life Examples

- Megace to Eliquis to Bleed
- Potassium sticks around after Lasix DC
- Lisinopril and Bactrim

750 hospitalizations every day due to ADE in older adults

Medication Non-adherence

- Medication adherence — i.e., taking medications as prescribed — decreases as the number of prescriptions increases: about 80 percent of patients on one medication take them as prescribed, compared to just 51 percent of patients on four or more medications. When patients are overburdened by prescriptions, they may neglect critically important drugs, which can lead to a deterioration in health and a decline in quality of life.
- Causes of non-adherence
  - Cost of medicines
  - Inability to follow directions
  - The Black Jellybean – people stop taking meds because they don't like how they make them feel
- Strategies to improve adherence
  - Accupak

Information and Knowledge Gaps

- Board Certified Geriatricians
  - 2000 : 10,000
  - 2022 : 7,400
- There are approximately 10,000 older adults per geriatrics trained physician
  - Lower pay than peers
  - Residencies go unmatched
    - 2022 177 out of 411 geriatric residencies matched
- Guidelines often lack how to manage multiple conditions

Fragmentation of Care

- Transitions of care reconciliation issues
  - Wrong meds/doses (VA ½ tablets), no stop dates, poor self historians
  - EMRs are not the answer due to lack of interoperability
  - Multiple prescribers – too many cooks in the kitchen

What to do?!

- Prescription check ups/Medication Regimen Reviews
- Raise awareness
- Improve transitions of care
- Train HCP on deprescribing

Medication Reviews/MRR

- Not required in Texas AL
- Partner with geriatric trained pharmacists on admission reviews
  - Not all pharmacists are created equal
- Benefits of regular reviews
- Impact on patient outcomes

Reducing Unnecessary medications/MRR

- Commonly over prescribed medications
  - PPIs, Anticoagulants, Oral Antidiabetics, Opioids, Ferrous Sulfate, Antibiotics, Benadryl – don't forget Tylenol PM
  - Anticoagulants, Antidiabetics, and Opioids represent up to 60 % of ED visits for ADR in older adults
  - Don't forget hypnotics, OTCS, blood pressure meds, and antipsychotics
- Criteria for identifying unnecessary medications

CMS - Unnecessary medications

- Dose without indication
- Excessive days
- High Dose
- Duplication
- Without monitoring
- Medications know to cause harm in older adults

Steps in conducting reviews/MRR

- Is this medication still necessary?
- Is there duplicate therapy?
- Could this medication be causing harm?
- Can we safely deprescribe or taper?
- Can we consolidate med pass times?

Is this medication still necessary?

- Statin? Donepezil? Namenda? Alendronate? Ferrous Sulfate?
- PRN agents? DC for nonuse
- Aggressive diabetic regimen – Sliding Scale Insulin monotherapy
- PPIs
- Hospice

Is there duplicate therapy?

- Easy to miss when one is brand and one is generic or same class but dissimilar names
  - Amlodipine and Diltiazem
    - Calcium Channel Blockers
  - Crestor and Atorvastatin
    - Statins – one is brand name one is generic
  - Escitalopram and Citalopram
    - Higher doses of Citalopram increase QTc prolongation

Could this medication be causing harm?

- Beers List Meds
- Anticholinergic Burden
- STOPP/START
- Serotonergic Burden
- QTC Prolongation

Can we safely deprescribe or taper?

- There is a difference between max dose and max tolerated dose as well as target dose and lowest effective dose
- BID PPIs
- Anticoagulants
  - Creatinine/Age/Weight

Deprescribing/MRR

- Adults aged 50-80
  - 82% take a prescription medication
  - 80% are willing to stop taking one or more medications if their heath care provider said it was possible
  - 26% had stopped taking at least one prescription medication taken for more than a year
  - Symptoms can rebound but it doesn't mean the deprescribing is a failure
    - Ride out the rebound

Can we consolidate med pass times?

- Don’t let staff get too comfortable with medications. Any medication is capable of causing harm.
- Medication Pass Observations to verify skills of staff administering medications
  - Right Person
  - Right medicine
  - Right route
  - Right dose
  - Right time
  - (and right reason and right documentation)

Raising Awareness

- Talk to families upon admission about the risks of polypharmacy
  - Medication needs may change as health care needs change
    - Statins should be prescribed with an asterisk
- Conversations with patients and responsible parties about goals of medication therapy

Consequences of Poor Transitions of Care

- Ineffective or duplicative care
- Medication Errors and Adverse Events
- Inadequate follow up
  - Amiodarone loading dose/Lovenox or ABX stop dates
- Increased hospital length of stay
- Excessive ED and urgent care visits
- Avoidable readmissions
- Increased health care cost
- Patient Dissatisfaction

Transitions of Care

- Medication Reconciliations
- Go through the steps above and conduct a medication regimen review for each medication each medication
- Medication cabinets and Medication carts clean outs
  - Only medications that should remain are current orders

Importance of Interdisciplinary Teams

- We all want the same goal – highest quality of life for the resident – we all just take different paths toward that goal – find where the paths intersect and overlap
- Benefits of collaboration
  - Just because something is on the Beers List doesn't mean it is always inappropriate
  - "I stopped writing Benadryl prescriptions because I was tired of getting your letters."
- Balancing efficacy and safety
  - Just because someone has 'always' been on it, doesn't mean they have to stay on it –even if the current prescriber didn't start the therapy they now take ownership of the therapy

Tools and Resources

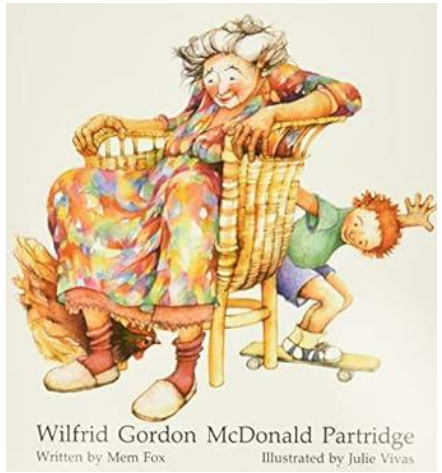
- American Society of Consultant Pharmacists (ASCP)
- American Geriatrics Society (AGS)
- PALTmed (PALTC)
- Choosing Wisely
- Beers List Pocket Cards
- The 4Ms
- Deprescribing.org
- Reach out to me

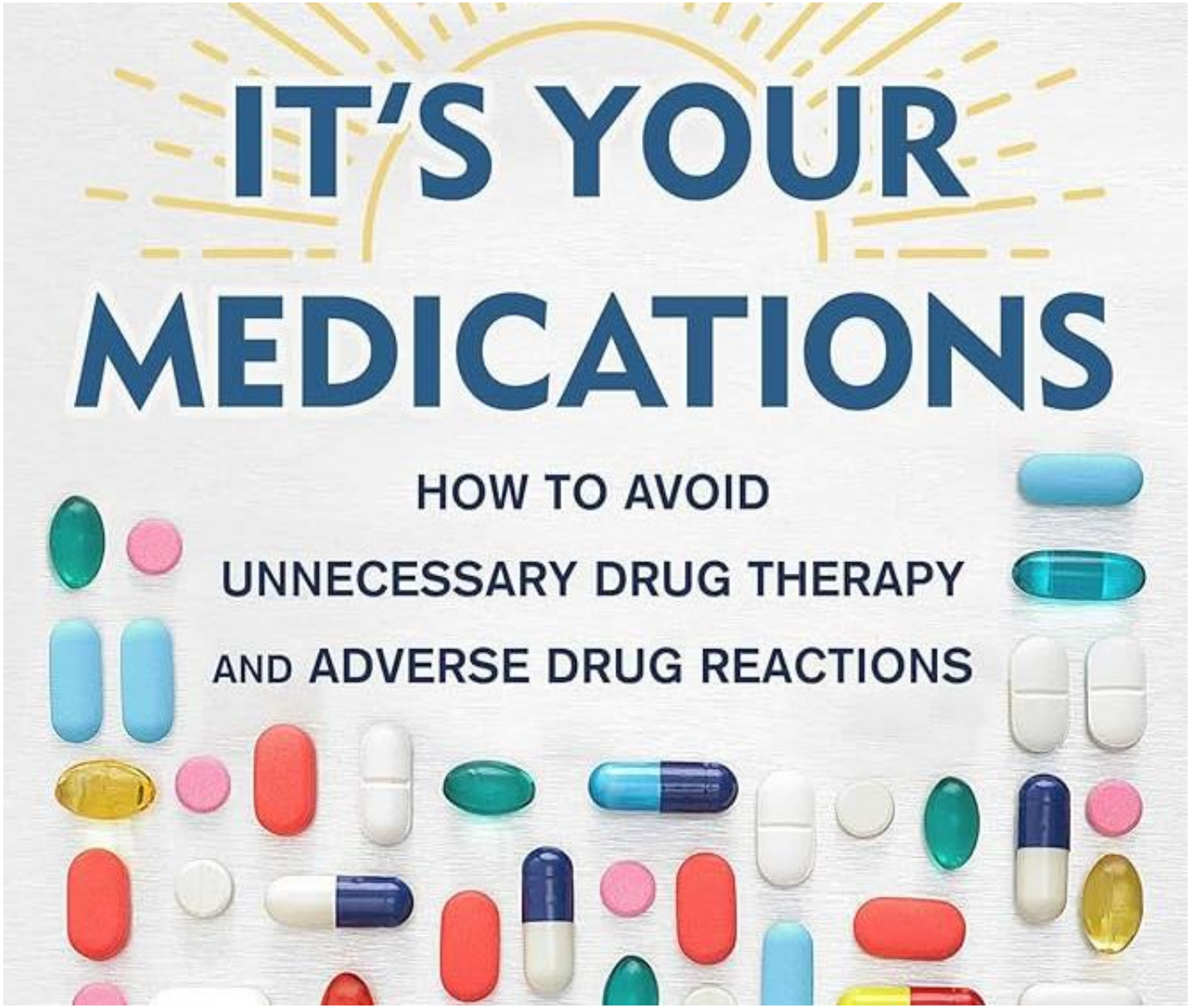
Remember Gary?

- Instead of antidiabetics – Gary tries lifestyle modification
- Instead of another high blood pressure medication a geriatrician decides the benefits of current regimen outweigh the risks of another blood pressure medication
- Hospital doctor puts stop date on opioid therapy, prescribes physical therapy, and routine acetaminophen
- Through conversation with Gary the PCP learns Gary's brother died and refers to grief counselor instead of giving and antidepressant and discusses sleep hygiene techniques
- With annual prescription check ups Gary lives at home until passing away peacefully at 92 yeas old

Atul Gawande

Being Mortal





Final Thoughts

- "Any symptom in an elderly patient should be considered a drug side effect until proven otherwise."--J. Gurwitz, et al. Long-Term Care Quality Letter, 1995.
- Partner with pharmacists for medication regimen reviews
- Provide stop dates for PRN medications and antibiotics
- Looks for opportunities to deprescribe
- Benadryl is never the answer
- Can we get rid of polypharmacy, likely not. But we can move from inappropriate to appropriate polypharmacy

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Questions and Answers

Thank you