Medications in Older Adults: Sometimes Less Is More

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The person who takes medicine must recover twice, once from the disease, and once from the medicine.
- Sir William Osler

Presentation Objectives
1. Appreciate the impact and consequences that polypharmacy and high risk medications in older adults have on clinical outcomes and healthcare costs
2. Identify high risk medications in older adults
3. Describe strategies to mitigate pharmacotherapy challenges, particularly polypharmacy and high risk medications, in older adults
4. Provide examples of medication combinations that should be avoided or used cautiously in older adults
5. Describe various tools that can be used to assist with medication therapy management and minimize risks in older adults
6. Describe the role pharmacists have in managing medications for older adults, particularly in an interprofessional setting, and how this can improve patient outcomes
Presentation Outline

- Polypharmacy, older adults, and its consequences
- Principles of aging
- Introduction to high risks medications in older adults and tools to mitigate risks
- Drug interactions and the prescribing cascade
- Dietary supplements
- Pharmacist interventions to improve medication regimens
- Overall recommendations and conclusions

Polypharmacy, Older Adults, and its Consequences

There is no Standard Definition for Polypharmacy

- No specific cut off point for number of medications
- Often clinicians think of polypharmacy as using more medications than clinically necessary
  - Medication not indicated
  - Medication not effective
  - Therapeutic duplications
- Polypharmacy can result in increased risk for negative health outcomes and increased healthcare costs

Polypharmacy is More Prevalent in Older Adults Due to Multiple Chronic Conditions

- Older adults 65 years and over make up under 14% of the US population but use 40% of all prescription drugs and 35% of all over the counter drugs.
- 65 to 69 years use on average 14 prescription per year.
- 80-84 years use on average 18 prescriptions per year.
- Analysis of Medicare enrollees discharged to skilled nursing facilities found an average of 14 medications.
- A study looking at outpatient older adults found about 58% took at least one unnecessary prescribed medication.

Polypharmacy Can Negatively Impact Clinical Outcomes

- Being on multiple medications associated with poorer health in older adults.
- Polypharmacy can:
  - Increase the use of high risk medications
  - Impair medication adherence
  - Increase drug interactions and adverse drug events
  - Increase risk of therapeutic duplications
  - Impair functional status and cognition (geriatric syndromes)
  - Increase risk of falls
  - Increase healthcare costs
- Potentially inappropriate medications (PIMs), often seen in polypharmacy, can result in negative health outcomes.
- One outpatient study found patients taking 5 or more medications had an 88% increased risk for an adverse drug event.
- Polypharmacy associated with greater risk of hospitalizations resulting from adverse drug events in older adults.

Adverse Drug Events is a Leading Cause of Hospitalizations in Older Adults

- In older adults, 28% of hospitalizations are due to an adverse drug event.
- Adults 65 and older are 2.5 times more likely to have an emergency room visit due to an adverse drug event than those under 65 years.
- Adverse drug events led to an estimated 99,628 hospitalizations per year for older adults from 2007-2009.
- Study of Medicare enrollees in 2003 found that 27.6% of adverse drug events were preventable.
- A Canadian study found 8.9 drug related problems per older adult patient, 2.5 of which were caused by drugs that were not needed.
As the Aging Population Increases, So Will the Number of Adverse Drug Events

- While people over 65 years represent about 14% of the US population, they account for more than 49% of adverse drug event-related hospitalizations.

- Patients 85 and older accounted for 3 times as many adverse drug event-related hospitalizations compared to those 65 to 69 years old.

- About 15% of older adults are at risk of a major drug-drug interaction in 2010-2011 compared to less than 9% in 2005-2006.

- From 2013-2014, over 34% of emergency department visits for adverse drug events occurred in adults 65 years or older compared with less than 26% from 2005-2006.


There is a Heavy Price Tag for Poorly Managed Medications

- In 2016, $328.6 billion was spent on prescription drugs.

- The estimated annual cost of drug-related morbidity and mortality in 2016 due to non-optimized medication regimens was $528.4 billion.
  - This represents 16% of total US healthcare spending

- $100 billion spent each year in excess hospitalization due to medication non-adherence.

Managing Medications in Older Adults Can be Challenging

• Multiple chronic comorbid conditions is associated with:
  • Increased risk factors
  • Polypharmacy
• Physiological changes due to aging affect how drugs are metabolized and cleared from the body
  • Hepatic and renal insufficiency
• Most studies looking at drug efficacy and safety have limited data for older adults
• Cognitive impairments limit patient’s ability to report new symptoms
• Drug adverse effects may instead be attributed to a medical condition

Physiological Changes Associated with Aging Alter Drug Pharmacokinetics

<table>
<thead>
<tr>
<th>Drug absorption</th>
<th>Decreased:</th>
<th>Note: Medications can change pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI mobility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI blood flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastric acid secretion</td>
<td>increased pH</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug Distribution</th>
<th>Decreased:</th>
<th>Increased unbound active drug (i.e. warfarin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle</td>
<td></td>
<td>Fat (i.e. benzodiazepines)</td>
</tr>
<tr>
<td>Total body water (i.e. antihypertensives)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma protein (albumin)</td>
<td>increased</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug Metabolism</th>
<th>Decreased:</th>
<th>Increased:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatic blood flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver mass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metabolic activity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug Excretion</th>
<th>Decreased:</th>
<th>Note: Medications often need to be renally dose adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal blood flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidney mass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glomerular filtration rate (GFR)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An Introduction to High Risk Medications in Older Adults and Tools to Mitigate Risks
Three Drug Classes Implicated in Almost 60% of Emergency Department Visits for Adverse Drug Events in Older Adults

<table>
<thead>
<tr>
<th>Class</th>
<th>Agents</th>
<th>Notable Adverse Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulants</td>
<td>Warfarin, rivaroxaban, dabigatran, enoxaparin</td>
<td>Bleeding</td>
</tr>
<tr>
<td>Diabetes agents</td>
<td>Insulin, glipizide, glibenpiride, glyburide, metformin</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Opioids</td>
<td></td>
<td>Excessive sedation, respiratory depression</td>
</tr>
</tbody>
</table>

**Aspirin and clopidogrel also among the most commonly implicated drugs in older adults resulting in emergency department visit**

### Inappropriate Use of Opioids Have Had Devastating Consequences

**Opioids killed more than 42,000 in 2016, or 198 people a day:**

- 40% of all opioid overdose deaths involve a prescription opioid.

**Prescription Opioid Misuse**

- When used correctly, prescription opioids are helpful for treating pain.
- The CDC outlined guidelines for safe prescribing of opioids.
- An estimated 11.5 million people misused prescription opioids—putting them at risk for dependence and addiction.
- 3 out of 4 people who used prescription opioids misused prescription opioids this year.

**Older Adults Who Use Opioids at Greater Risk of Harm**

- Older adults with recent opioid use are 2.4 times more likely to have a fall than any other type of injury and are at an increased risk of death.
- Polypharmacy, a multitude of comorbid conditions, hepatic and renal insufficiency and concurrent use of other CNS depressants can all put older adults at greater risk of respiratory depression.
CDC Opioid Guidelines Focus On Principles of Chronic Pain Treatment

- Nonpharmacological and non-opioid pharmacologic therapy
- Multimodal treatment plan for pain
- Identifying and addressing co-existing mental health conditions
- Functional goals and patient participation in pain management
- Disease-specific treatments when available
- Intervenational therapies when patients fail standard non-invasive therapies

Opioids Are Not First-Line For Chronic Pain But If All Else Fails…….

- Start low and go slow
- Avoid benzodiazepine and opioid combination
- Opioid related overdose risk is dose-dependent
- Frequent monitoring and assessments using validated tools (i.e. ORT, PEG)
- Extended release/long acting reserved for severe continuous pain
- Utilization of drug screening and Prescription Drug Monitoring Programs (PDMP)

FDA Has Strong Warning Against the Concurrent Use of Opioids and CNS Depressants

In 2016, a Black Box Warning was issued stating concomitant use of opioids and CNS depressants may increase risk of respiratory depression and death
CNS Agents that Can Cause Sedation Include:

- Anticonvulsants
- Benzodiazepines
- Opioids
- Antidepressants
- Antipsychotics
- Sedative-hypnotics (non-benzodiazepine benzodiazepine receptor agonist)

Did You Know: Concurrent Use of Pregabalin and Opioids is Associated with Increased Risk of Opioid Related Death

- Similar interaction already observed with gabapentin + opioids
- Use of gabapentinoids (gabapentin and pregabalin) has tripled in the U.S. from 2002 – 2015
- Centers for Medicare & Medicaid labels gabapentinoids as "potentiators"
  - Potentiator = a drug that when taken with opioids increases risk of adverse effects

The Beers Criteria is an Evidence Based Tool to Improve Care of Older Adults by Reducing Their Exposure to PIMs

- Beers Criteria identifies PIMs = Potentially Inappropriate Medications
- Improve medication selection and special considerations in older patients
- Educate clinicians and patients
- Reduce adverse drug events and improve patient outcomes
- Consideration of safer and/or more effective alternatives
  - Including nonpharmacological therapies
- Serve as a tool for evaluating quality of care, cost, and patterns of drug use in older adults
The Beers Criteria is Not All-Inclusive

- Beers Criteria is applicable to all older adults except those in palliative and hospice care
- Focus is mainly on chronic health conditions
- Beers Criteria lists PIMs best avoided in older adults in general and focuses on:
  - Certain diseases or syndromes
  - Prescribed at reduced dosage
  - Caution or carefully monitored
  - Drug interactions

Beers Criteria is a Warning Light

- Tool to assist in decision making for medications to avoid in older adults but not meant to override clinical judgment
- Medication not definitely inappropriate but requires special scrutiny
- Some medications only inappropriate in certain circumstances
- Individualize decision making:
  - Patient-centered
  - Drug appropriateness and safety
- Closer monitoring of medication therapy
- Team approach:
  - Prescribing
  - Monitoring patient

Beers Criteria Evidence on Drug-Related Concerns and Adverse Drug Events in Older Adults is Graded

- Each PIM recommendation is graded based on:
  - Quality of evidence
  - Strength of recommendation
**Additions to 2015 Beers Criteria Include Dose Adjustments and Drug-Drug Interactions**

- Lists selected drugs to be avoided or dose adjusted based on individual kidney function
  - List not comprehensive but rather highlights potentially important renal adjustments particularly important for older adults
- Potentially clinically important drug-drug interactions in older adults
- Encourage use of non-pharmacological approaches to avoid drugs with high risk of adverse event
  - Person-centered approach to care in older adults and in persons with dementia and delirium

**Examples of Significant Changes to PIMs in 2015 Beers Criteria**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Rationale for Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid Nonbenzodiazepine, benzodiazepine receptor (zolpidem, zaleplon, eszopiclone) agonist hypnotics for any duration of use</td>
<td>Minimal efficacy in treating insomnia and increased risk of falls, fractures, cognitive impairment, delirium</td>
</tr>
<tr>
<td>Avoid proton-pump inhibitors (PPI) beyond 8 weeks without justification</td>
<td>PPI use associated with C. difficile infection, bone loss, and fractures</td>
</tr>
<tr>
<td>Digoxin avoided as 1st line therapy for atrial fibrillation or heart failure and not prescribed in daily doses &gt; 0.125mg for any indication</td>
<td>May increase risk of death; decreased renal clearance</td>
</tr>
</tbody>
</table>

**Did You Know: PPIs Impair the Absorption Of**

- Calcium → 35% higher risk of hip fracture in women using PPIs for 2 years or greater
- Iron
- Magnesium
- Vitamin B12
- Azole antifungals
- Thyroid hormone

Examples of Significant Changes to Drug-Disease and Drug-Syndrome PIMS in 2015 Beers Criteria

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid nonbenzodiazepine, benzodiazapine receptor agonist hypnotics in patients with dementia or cognitive impairment</td>
<td>Adverse CNS effects, increased risk of falls</td>
</tr>
<tr>
<td>Avoid opioids in patients with history of falls or fractures unless pain management due to recent fractures or joint replacement</td>
<td>Increased fall risk. If opioids must be used, consider reducing use of other CNS-active medications</td>
</tr>
<tr>
<td>Avoid antipsychotics to control behavioral problems in dementia and delirium unless nonpharmacological options have failed or are not an option and older adult is a threat to self or others</td>
<td>Associated with significant risks and uncertain effectiveness in delirium and dementia</td>
</tr>
</tbody>
</table>

Did You Know: The FDA Has Strong Warnings for Antipsychotic Use in Dementia Patients

All antipsychotics have a Black Box Warning for use in dementia patients due to increased risk of death

2016 Evidence Based Guidelines from American Psychiatric Association (APA) Recommend Judicious Use of Antipsychotics

- Nonpharmacological interventions are first-line
- Non-emergency antipsychotics should only be used in dementia patients when symptoms are severe enough to cause harm to patient or others
- Risk versus benefit assessment
- Monitor for side effects and discontinue if risks outweigh benefits
- Dual drug and non-drug treatment plan that is patient-centric
APA Emphasizes Short Durations and Low Doses of Antipsychotics

- Lowest effective dose (with slow titration)
- If no significant response after 4 weeks, taper and discontinue
- If patient is stable/asymptomatic within 4 months of starting, attempt to taper and discontinue
- Assess at least every month during tapering and for at least four months after discontinuation

Medications with Anticholinergic Properties Increase Risks for Cognitive Impairment, Delirium, and Dementia

Commonly Seen Culprits:
- Diphenhydramine
- Hydroxyzine
- Benztropine
- Tricyclic antidepressants (i.e. nortriptyline)
- Paroxetine
- Oxybutynin
- Promethazine
- Olanzapine
- Cyclobenzaprine

Common Anticholinergic Adverse Effects Include…
- Confusion
- Memory impairment
- Dry mouth
- Decreased sweating
- Urinary retention
- Constipation
2018 Beers Criteria Update Will be Released Soon

- Draft version currently available and open for public comment
- More relevant and practical to older adults
  - Removal of medications on list no longer on U.S. market or with low use
  - Removal of drug disease interactions not unique to older adults
    - Syncope
    - Seizures
    - Insomnia

Examples of Additions Made to Medications to be Used Cautiously and Important Drug Interactions

<table>
<thead>
<tr>
<th>Drug Name or Class</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipeptidyl peptidase 4 (DPP-4) inhibitors</td>
<td>Increased risk of hospitalization in heart failure</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>Increased risk of bleeding</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>Increased risk of hyperkalemia in combination with ACEI/ARB in reduced kidney function</td>
</tr>
<tr>
<td>Dextromethorphan/quinidine</td>
<td>Questionable efficacy and increased risk of falls and drug interactions</td>
</tr>
</tbody>
</table>

Other Noteworthy Examples From 2018 Beers Criteria Draft

- Specific definition and recommendations regarding “sliding scale” insulin
- Broad recommendation against the use of:
  - Three or more CNS agents due to increased risk of falls
  - More than one agent that can increase potassium levels
- Important interactions with antibiotics are noted
  - Particularly warfarin – antibiotic interactions due to increased risk of bleeding
- For primary prevention, suggest aspirin be used cautiously in patients 70 or older instead of 80 years or older as was previously recommended
My Overall Impression of the 2018 Beers Criteria Draft

- Recommendations emphasize judicious use of commonly used medications in older adults
  - Highlight serious interactions of commonly used medications with antibiotics
- Aspirin controversy
- Recommendations well aligned with CDC guidelines and FDA warnings
  - Highlight the seriousness of combining CNS agents

Beers Criteria Can Be Used in Conjunction with Other Tools: STOPP/START

- STOPP: Screening Tool of Older People’s Prescriptions
  - Potentially inappropriate medications (PIMs)
  - STOPP criteria includes potentially inappropriate prescribing that are not mentioned in Beers Criteria
- START: Screening Tool to Alert to Right Treatment
  - Potential prescribing omissions (PPOs)
- STOPP/START criteria associated with adverse drug events in acutely ill older adults

Deprescribing Can Address Polypharmacy and Improve Safety by Stopping Agents that Lack Utility

- Examples of deprescribing:
  - Benefits may not outweigh risks
    - Antipsychotic to manage behavioral symptoms in a dementia patient
    - Benzodiazepines or sedative-hypnotics for sleep
    - Opioids for chronic musculoskeletal pain
    - Diphenhydramine to treat allergies in a dementia patient
  - Medication to treat an acute condition is continued and used chronically
    - Loperimide for diarrhea
    - Guaifenesin for cough
    - Pseudoephedrine for nasal congestion
  - Limited evidence for benefits of use
    - Statins for primary prevention in patients 75 years or older
  - Duplication in therapy
    - Patient on two different SSRIs

An Evidence Based Antipsychotic Degescribing Algorithm

CDC’s STEADI (Stopping Elderly Accidents, Deaths, and Injuries) Toolkit
- CDC’s Injury Center created this toolkit for healthcare providers caring for older adults at risk of falling or who may have fallen in past
- Screen, assess, and intervene to reduce fall risk
- Per CDC:
  - 1 out of 4 people 65 and older fall each year
  - Over 3 million treated in emergency department annually for fall injuries

SAFE: Medication Review Framework

SCREEN for medications that may increase fall risk.
- Obtain and reconcile the medication list
- Group medications based on medical conditions
- Identify medications that may increase risk or have potential interactions
- Consider adjusting medications based on age, kidney, and liver function
- Use labs, health, and prescription history, and prescription monitoring data

1. Includes Rx drugs, OTC, supplements, allergies, alcohol use, and recreational drugs
SAFE: Medication Review Framework

ASSESS the patient to best manage health conditions.
Discuss the following:
- Treatment goals
  - Current medication regimen
  - Side effects experienced
  - Non-pharmacologic options
  - Patient values and preferences
  - Barriers to care

2. Examples: low health literacy, physical or cognitive impairment, socioeconomic barriers that may affect medication adherence

SAFE: Medication Review Framework

FORMULATE the patient’s medication action plan.
- STOP medications when possible
  - SWITCH to safer alternatives
  - REDUCE medications to the lowest effective dose
  - Simplify the dosing regimen
  - Develop a monitoring plan for medication side effects
  - Explore non-pharmacologic options to manage medical conditions
  - Incorporate patient preferences and solutions to identified barriers

3. Or consider tapering

SAFE: Medication Review Framework

EDUCATE the patient and caregiver about medication changes and fall prevention strategies. Discuss the following:
- Steps for implementing an action plan
- Reasons for medication changes
- Importance of referrals to specialists
- Other approaches to reduce fall risk
CDC’s Medications Linked to Falls

STOP medications when possible.
SWITCH to safer alternatives.
REDUCE medications to the lowest effective dose.

Check for psychotropic medications, such as:
- Antidepressants
- Antipsychotics*
- Sedatives-hypnotics

*Antidepressants: TCAs and SSRIAs
*Sedatives-hypnotics: eszopiclone, zaleplon, and zolpidem

Review prescription drugs, over-the-counter medications, and herbal supplements. Some can cause dizziness, alteration, confusion, blurred vision, or orthostatic hypotension. These include:
- Antihistamines
- Medications affecting blood pressure
- Muscle relaxants

Develop a patient plan that includes medication changes, and a monitoring plan for potential side effects. Implement other strategies, including non-pharmacologic options to manage conditions, address patient barriers, and reduce fall risk.

Drug Interactions and the Prescribing Cascade

Avoid Duplications in Drug Therapy
- Redundant use of two different medications with same effect
- At greater risk for toxicity and adverse effects
- For example:
  - A patient on two statins
  - A patient on two beta blockers
  - A patient on ACEI and ARB

Image credits:
Avoid Drug-Drug Interactions

• Concurrent use of two or more different medications results in an adverse effect

• Examples:
  - Warfarin + NSAID → Bleeding
  - Paroxetine + cyclobenzaprine + tramadol → Serotonin Syndrome
  - Lisinopril + spironolactone → Hyperkalemia
  - Furosemide + escitalopram → Hyponatremia
  - Fluoroquinolone + citalopram → QT prolongation
  - Gemfibrozil + atorvastatin → Myopathy
  - Metoprolol + diltiazem → Bradycardia, AV block

Did You Know: Triple Therapy with an NSAID, Diuretic, and ACEI or ARB……

• Is associated with a 31% increased risk for acute kidney injury¹

Did You Know: Many Antibiotics are Contraindicated When Used in Combination with Certain Medications

• U.S. cross-sectional study with data from 2003-2011 found over 1.2 million patients prescribed antibiotic with a contraindicated drug
  - Most common was macrolide + statin
  - Second most common fluoroquinolone + antiarrhythmic
Avoid Drug-Food Interactions

- Grapefruit juice
- Some statins
- Alcohol
  - Antihistamines, acetaminophen, NSAIDs, opioids, statins, warfarin, benzodiazepines, antidepressants, antipsychotics
- Potassium containing foods
  - Potassium sparing diuretics, ACEI, ARB
- Vitamin K containing foods
  - Warfarin

Avoid Drug-Disease Interactions

- Treatment for one condition worsens a co-existing condition
- Examples:
  - Anticholinergic use for incontinence worsens Alzheimer’s or Parkinson’s Disease management
  - NSAID use for pain in patient with chronic kidney disease worsens kidney function
  - Hydrochlorothiazide use in patient with hypertension and history of gout results in hyperuricemia

Commonly Used Drugs Can Exacerbate or Initiate Heart Failure

<table>
<thead>
<tr>
<th>Drug Name or Class</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>Mechanism: Water and sodium retention</td>
</tr>
<tr>
<td>COX-2 Inhibitors</td>
<td>Mechanism: Water and sodium retention</td>
</tr>
<tr>
<td>Thiazolidinediones</td>
<td></td>
</tr>
<tr>
<td>DPP-4 Inhibitors</td>
<td>Saxagliptin, sitagliptin but may be a class effect</td>
</tr>
<tr>
<td>Antiarrhythmics</td>
<td>Flecainide, disopyramide, sotalol, dronedarone Mechanism: Negative inotrope, proarrhythmic</td>
</tr>
<tr>
<td>Calcium Channel Blockers</td>
<td>Diltiazem, verapamil Mechanism: Negative inotrope</td>
</tr>
<tr>
<td>Itraconazole</td>
<td>Mechanism: Negative inotrope</td>
</tr>
<tr>
<td>Citalopram</td>
<td>Mechanism: QT prolongation</td>
</tr>
<tr>
<td>Pramipexole</td>
<td></td>
</tr>
<tr>
<td>Beta Blockers</td>
<td>Including ophthalmic agents</td>
</tr>
</tbody>
</table>
NSAIDs Carry Many Serious Risks Especially in Older Adults

- Increased risk of ¹-²
  - Heart failure exacerbations
  - Stroke
  - Heart attack
  - GI bleeding (take with food!)
  - Peptic ulcer disease
  - Acute kidney injury
- Heart attack and stroke risk can increase within first week of use¹

² Circulation. 2007; 115: 1634-42
Dietary Supplements Are Diverse and Used for a Broad Array of Conditions

• Supplements include:
  • Vitamins
  • Minerals
  • Herbas
  • Amino acids
  • Enzymes and botanicals
  • Probiotics
  • Fish oil
  • And many others……..

Older Adults Often Use Dietary Supplements

• Supplements are not FDA approved and are available over the counter
• 70% of older Americans use at least one supplement daily
• 29% of older Americans use 4 or more supplements daily
• Supplement use increases with age
• Those on prescription medications are more likely to use supplements

Dietary Supplements ≠ Always Safe

• Important for patients to share all medications being used with healthcare providers, including over the counter medications and supplements
• Some supplements can interact with other medications, decrease the efficacy of other medications, or have adverse effects
• Increased bleeding risk is a serious adverse effect for some supplements
Many Herbs and Supplements Can Increase Bleeding Risk

<table>
<thead>
<tr>
<th>Herbs/Supplements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ginkgo biloba</td>
</tr>
<tr>
<td>Dong quai</td>
</tr>
<tr>
<td>Feverfew</td>
</tr>
<tr>
<td>Garlic</td>
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<tr>
<td>Ginseng</td>
</tr>
<tr>
<td>Licorice</td>
</tr>
<tr>
<td>Willow bark</td>
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<tr>
<td>Omega 3 fatty acids (fish oil)</td>
</tr>
</tbody>
</table>

This Risk of Bleeding Is Higher When Used in Combination With Other Drugs That Can Cause Bleeding

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiplatelets</td>
<td>Aspirin</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>Naproxen</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>Warfarin</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Fluoxetine</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>(GI bleeding with long term use) Prednisone</td>
</tr>
</tbody>
</table>

Did You Know: St. John’s Wort Can Increase Risk of a Potentially Serious Condition

- Used in patients for depression
- Increased risk of serotonin syndrome especially when used in combination with other serotonergic drugs (i.e. SSRIs, SNRIs, TCAs)
- St. John’s Wort can also cause photosensitivity
Supplements and Food Can Affect Absorption of Some Important Medications

- Example
  - Patients on levothyroxine for hypothyroidism must remember to separate from iron, magnesium, calcium, and aluminum
  - Dairy products such as milk can impair absorption
  - Recommend taking levothyroxine 30-60 minutes before breakfast

Pharmacist Interventions

- Medication therapy management (MTM)
- Patient education
- Deprescribing
- Transitions of Care
  - Medication reconciliation
  - Continuity of care
- Management of chronic conditions
  - Hypertension
  - Hyperlipidemia
  - Diabetes
- Nonpharmacological interventions
  - Lifestyle modifications
- Population health
  - Immunizations
  - Preventative care
Medication Therapy Management Includes a Vast Array of Services

Medication Therapy Management Can Help to Improve Therapeutic Outcomes for Patients

- MTM goals
  - Effective use of drug therapy per recommended guidelines to meet treatment goals
  - Cost effective therapeutic regimen
  - Educate and empower patients
  - Improve adherence
  - Improve administration techniques (i.e. insulin, inhalers)
  - Avoid adverse drug effects, drug interactions, and therapeutic duplications
  - Decrease utilization of high risk medications
  - Improve patient safety

Less Really Is More
Older Adults Can Benefit Greatly From Medication Therapy Management

- Multiple chronic conditions
- Complex medication regimens
- Increased $$$
- MTM promotes

MTM Promotes

SAFETY
APPROPRIATENESS
COST EFFECTIVENESS

Collaborative Practice Agreements Promote Interdisciplinary Care to Improve Patient Outcomes

Collaborative Practice Agreements (CPAs) Improve Patient Outcomes

- Pharmacists develop a formal partnership with providers
  - Perform assessment
  - Counsel
  - Referrals
  - Order lab tests
  - Initiate, monitor, and adjust medication regimen
- CPAs improve health outcomes, compliance with recommended treatment guidelines, patient adherence

Collaborate Practice Agreements Can Decrease Healthcare Costs

- Decrease hospitalizations and emergency room visits
- Underserved populations can benefit due to increased accessibility to healthcare, decreased healthcare costs, and increased adherence to medications


Overall Recommendations and Conclusions
When Polypharmacy Cannot be Avoided, Close Monitoring is Crucial

• Regularly review all medications (including OTCs, supplements, etc.) especially before initiating new ones
  • Labs
  • Medical history
  • Adverse drug events and drug interactions
• Ask patients about allergies, previous adverse drug events, alcohol use, and any recreational drug use
• Identify time limits for medications intended to treat an acute condition
• Consider the strong possibility that a new symptom is an adverse effect
• Re-evaluate medication regimen if patient has a change in medical condition
• Regularly assess for necessity and effectiveness of medications
• When initiating new medications, start low and go slow
• Closely monitor high risk medications (i.e. warfarin, insulin, etc.)

Treat the Whole Patient, Not Just the Symptoms

• Individualize treatment. Every patient is unique.
• Analyze the problem rather than just symptoms
  • Avoid the prescribing cascade
• Consider age and comorbidities when choosing a medication and dose
• Ensure each medication has an appropriate indication and relevant lab work

Conclusions

• Polypharmacy is an increasing problem in older adults resulting in adverse drug events and hospitalizations
• Discontinue a medication if benefits are unclear or do not outweigh risks
• Use nonpharmacological interventions
  • The solution is not always medication
• Use tools such as Beers Criteria and STOPP/START to avoid inappropriate prescribing and improve safety in older adults
• Keep medication regimens simple to improve adherence
• Pharmacist interventions can improve therapeutic outcomes
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It is easy to get a thousand prescriptions, but hard to get one single remedy.

- Chinese Proverb