


Potentially Inappropriate Medications in the Elderly



Kasidy McKay, Pharm.D.
Jora Sliwinski, Pharm.D.

Idaho State University, Department of Family Medicine Pharmacotherapy Residents

Learning Objectives

- Define the age at which a person is considered elderly
- Describe the physiologic changes that occur with increasing age
- Recognize over-the-counter and prescription medications that may be unsafe in the elderly
- Outline the differences between the STOPP/START and Beers criteria and how each can be used to improve patient safety and outcomes

Background

- 14% of U.S. population is 65 years or older
 - Up to 30% of total prescriptions are for this age group
 - There were approximately 100,000 emergency hospitalizations for adverse drug events in U.S. adults 65 or older between 2007-2009
 - Elderly account for about half of hospitalizations due to adverse drug events
 - The percentage of elderly in the U.S. population is expected to increase (nearing 20%) in the next 10 years as the baby boomers age.

Background Continued

- Physiological changes put the elderly at increased risk of adverse events
- Guidelines exist to assist providers in prescribing medications safely in the elderly
- Potentially inappropriate medications (PIMs) can lead to adverse drug events and hospitalizations

Definitions: Elderly

- Medical definition is anyone aged 65 years and older
- “elderly”
- “geriatric”
- “seniors”



Definitions: Potentially Inappropriate Medications (PIMs)

- Inappropriate prescribing when there is a safer alternative
 - Dose too low/high
 - Use at higher frequency or duration than recommended
 - Two drugs in same class/same mechanism of action
 - Known drug-drug interaction
 - Known drug-disease state interactions
- Not prescribing a needed medications for ageist or irrational reasons

Physiological Changes that Occur with Aging

- Decreased kidney function
- Decreased muscle mass
 - Increase in adipose tissue
- Decreased liver function
 - Decrease in liver mass and blood flow
 - Decrease in liver enzyme production
- Decreased bone mass
- Decrease in serum albumin

Guidelines for Medication Use in Elderly Patients

Beers Criteria:

- Initially published by Dr. Mark Beers in 1991
 - Updates in 1997, 2002, and 2012
- For identifying potentially inappropriate medications (PIMs) in older adults
- Updated by the American Geriatrics Society
- Catalogues medications that cause adverse events in older adults due to their pharmacologic properties and the physiologic changes of aging




Guidelines for Medication Use in Elderly Patients

- START Criteria (Screening Tool to Alert doctors to Right Treatment)
 - 22 “rules” related to common prescription omissions for geriatric population
 - Alerts providers to medications that the patient should be taking based on disease states
- STOPP Criteria (Screening Tool of Older Person’s potentially inappropriate Prescriptions)
 - 65 item list regarding drug:drug interactions, drug:disease state interactions, therapeutic duplications, drugs that increase risk of cognitive deterioration
 - Alerts providers to medications that are more likely to cause adverse events in the elderly patients

Guidelines for Medication Use in Elderly Patients

- START/STOPP was created by members of the Cork University Hospital Department of Geriatric Medicine and University College Cork, School of Pharmacy in Ireland.
- START: created to assess acts of prescribing omission
- STOPP: created, in part, for use outside the U.S. Allows for more exceptions based on patient factors vs. Beer's.



Differences Between Guidelines

Beers Criteria

- No component to address medications that the patient should be taking based on disease state
- Half of listed drugs are not identified in European Drug Index
 - Beers criteria hard to apply outside of US
- May be more difficult to interpret and apply clinically compared to START/STOPP

Differences Between Guidelines

START/STOPP

- STOPP identifies **more** potentially unsafe medications than Beers
- Includes DDI and drug-disease interactions
- Designed for all clinical settings
- Addresses duplicate drug class prescriptions
- Organized according to relevant physiological systems
- Recognizes specific high risk populations
- Reflects current prescribing practice
 - Includes both American and European medications
- Provides more guidance on what's appropriate, what's not and why

*START/STOPP are typically grouped together

Drawbacks of the Guidelines

- No clear evidence to prove Beers and START/STOPP reduce morbidity, mortality or cost
- Does not replace clinical judgment
- Always look at the whole picture while considering:
 - Patient's history
 - Chronic diseases
 - Functional status
 - Prognosis (patient's life expectancy and quality of life)
 - Patient's perceptions and preferences

Technician Point of View

- Community Technician
 - Familiar with patients and their medication history and disease states
 - Sells OTC medications
- Hospital Technician
 - Prepares medications for patients on the floor
 - Can recognize doses/drugs that may not be safe in the elderly

Technicians are in a great position to "flag the pharmacist" when potential interactions are encountered or when something doesn't seem right

OTC Medications to Think About

- 1st generation anticholinergics
- NSAIDs
- Aspirin
- Cimetidine
- Proton pump inhibitors (PPI)
- Laxatives/Stool softeners
- Decongestants

1st Generation Anticholinergics

- Diphenhydramine (Benadryl®), chlorpheniramine (Chlor-Trimeton®)
- Do not use for more than 1 week
- **Increased risk of:** sedation, falls, constipation, urinary retention, worsened dementia
- Look out for combo products-especially sleep aids



Disease States to Question Use	
BPH	Constipation
Urinary retention	Fall History
Dementia	

NSAIDs

- Ibuprofen (Motrin®), Naproxen (Aleve®)
- **Increased risk of:** Stomach bleed, worsening high blood pressure, worsening heart failure



Patient Populations to Question Use	
Risk/history or stomach bleed	Poor kidney function
High blood pressure	Osteoarthritis > 3 months use
Heart failure	Long-term use for gout

Aspirin

- **Increased risk of:** stomach bleeding
- Enteric coated decreases stomach upset/damage
- If the patient has a history of stomach ulcer: use with a proton pump inhibitor or H2 blocker

Patient Populations to Question Use	
Patients taking Coumadin	Stomach ulcer history
Daily dose >150 mg	



Cimetidine

- Cimetidine (Tagamet®)
 - Has several potential drug interactions
 - Not often stocked in pharmacies
 - Alternatives are famotidine (Pepcid®) and ranitidine (Zantac®)



Patient Populations to Question Use	
With Coumadin	With Plavix
With Celebrex	Liver Impairment

Proton Pump Inhibitors (PPI's)

- Omeprazole (Prilosec®), lansoprazole (Prevacid®)
- **Increased risk of:** osteoporosis, pneumonia, *C. diff* diarrhea
 - Concerns when used at full dose for > 8 weeks
- Not indicated for long-term treatment of peptic ulcer disease or GERD



Patient Populations to Question Use	
GERD	Peptic ulcer disease
Osteoporosis	Antibiotic use

Laxatives/Stool Softeners

- Countless varieties
 - Several medications can cause constipation
- Frequent purchase of stool softeners/laxatives should be addressed
 - Chronic opioid use: patient should have a set "bowel regimen" usually docusate BID and senna daily



Patient Populations to Question Use	
Opioid pain medication	OTC antihistamine use (i.e., diphenhydramine)

Decongestants

- Pseudoephedrine (Sudafed®), Phenylephrine (Sudafed PE®)
- **Increased risk of:** insomnia, elevated blood pressure
- Considered stimulants



Disease States to Question Use	
Uncontrolled Blood Pressure	Insomnia

Patient Case:

- Mrs. Smith, 83 y/o, comes to the pharmacy counter to pick up her monthly prescriptions of warfarin 7.5mg, lisinopril 10mg, simvastatin 20mg, metformin 500mg, and ASA 81mg. She tells you that her arthritis has been “acting up” and asks if Aleve or Advil would work well for her.
- What medications are of concern for Mrs. Smith?
- When alerting your pharmacist prior to counseling, what would you point out?



Patient Case:

- Mrs. Green, 84 y/o, comes into the pharmacy to pick up her warfarin 2.5mg for atrial fibrillation. While talking with you, she tells you she just started seeing a new doctor. On her last 3 office visits, her BP has been 164/92, 186/91, and 172/94, respectively.
- According to START, would you alert your pharmacist to consult with her PCP about any HTN medications?

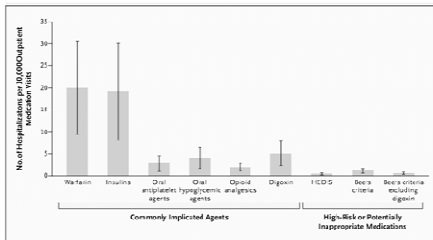


Patient Case:

- Mr. Peterson, 79 y/o, calls you at the pharmacy one morning to refill his prescriptions for pick-up later in the day. While chatting with you, he says that he is trying to get his yard ready for winter and his allergies "are the worst they've been in 10 years."
- He is requesting refills for the following:
 - Lisinopril 40mg
 - Amlodipine 10mg
 - Metoprolol Succinate 100mg
 - Hydralazine 50mg
 - HCTZ 25mg
 - Furosemide 20mg
 - He also asks if you can "throw in" a box of Claritin-D so he can finish his yard work.
- Do you agree to refill his prescriptions?
- What would you tell the pharmacist?

Inpatient/Prescription Medications to Think About

- The most common drugs that cause adverse drug events requiring hospital admission are:



N Eng J Med. 2011; 365: 2002-2012

Inpatient/Prescription Medications to Think About

- Most common:
 - Warfarin
 - Insulin (especially sliding scale)
 - Oral Antiplatelet Agents
 - Oral Hypoglycemic Agents ≠ glyburide
 - Opioid Analgesics ≠ meperidine (Demerol®)
 - Digoxin > 0.125 mg/day
- Others:
 - Spironolactone > 25 mg/day (increased risk of hyperkalemia)
 - Ketorolac: increased risk of GI bleed
 - NSAIDs: in heart failure patients

Patient Case:

- You are a hospital technician pulling medications for the morning fill and come across this label:

Patient Name: JM	Age:82
Digoxin 0.5 mg @ 0900	402B
Prescriber: Dr. John Watson	

- Should you bring this prescription order the attention of the pharmacist? Why or why not?

Patient Case:

- You are a hospital technician pulling medications for the afternoon fill and come across this label:

Patient Name: LF	Age:76
Glyburide 5 mg @ 0900 and 2100	312A
Prescriber: Dr. John Watson	

- Earlier today, you filled a stat prescription for this same patient for Dextrose 50% solution 40 ml IV because this patient was admitted with low blood sugar.
- Would you bring this prescription order to the attention of the pharmacist? Why or why not?

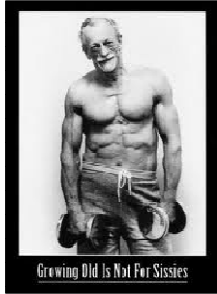
Patient Case:

- You are a hospital technician pulling medications for the afternoon fill and come across this label:

Patient Name: CP	Age:82
Diphenhydramine 25 mg every 8 hours as needed for itching	Dementia Floor 214
Prescriber: Dr. John Watson	

- Would you bring this prescription order to the attention of the pharmacist? Why or why not?

Questions



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