

Medications and the Aging Patient

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Learning Objectives

- At the end of this presentation, the participant should be able to
 - Recognize medication-related adverse effects in older adults
 - Describe the changes in older adults that affect medication use
 - Identify potentially inappropriate medications (PIMs) in older adults

Medication Use Concerns-General Population

- 1.5 million preventable adverse drug events (ADEs)/year due to medication errors (MEs)
- ~50% of all hospital-related MEs and 20% of all ADEs due to poor communication at the transitions of care
- Average hospitalized patient is subject to at least one ME per day
- ADEs account for 2.5% of estimated emergency department visits for all unintentional injuries and 6.7% of those lead to hospitalization

Medications Use Concerns-Older Adults

- Older adults comprise 14.5% of population
- Use over 30% of all prescription medications
- 90% of age ≥ 65 take at least one medication
- 40% take ≥ 5 different drugs per week; 12% take ≥ 10 /week
- Hospitalization rates are 4 times higher in elderly patients than in younger patients
- **ADEs are thought to be preventable in almost 90% of older adults** compared with only 24% in younger patients

Big Bucket: Adherence Potential Patient Reasons

- Lack of understanding
- Barriers to communications
- Complex regimen
- Differing doses
- Inconvenient scheduling
- Lack of perceived need
- Adverse drug events
- Cost
- Social isolation

Big Bucket: Adherence Medication Reconciliation

- Discrepancies between medical record and actual medication use
 - 51% taking medications not recorded in chart
 - 29% not taking a recorded medication
 - 20% taking different dosage than recorded
- The occurrence of unintended medication discrepancies at the time of hospital admission ranges from 30-70%

Big Bucket: Polypharmacy

- More chronic medical conditions = more medications
- Patient and physician's need to "do something" even for common ailments with no cure
- Doctor shopping-often for the same problem
 - Do not reveal all information at each visit
- Meds prescribed to treat side effects of other meds!
- "Save" or borrow medications
- Self-medicate

Big Bucket: Drug Interactions

- Drug-Drug-too many to list!
 - Common disease states associated with high risk of drug interactions: autoimmune, cardiovascular, gastrointestinal, infection, psychiatric disorders, respiratory, seizure disorders
 - 2 medications = 13% risk
 - 5 medications = 38% risk
 - ≥ 7 medications = 82% risk
 - Preventable drug interactions account for about 1/3 of ADEs

Big Bucket: Adverse Drug Events (ADEs)

- Unintended, unwanted, harmful, or unexpected effect of a drug
- 28% of hospitalizations in the elderly attributed to ADEs (17%) and non-adherence (11%)
- Recent study indicated four medications or medication classes were implicated alone or in combination in 2/3 of hospitalizations in elderly:
 - Warfarin (33.3%), insulin drugs (13.9%), oral antiplatelet agents (13.3%), and oral hypoglycemic agents (10.7%)
 - Almost 2/3 of hospitalizations were due to unintentional overdoses of prescribed medications (nonadherence)
- ADE risk doubles when drug use increases from 1 to 4 drugs; increases 14-fold in elders who use 7 drugs

Big Bucket: ADEs

Contributors to ADEs

- Improper drug or dosage selection
- Nonadherence to drug regimen
- Altered pharmacokinetics
- Multiple medications (polypharmacy)
- Multiple providers

Big Bucket: ADEs

ADE Risk Factors

- Advanced age (≥ 85)
- Female
- Lower socioeconomic status
- Lives alone
- Lower body weight
- H/O prior drug reactions
- Regular use of alcohol
- Prior ADE
- Recent hospitalization
- Dementia
- Hepatic or renal insufficiency
- Multiple prescribers
- Long duration of use
- Polypharmacy
- Multiple chronic diseases

Big Bucket: ADEs

ADE Pearl

Any symptom in an older adult should be considered an adverse drug event until proven otherwise!

- Fall
- GI distress
- Incontinence
- Constipation
- Depression
- Anxiety
- Confusion/delirium
- Insomnia

Big Bucket: ADEs

Prescribing Cascade

Medications prescribed to treat side effects of other medications

“As older patients move through time, often from physician to physician, they are at increasing risk of accumulating layer upon layer of drug therapy, as a reef accumulates layer upon layer of coral.” Jerry Avorn, M.D.

Big Bucket: Pharmacokinetics

- Pharmacokinetics
 - How the body affects the drug
 - Management of the drug by the body
 - Absorption, distribution, metabolism, excretion
- When the body changes (i.e., with age), drugs are managed/processed by the body differently.
- Although everyone ages differently, these changes can be considered a general guideline.



Absorption



Metabolism



Distribution



Excretion

Potentially Inappropriate Medications (PIMs)

Beers Criteria

- American Geriatrics Society 2015
- PIMs are a list of medications best avoided in older adults in general and in those with certain diseases or syndromes, prescribed at reduced dosage or with caution or carefully monitored
- PIMs = poor health outcomes, including confusion, falls, and mortality
- Avoiding PIMS = one strategy to decrease risk of ADEs
- <http://onlinelibrary.wiley.com/doi/10.1111/jgs.13702/epdf>

Beers Criteria: Tools

- Printable Pocket Card
 - http://www.ohioamda.org/pdf/AGS_2015_BEERS_Pocket-PRINTABLE.pdf

From THE AMERICAN GERIATRICS SOCIETY

A POCKET GUIDE TO THE AGS 2015 BEERS CRITERIA

This guide has been developed as a tool to assist healthcare providers in improving medication safety in older adults. The role of this guide is to inform clinical decision-making, research, training, quality measures and regulations concerning the prescribing of medications for older adults to improve safety and quality of care. It is based on The AGS 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults.

Originally conceived of in 1991 by the late Mark Beers, MD, a geriatrician, the Beers Criteria catalogues medications that cause side effects in the elderly due to the physiologic changes of aging. In 2011, the AGS sponsored its first update of the criteria, assembling a team of experts and using an enhanced, evidence-based methodology. In 2015, the AGS again funded the development of the Updated Criteria using an evidence-based methodology and rating each Criterion (quality of evidence and strength of evidence) using the American College of Physicians' Guideline Grading System, which is based on the GRADE scheme developed by Guyatt et al.

The full document, along with accompanying resources can be viewed in their entirety online at geriatriccareonline.org.

INTENDED USE

The goal of this guide is to improve care of older adults by reducing their exposure to Potentially Inappropriate Medications (PIMS).

- This should be viewed as a guideline for identifying medications for which the risks of their use in older adults outweigh the benefits.
- These criteria are not meant to be applied in a punitive manner.
- This list is not meant to supersede clinical judgment or an individual patient's values and needs. Prescribing and managing disease conditions should be individualized and involve shared decision-making.
- These criteria also underscore the importance of using a team approach to prescribing and the use of non-pharmacological approaches and of having economic and organizational incentives for this type of model.
- Two companion pieces were developed for the 2015 update. The first addresses the best way for patients, providers, and health systems to use (and not use) the 2015 AGS Beers Criteria. The second is a list of alternative medications included in the current use of High-Risk Medications in the Elderly and Potentially Harmful Drug-Disease Interactions in the Elderly quality measures. Both pieces can be found on geriatriccareonline.org.

The criteria are not applicable in all circumstances (i.e. patient's receiving palliative and hospice care). If a provider is not able to find an alternative and chooses to continue to use a drug on this list in an individual patient, designation of the medication as potentially inappropriate can serve as a reminder for close monitoring so that adverse drug effects can be incorporated into the electronic health record and prevented or detected early.

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TABLE 1. 2015 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults

Organ System, Therapeutic Category, Drug(s)	Recommendation, Rationale, Quality of Evidence (QE), Strength of Recommendation (SR)
Anticholinergics	
First-generation antihistamines: ■ Brompheniramine ■ Carbinoxamine ■ Chlorpheniramine ■ Clemastine ■ Cyproheptadine ■ Dexbrompheniramine ■ Dexchlorpheniramine ■ Dimenhydrinate ■ Diphenhydramine (oral) ■ Doxylamine ■ Hydroxyzine ■ Meclizine ■ Promethazine ■ Triprolidine	Avoid Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; risk of confusion, dry mouth, constipation, and other anticholinergic effects or toxicity Use of diphenhydramine in situations such as acute treatment of severe allergic reaction may be appropriate QE = Moderate; SR = Strong
Antiparkinsonian agents	
■ Benzotropine (oral) ■ Trihexyphenidyl	Avoid Not recommended for prevention of extrapyramidal symptoms with antipsychotics; more-effective agents available for treatment of Parkinson disease QE = Moderate; SR = Strong
Antispasmodics	
■ Atropine (excludes ophthalmic) ■ Belladonna alkaloids ■ Cidestium-Chondrorepsoid ■ Dicyclomine ■ Hyoscyamine ■ Propantheline ■ Scopolamine	Avoid Highly anticholinergic, uncertain effectiveness QE = Moderate; SR = Strong
Antiarrhythmotics	
■ Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin)	Avoid May cause orthostatic hypotension; more effective alternatives available; IV form acceptable for use in cardiac stress testing QE = Moderate; SR = Strong
■ Ticlopidine	Avoid Safer, effective alternatives available QE = Moderate; SR = Strong

CNS=central nervous system; NSAID=nonsteroidal anti-inflammatory drug; SIADH=syndrome of inappropriate antidiuretic hormone

Beers Criteria: PIMs

- Table 2
- Anticholinergics (confusion, dry mouth, constipation)
 - Diphenhydramine, meclizine, promethazine
- Alpha-1 blockers (orthostatic hypotension)
 - Prazosin, doxazosin
- Digoxin (increased risk of toxicity; max dose 0.125 mg)
- Antidepressants (highly anticholinergic, sedating, orthostatic hypotension)
 - Amitriptyline, desipramine, doxepin, nortriptyline

Beers Criteria: PIMS

- Benzodiazepines (increased sensitivity to BZDs, decreased metabolisms of long-acting agents, increase risk of cognitive impairment, delirium, falls, fractures)
 - Alprazolam, lorazepam, temazepam, diazepam, clonazepam
- Sleep agents/Nonbenzodiazepine, benzodiazepine receptor agonist hypnotics (delirium, falls, fractures; minimal efficacy)
 - Eszopiclone, zolpidem, zaleplon
- Sliding scale insulin (hypoglycemia)
- Glyburide (hypoglycemia)
- Proton pump inhibitors (Risk of *C diff* and bone loss, fractures)
 - Avoid use >8 weeks unless high risk patients or other indicated need
- NSAIDs (risk of GI bleed or PUD)
 - Avoid chronic use

Beers Criteria: PIMs due to Drug-Disease

- Table 3
- Heart failure
 - Avoid SAIDs, TZDs (fluid retention)
- Delirium
 - Avoid anticholinergics, antipsychotics, benzodiazepines, corticosteroids, H2 receptor antagonists, sedative hypnotics (avoid use in patients with high risk of delirium because of worsening delirium)
- History of falls/fractures
 - Anticonvulsants, antipsychotics, benzodiazepines, sedative hypnotics, tricyclic antidepressants

Beers Criteria: Drug Interactions

- Table 5
- Anticholinergics with other anticholinergics = increase risk of cognitive decline
- Table 7 = Anticholinergic Drugs

Pearls for Safe Medication Use

- Every drug must have clearly defined indication-minimize polypharmacy
- Accuracy in the medical record, including nonprescription and complementary medications-medication reconciliation
- Communication in transitions of care-reduce ADEs
- Patient and provider education-improve adherence and reduce ADEs
- Awareness of high risk medications (warfarin, insulin, oral hypoglycemic) and PIMs
- Recognition of ADEs in older adults