Medication Misadventures in Older Adults

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Disclosure

• This speaker has no conflict of interest to disclose but may discuss off-label use of medication.
Outline

• Medications and Preventable Hospitalizations
• 2012 American Geriatrics Society Beers Criteria
• Problematic Drug Interactions
• Case Application
MEDICATIONS AND PREVENTABLE HOSPITALIZATIONS

Did you know?

• 10.7% of hospital admissions in older adults are associated with adverse drug events (ADE)\(^1\)
• Approximately 100,000 emergency hospitalizations a year are due to ADEs\(^2\)
  – 48% of hospitalizations occur in adults 80 years of age or older
  – 66% were due to unintentional overdoses

Top Five Problematic Medication Classes leading to ED

1. Hematologic
2. Endocrine agents
3. Cardiovascular agents
4. Central Nervous System Agents
5. Anti-infective


Top Offending Medications
(67% of cases)

- Warfarin: 33.30%
- Insulins: 13.90%
- Oral Antiplatelet agents: 13.30%
- Oral Hypoglycemics: 10.70%
Inappropriate Prescribing

- Methods to Look at Inappropriate Prescribing
  e.g.:
  - Beer’s Criteria
  - STOPP (Screening Tool of Older Persons’ potentially inappropriate Prescriptions)
  - START (Screening Tool to Alert doctors to the Right Treatment)
  - Clinical Judgment

Accessed at www.biomedcentral.com/1471-2318/9/5


“If medication related problems were ranked as a disease, it would be the fifth leading cause of death in the US!”

* Beers MH. Arch Internal Med. 2003
AGS 2012 BEERS CRITERIA

Mark H Beers, MD
1954-2009

“A ballet-dancing opera critic who hiked the Alps and took up rowing after diabetes cost him his legs”

•MD, University of Vermont
•First medical student to do a geriatrics elective at Harvard’s new Division on Aging
•Geriatric Fellowship, Harvard
•Faculty, UCLA/RAND
•Co-editor, Merck Manual of Geriatrics
•Editor in Chief, Merck Manuals
Beers Criteria: History and Utilization

- Original 1991 – Nursing home pts
- Updates
  - 1997: All elderly; adopted by CMS in 1999 for nursing home regulation
  - 2003: Era of generalization to Med D, then NCQA, HEDIS
  - 2012: Further adoption into quality measures

Original Purpose

1991 Original Beers Criteria
- Evaluate inappropriate Rx used in NH residents in “common” situations, but under “certain circumstances” might be appropriate (e.g., using amitriptyline to treat pt with both Parkinson’s disease and depression)
- Clinical research on use of PIMs
- QA/QI
- Education of students, residents
Specific Aims AGS 2012 Beers Criteria

Specific aim – update 2003 Beers Criteria using a comprehensive, systematic review and grading of evidence

Strategy:
1. Incorporate new evidence
2. Grade the evidence
3. Use an interdisciplinary panel
4. Incorporate exceptions

Intent of the Criteria

Across the continuum of care where older adults reside, this criteria aims to:

1) improve the selection of prescription drugs by clinicians and patients,
2) assist with evaluating patterns of drug use,
3) educate clinicians and patients on potentially problematic medications in older adults &
4) Evaluate health outcome, quality of care, cost and other utilization data.
Beers Criteria- 3 Main Tables

1) Table 2: Medications or medication classes that *should be avoided* in persons 65 years or older

1) Table 3: Medications that should not be used in older person known to have specific medical diseases or conditions.

1) Table 4: Medications that should be used with caution

Tables 5 - 9

- Table 5 – Medications moved or modified
- Table 6 – Medications removed
- Table 7 – Medications added
- Table 8 – Antipsychotics
- Table 9 – Drugs with strong anticholinergic properties
  - Anticholinergic Risk Scale
  - Anticholinergic Drug Scale
  - Anticholinergic Burden Scale
Beers Criteria: Overall Results

- A total of **53** medications or medication classes, which are divided into three tables.
- Constructed and organized by:
  - major therapeutic classes and
  - organ systems

Beers Criteria: Table 2 Results

- 34 potentially inappropriate medications/classes to avoid in older adults independent of diagnoses or conditions.
- Notable mentions:
  - Sliding Scale Insulin
  - Antipsychotics for Behavioral Health issues associated with dementia
  - Non benzodiazepine Hypnotics
  - Megestrol
## Sliding Scale

<table>
<thead>
<tr>
<th>Organ System/Therapeutic Category/Drug(s)</th>
<th>Rationale</th>
<th>Recommendation</th>
<th>Quality of Evidence</th>
<th>Strength of Recommendation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin, sliding scale</td>
<td>Higher risk of hypoglycemia without improvement in hyperglycemia management regardless of care setting.</td>
<td>Avoid</td>
<td>Moderate</td>
<td>Strong</td>
<td>Queale 1997</td>
</tr>
</tbody>
</table>

Important to look at during transitions in care due to the fact that PO Diabetes meds are stopped when they are admitted and typically have insulin protocols in place.

## Antipsychotics

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Antipsychotics, first- (conventional) and second- (atypical) generation (see Table 8 for full list)</td>
<td>Increased risk of cerebrovascular accident (stroke) and mortality in persons with dementia.</td>
<td>Avoid use for behavioral problems of dementia unless non-pharmacologic options have failed and patient is threat to self or others.</td>
<td>Moderate</td>
<td>Strong</td>
<td>Dore 2009 Mahler 2011 Schneider 2005 Schneider 2006a Schneider 2006b Vigen 2011</td>
</tr>
</tbody>
</table>

Timely addition with the increased focus on safety and efficacy in patients on these medications especially within the nursing home setting.
## Non Benzodiazepine Hypnotics

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<thead>
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<tbody>
<tr>
<td>Nonbenzodiazepine hypnotics</td>
<td>Benzodiazepine-receptor agonists that have adverse events similar to those of benzodiazepines in older adults (e.g., delirium, falls, fractures); minimal improvement in sleep latency and duration.</td>
<td>Avoid chronic use (&gt;90 days)</td>
<td>Moderate</td>
<td>Strong</td>
<td>Allain 2005, Cotroneo 2007, Finkle 2011, McCrae 2007, Orriols 2011, Rhalimi 2009</td>
</tr>
<tr>
<td>Eszopiclone</td>
<td></td>
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<tr>
<td>Zolpidem</td>
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<tr>
<td>Zaleplon</td>
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## Megestrol

<table>
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<tr>
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</table>
### Beers Criteria: Table 3 Notable Mentions

<table>
<thead>
<tr>
<th>Disease/Syndrome</th>
<th>Drug/Drug Class</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>NSAIDs and COX-2 inhibitors Non-dihydropyridine CCBs (avoid only for systolic heart failure)</td>
<td>Potential to promote fluid retention and/or exacerbate heart failure</td>
</tr>
<tr>
<td></td>
<td>• Diltiazem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Verapamil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pioglitazone, rosiglitazone, Cilostazol Dronedarone</td>
<td></td>
</tr>
<tr>
<td>Syncope</td>
<td>Acetylcholinesterase inhibitors (CEIs) Peripheral alpha blockers Tertiary TCAs Chlorpromazine, thioridazine, and olanzapine</td>
<td>Increases risk of orthostatic hypotension or bradycardia</td>
</tr>
</tbody>
</table>

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<table>
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<th>Disease/Syndrome</th>
<th>Drug/Drug Class</th>
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</tr>
</thead>
<tbody>
<tr>
<td>History of falls or fractures</td>
<td>Anticonvulsants Antipsychotics Benzodiazepines Nonbenzodiazepine hypnotics • Eszopiclone • Zaleplon • Zolpidem TCAs and Selective serotonin reuptake inhibitors.</td>
<td>Ability to produce ataxia, impaired psychomotor function, syncope, and additional falls; shorter-acting benzodiazepines are not safer than long-acting ones</td>
</tr>
<tr>
<td>Delirium</td>
<td>All TCAs Anticholinergics Benzodiazepines</td>
<td>Avoid in older adults with or at high risk of delirium because of inducing or worsening delirium in older adults; if discontinuing drugs used chronically, taper to avoid withdrawal symptoms.</td>
</tr>
<tr>
<td></td>
<td>Chlorpromazine Corticosteroids H₂ receptor antagonists. Meperidine Sedative hypnotics Thioridazine</td>
<td></td>
</tr>
</tbody>
</table>
Beers Criteria: Table 4 Notable Mentions

<table>
<thead>
<tr>
<th>Drug</th>
<th>Rationale</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA for Primary Prevention of</td>
<td>Limited data in individuals &gt; 80</td>
<td>Use with caution in adults &gt; 80</td>
</tr>
<tr>
<td>cardiac events</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>May exacerbate or cause SIADH or hyponatremia; need to monitor sodium level closely when starting or changing dosages in older adults due to increased risk</td>
<td>Use with caution</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td></td>
<td></td>
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<tr>
<td>Carboplatin</td>
<td></td>
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<tr>
<td>Chlorpropamide</td>
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<td></td>
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<tr>
<td>Cisplatin</td>
<td></td>
<td></td>
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<tr>
<td>Mirtazapine</td>
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<td></td>
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<tr>
<td>SNRIs</td>
<td></td>
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<tr>
<td>SSRIs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCAs</td>
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<tr>
<td>Vincristine</td>
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</tbody>
</table>

Limitations

- Older adults often under-represented in drug trials potentially underestimating medication related problems/evidence grading.
- Does not comprehensively address the needs of palliative and hospice care patients
- Does not address other types of potential potentially inappropriate medications
  - e.g.:
    - dosing of primarily renally eliminated medications,
    - drug-drug- interactions
Beers Criteria only Part of Quality Prescribing

**Quality prescribing includes:**

- Correct drug for correct diagnosis
- Appropriate dose (label; dose adjustments for co-morbidity, drug-drug interactions)
- Avoiding underuse of potentially important medications (e.g., bisphosphonates for osteoporosis)
- Avoiding overuse (e.g., antibiotics)
- Avoiding potentially inappropriate drugs
- Avoiding withdrawal effects with discontinuation
- Consideration of cost

Resources Available Online

[www.americangeriatrics.org](http://www.americangeriatrics.org)

For the Health Professional

- Downloadable or laminated pocket card
- Online Evidence tables
- Smartphone application (iGeriatrics)

For the Layperson

- Summary in lay language
- Q & A on what to do if one of your drugs is on the Beers list
- Medication diary & tips for safe use of meds
Drug Interactions

- Prevalence of potential drug interactions is not known but estimates of significant D-D interactions range from 4-13%
- Additional work needs to be done to look at clinically significant drug interactions especially in older adults
- Existing resources are out that from organizations such as AMDA and CMS relevant to older adults
Clinically Relevant Drug Interactions

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Interacting Agent</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitors/ARBs</td>
<td>Potassium sparing diuretic</td>
<td>Increased risk of hyperkalemia/hospitalization</td>
</tr>
<tr>
<td>Calcium Channel Blockers</td>
<td>Macrolide antibiotics</td>
<td>Increased risk of hypotension/shock/hospitalization</td>
</tr>
<tr>
<td>Digoxin</td>
<td>Macrolide antibiotics</td>
<td>Increased risk for digoxin toxicity/hospitalization</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>SMX/SMP</td>
<td>Increased risk of phenytoin toxicity</td>
</tr>
<tr>
<td>Warfarin</td>
<td>NSAIDs, antimicrobials</td>
<td>Increased risk for GI bleeding</td>
</tr>
</tbody>
</table>


Case Scenario

NK is an 89 yr old woman admitted to the nursing home within the last 2 months. The facility staff are contacting you because they need you to address her “sundowning.”

PMH:
- Osteoporosis
- Hypertension
- Alzheimer’s Disease for 6 years
Case Continues

• **SH:** Lived with her husband in their apartment within the retirement community for 8 years but moved to the nursing home after a recent hospitalization for a urinary tract infection. Per the history from the husband, he was unable to handle her due to her agitation with him.

• **Functional Capacity:**
  – Dependent in toileting, dressing and bathing
  – Now wheelchair dependent
  – Of note, been falling more and staff notes she is especially drowsy in the morning with breakfast

Case Continues

• **Medications:**
  – Olanzapine (Zyprexa) 5mg at bedtime for dementia related behaviors
  – Lorazepam (Ativan) 0.5mg twice daily for anxiety
  – Citalopram (Celexa) 20mg daily for depression/irritability
  – Enteric Coated Aspirin 81mg daily for heart health
  – Calcium 600mg/Vitamin D 400IU 1 tablet daily for bone health
  – Lisinopril 10mg in the morning for hypertension
  – Rivastigmine (Exelon) 6mg twice daily for Alzheimer’s Disease
  – Memantine (Namenda) 10mg twice daily for Alzheimer’s Disease
Pertinent information:
- BP = 120/74 sitting  HR = 72 bpm
- Ht = 5’2”  Wt = 50 kg
- Estimated CrCl = 32 ml/min
- UA: negative
- CBC and BMP: WNL

What do you do?

Coordinated Medication Management

Patient understands his/her medications and participates in a care plan to improve health

Clinical Pharmacist

Appropriate, Effective, Safe and Adherent Medication Use!

Optimal therapeutic recommendations are based on the experience/needs of the patient

Physicians/PA’s/ANP’s

Nurses/Social Workers

Family members/Aides

Gaps in clinical goals are determined, drug therapy problems identified, and therapeutic recommendations made

Clinical goals of therapy are determined and medication recommendations are considered
Take Home Points

• Polypharmacy, medication misadventures as well as safety concerns continue to be a growing problem for older adults.
• We all must be vigilant to monitor patients on an ongoing basis to minimize negative outcomes.
• Explicit Criteria such as the Beers List helps with this public awareness.

References