Implementation of BEER’s and Other Polypharmacy Tools in Optimizing Medication Use in Geriatric Patients

ANGELA M. HILL, PHARM.D., CPH

PROFESSOR & CHAIR, DEPT. OF PHARMACOTHERAPEUTICS AND CLINICAL RESEARCH
Learning Objectives:

- Compare and contrast the tools used for medication use criteria in addressing polypharmacy management.
- Analyze appropriate polypharmacy tools for minimizing the inappropriate use of medications in various clinical settings.
- Apply strategies to identify and resolve medication related problems.
- Demonstrate the ability to recognize inappropriate medication use in the aging population, and provide recommendations to ensure therapeutic optimization through case discussions.
Medication use in Geriatric Patients

- 20% of patients >65 years of age take at least 10 medications.

- A survey in the United States of a representative sampling of 2206 community-dwelling adults (aged 62 through 85 years) was conducted by in-home interviews and use of medication logs between 2010 and 2011. At least one prescription medication was used by 87 percent. Five or more prescription medications were used by 36 percent, and 38 percent used over-the-counter medications.

Medication use in Geriatric Patients

- In a sample of Medicare beneficiaries discharged from an acute hospitalization to a skilled nursing facility, patients were prescribed an average of 14 medications, including over one-third with side effects that could exacerbate underlying geriatric syndromes.

- Use of herbal or dietary supplements (e.g., ginseng, ginkgo biloba extract, and glucosamine) by older adults has been increasing, from 14 percent in 1998 to 63 percent in 2010. One study in over 3000 ambulatory adults 75 years of age or older in four states in the United States found that almost three-quarters used at least one prescription drug and one dietary supplement.

Reasons for Polypharmacy Epidemic

- Prescribing Cascade
- Off-Label Use of Medications
- Multiple Prescribers
- Overuse of Vitamins
- Overuse of Herbals
Strategies for Managing Polypharmacy

- Check medication administration timing
- Check for potential drug interactions
- Identify duplication of therapy
  - Vitamins
  - Nonprescription vs prescription
  - Herbals vs prescription
- Check doses of each medication and modify accordingly
- Perform side effect queries
- Identify cognitive-impacting medications
- Identify fall-risk medications
- Identify swallowing-risk medications
- Replace problematic medication with alternative medication
- Discontinue medication (deprescribe)
What categories of medications are inappropriate for geriatric patients? ...and why?
Geriatric Syndromes

- Falls
- Hearing Impairment
- Incontinence
- Cognitive Impairment
- Low Body Index
- Vision Impairment
- Dizziness
Case

- Name: Jean Smith  
  Age: 82  
  Drug Allergies: Penicillin – hives/rash, sulfa – itching

- Current weight: 155 pounds  
  Height: 5'2"

- BP: 165/73

- DOB: 6/6/31

- Primary Physician: Dr. Patel  
  Phone: 555-1234

- Pharmacy: Downtown pharmacy  
  Phone: 555-4321

- PMH: HTN, Alzheimer’s dementia, macular degeneration, urinary incontinence, LE edema
Case

- **SH:** Lives alone in independent living. No alcohol, no smoking, but uses medical marijuana. She has help with putting her medications in a pillbox, however often takes extra supplements. She has a caregiver who helps her shower and dress in the morning and reminds her to take her pills. She lost her oldest son and last living sibling this past year. She stopped driving last year also because she got into four MVAs. She is a retired teacher.

- **FH:** Her family history is significant for cerebrovascular disease (father died at age 69), heart attacks (mother 45, grandmother 64), dementia (mother, maternal grandmother), cancer, and Parkinson’s disease (paternal grandfather).
Mrs. Smith reports that she always feels tired, and is always going to the bathroom. Her husband feels she is more confused than usual, and wonders if her medications are working. He says she is spending a couple of hundred a month on her medications, and doesn’t feel that they are getting their money’s worth.
<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atenolol</td>
<td>25mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Furosemide</td>
<td>20mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Potassium</td>
<td>10mEq</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Diltiazem XT</td>
<td>240mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>5mg</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Namenda</td>
<td>5mg</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Ambien</td>
<td>10mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Centrum Silver MVI</td>
<td>1 tab</td>
<td>Once a day</td>
</tr>
<tr>
<td>Occuvite 50+</td>
<td>1 tab</td>
<td>Once a day</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>400mcg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>1000mcg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>1000mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Divalproex</td>
<td>250mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Calcium + Vit D</td>
<td>600mg/400IU</td>
<td>Once a day</td>
</tr>
<tr>
<td>Aricept</td>
<td>5 mg</td>
<td>Once a day</td>
</tr>
</tbody>
</table>
Which medication(s) are inappropriate for this patient?

Go to: www.todaysmeet.com/MedTools
Don’t forget!

- Falls
- Hearing Impairment
- Incontinence
- Cognitive Impairment
- Low Body Index
- Vision Impairment
- Dizziness
Criteria for Identifying inappropriate medications

Implicit Criteria
- Require clinical judgement

Explicit Criteria
- Based on presence of drugs or disease
Tools for Identifying Inappropriate Medications

- BEER’s Criteria
- STOPP/START
- PRISCUS
- Medication Appropriateness Index
- IPET (Canadian Criteria)
- FIT for the Aged Criteria
- Prescribing Indicators in Elderly Australians
## Explicit Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Year of Development</th>
<th>Country of Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEERS</td>
<td>1991</td>
<td>United States</td>
</tr>
<tr>
<td>START/STOPP</td>
<td>2008</td>
<td>Ireland</td>
</tr>
<tr>
<td>PIEA</td>
<td>2008</td>
<td>Australia</td>
</tr>
</tbody>
</table>
Let’s Take a Look....

- https://www.guideline.gov/summaries/summary/49933

- http://ngna.org/_resources/documentation/chapter/carolina_mountain/STARTandSTOPP.pdf
Questions

- Which criteria would you prefer to use?
- Why?
- What differences did you discover between the two criteria?
The BEERs Criteria

- Originally conceived by Mark Beers, MD (geriatrician)


- First criteria designed to identify inappropriate medications in the elderly
Limitations to BEERS Criteria

• Poorly organized
• Not applicable outside of the United States
• Many of the medications are no longer available
• Includes drugs that are effective and arguably still have a role in treating the elderly, despite adverse effect concerns
• Focus on drugs in criteria diverts attention from other drugs that may pose serious risks and require cautious prescribing
• Absence of medications that have been independently associated with increased risk in the elderly
Limitations to BEERS Criteria

- Prescribing omissions are not addressed
- Limited number of drug-drug interactions are included
- Drug duplication from same drug class are not included
- Certain clinically important drug-disease interactions are omitted
- Have not been validated in hospitalized patients
STOPP/START CRITERIA

START:
- Divided into 6 prescribing omission categories
- Divided according to physiologic systems, including cardiovascular, respiratory, and central nervous systems

STOPP:
- Broad in clinical scope
- Emphasis is on drug interactions
Advantages of STOPP/START Criteria

- Has been studied in various patient-care settings
- STOPP indicators have been found to be more sensitive than BEERS criteria in the inpatient setting, skilled nursing, and community settings
- STOPP indicators seem to be clinically up-to-date
- Have defined their role in identifying and preventing inappropriate prescribing in older adults
Limitations to STOPP/START Criteria

- References are mostly to primary and tertiary sources; however, a few citations are to the British National Formulary.
- STOPP criteria do not include drugs that other experts might argue are high risk.
## Comparison of Prescribing Criteria

<table>
<thead>
<tr>
<th>Medication or Medication Class</th>
<th>BEERS</th>
<th>PIES</th>
<th>STOPP/START</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially Inappropriate Medication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpha Blockers</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calcium Channel Blockers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Digoxin</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warfarin</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Glibenclamide</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Theophylline</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>NSAIDS</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
### Comparison of Prescribing Criteria

Curtain, Drugs Aging 2013;30:935-943

<table>
<thead>
<tr>
<th>Medication or Medication Class</th>
<th>BEERS</th>
<th>PIEA</th>
<th>STOPP/START</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially Inappropriate Medication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estrogens</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PPIs</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Prochlorperazine</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
### Comparison of Prescribing Criteria

*Curtain, Drugs Aging 2013;30:935-943*

<table>
<thead>
<tr>
<th>Medication or Medication Class</th>
<th>BEERS</th>
<th>PIEA</th>
<th>STOPP/START</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially Prescribing Omission</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ACEIs or ARBS</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Antiplatelets</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Beta Blockers</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calcium and/or Vitamin D</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Statins</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Warfarin</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Limitations of Both Criteria

- Non-prescription medications are not emphasized in the criteria
- Herbal medications are not mentioned in the criteria
- Recommendations from therapeutic guidelines are not comprehensively incorporated into the criteria
## Case Example:

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atenolol</td>
<td>25mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Furosemide</td>
<td>20mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Potassium</td>
<td>10mEq</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Diliazem XT</td>
<td>240mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>5mg</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Namenda</td>
<td>5mg</td>
<td>Twice a day</td>
</tr>
<tr>
<td>Ambien</td>
<td>10mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Centrum Silver MVI</td>
<td>1 tab</td>
<td>Once a day</td>
</tr>
<tr>
<td>Occuvite 50+</td>
<td>1 tab</td>
<td>Once a day</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>400mcg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>1000mcg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>1000mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Divalproex</td>
<td>250mg</td>
<td>Once a day</td>
</tr>
<tr>
<td>Calcium + Vit D</td>
<td>600mg/400IU</td>
<td>Once a day</td>
</tr>
<tr>
<td>Aricept</td>
<td>5 mg</td>
<td>Once a day</td>
</tr>
</tbody>
</table>
Tools for Managing Polypharmacy

- Good Palliative-Geriatric Algorithm
- Geriatric Risk Assessment Guide
- Prescribing Optimization Method
- Anticholinergic Risk Scale
- Drug Burden Index
- Priscus List
Priscus List

- German version of STOPP/START and BEERS
- Provides info on inappropriate meds, provides therapeutic alternatives, and lists concerns
- Includes 83 medications from 18 categories
- Not updated

https://www.aerzteblatt.de/pdf/DI/107/31/m543.pdf
Tools for Nursing Home Patients

- The Assess, Review, Minimize, Optimize, Reassess Tool
- The Good Palliative-Geriatric Practice Algorithm
- Patient-Focused Drug Surveillance
- Geriatric Risk Assessment Medguide
Identify the Inappropriate Medications in this Patient’s Regimen?

clopidogrel (PLAVIX) 75 mg tablet take one tablet daily

diclofenac sodium 1% Gel apply to affected area four times daily
diphenhydramine 25mg take one tablet daily

escitalopram oxalate (LEXAPRO) 5 mg tablet take one tablet daily

isosorbide mononitrate (ISMO,MONOKET) 10 mg tablet take one tablet daily

mirabegron (MYRBETRIQ) 25 mg Tb24 take one tablet daily

mirtazapine (REMERON) 15 mg tablet take one tablet daily

prednisone (DELTASONE) 20 mg tablet take one tablet daily

rivastigmine (EXELON) 9.5 mg/24 hr apply daily

Ubidecarenone (COQ-10 ORAL) take one tablet daily

vitamin B complex tablet take one tablet daily
Tools for Minimizing Anticholinergic burden

- Anticholinergic Risk Scale
- Drug Burden Index
<table>
<thead>
<tr>
<th>3 Points</th>
<th>2 Points</th>
<th>1 Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline hydrochloride</td>
<td>Amantadine hydrochloride</td>
<td>Carbidopa-levodopa</td>
</tr>
<tr>
<td>Atropine products</td>
<td>Baclofen</td>
<td>Entacapone</td>
</tr>
<tr>
<td>Banzopine mesylate</td>
<td>Cotrimoxazole hydrochloride</td>
<td>Haloperidol</td>
</tr>
<tr>
<td>Carliprodol</td>
<td>Clemadine</td>
<td>Methocarbamol</td>
</tr>
<tr>
<td>Chlorpheniramine maleate</td>
<td>Clozapine</td>
<td>Metoclopramide hydrochloride</td>
</tr>
<tr>
<td>Chlorpromazine hydrochloride</td>
<td>Cyclobenzaprine hydrochloride</td>
<td>Mirtazapine</td>
</tr>
<tr>
<td>Cyproheptadine hydrochloride</td>
<td>Desipramine</td>
<td>Paroxetine</td>
</tr>
<tr>
<td>Dicyclomine hydrochloride</td>
<td>Loperamide hydrochloride</td>
<td>Pramipexole</td>
</tr>
<tr>
<td>Diphenhydramine hydrochloride</td>
<td>Loratadine</td>
<td>Quetiapine fumarate</td>
</tr>
<tr>
<td>Fluphenazine hydrochloride</td>
<td>Nortriptyline hydrochloride</td>
<td>Ranitidine hydrochloride</td>
</tr>
<tr>
<td>Hydroxyzine hydrochloride and hydroxyzine pamoate</td>
<td>Olanzapine</td>
<td>Risperidone</td>
</tr>
<tr>
<td>Hyoscyamine products</td>
<td>Prochlorperazine maleate</td>
<td>Selagiline hydrochloride</td>
</tr>
<tr>
<td>Imipramine hydrochloride</td>
<td>Pseudoephedrine hydrochloride-triprolidine hydrochloride</td>
<td>Trazodone hydrochloride</td>
</tr>
<tr>
<td>Meclizine hydrochloride</td>
<td>Tolterodine tartrate</td>
<td>Ziprasidone hydrochloride</td>
</tr>
<tr>
<td>Oxybutynin chloride</td>
<td>Parphenazine</td>
<td></td>
</tr>
<tr>
<td>Promethazine hydrochloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoridazine hydrochloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trihexyline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tizanidine hydrochloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trifluoperazine hydrochloride</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To calculate the Anticholinergic Risk Scale score for a patient, identify medications the patient is taking and add the total points for each medication.*
Calculate the Anticholinergic Burden:

Go to: [www.todaysmeet.com/MedTools](http://www.todaysmeet.com/MedTools)

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>clopidogrel (PLAVIX)</td>
<td>75 mg tablet</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>diclofenac sodium 1 % Gel</td>
<td>apply to affected area</td>
<td>four times daily</td>
</tr>
<tr>
<td>diphenhydramine</td>
<td>25mg</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>escitalopram oxalate (LEXAPRO)</td>
<td>5 mg tablet</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>isosorbide mononitrate (ISMO,MONOKET)</td>
<td>10 mg tablet</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>mirabegron (MYRBETRIQ)</td>
<td>25 mg Tb24</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>mirtazapine (REMERON)</td>
<td>15 mg tablet</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>prednisone (DELTASONE)</td>
<td>20 mg tablet</td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>rivastigmine (EXELON)</td>
<td>9.5 mg/24 hr</td>
<td>apply daily</td>
</tr>
<tr>
<td>Ubidecarenone (COQ-10 ORAL)</td>
<td></td>
<td>take one tablet daily</td>
</tr>
<tr>
<td>vitamin B complex tablet</td>
<td></td>
<td>take one tablet daily</td>
</tr>
</tbody>
</table>
## Likelihood of anticholinergic adverse effects

<table>
<thead>
<tr>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline, atropine, benztropine, chlorpheniramine, chlorpromazine, cyclizine, hyoscine (all formulations), imipramine, oxybutynin, promethazine, thioridazine</td>
<td>Baclofen, cetirizine, desipramine, loperamide, loratadine, nortriptyline, olanzapine, prochlorperazine</td>
<td>Captopril, carbidopa-levodopa, clonazepam, codeine, dexamethasone, diazepam, digoxin, diltiazem, dipyridamole, fentanyl, furosemide, haloperidol, Isosorbide, mononitrate, lorazepam, methylprednisolone, metoclopramide, morphine, oxazepam, oxycodeone, paroxetine, prednisone, pramipexole, quetiapine, ranitidine, risperidone, seligiline, temazepam, tramadol, warfarin</td>
</tr>
</tbody>
</table>
Anticholinergic Medication Use in the Elderly

In nursing home patients
- 21-32% take ≥ 2 anticholinergics
- 10-17% take ≥ 3 anticholinergics
- 5% take ≥ 5 anticholinergics

Fienberg M. Drugs Aging. 1993;3:335-348
The Use of Anticholinergic Medications is Associated with Clinical Decline in Cognitively Normal Older Adults*

AC – No AC medications
AC + 1+ medications with medium or high AC activity

*Mean age 73 yrs

Modified from: Rechberger SL et al JAMA Neurol 2016;73(8):721-732

A

<table>
<thead>
<tr>
<th>Mean Bilateral Cortical Volume (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>426</td>
</tr>
<tr>
<td>424</td>
</tr>
<tr>
<td>422</td>
</tr>
<tr>
<td>420</td>
</tr>
<tr>
<td>418</td>
</tr>
<tr>
<td>416</td>
</tr>
<tr>
<td>414</td>
</tr>
<tr>
<td>412</td>
</tr>
<tr>
<td>410</td>
</tr>
</tbody>
</table>

P=0.02

AC– Patients (n=251)  AC+ Patients (n=35)

B

<table>
<thead>
<tr>
<th>% Remaining Cognitively Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

P=0.01

Time of Conversion to Mild Cognitive Impairment or Alzheimer Disease (Years)

(n=333)  (n=51)
What Medication(s) are Inappropriate for This Patient?
Go to: www.todaysmeet.com/MedTools

- A 92 y.o. male who has dementia is reportedly staying up all night, and sundowning. He is taken to the emergency room because he got belligerent with his caretaker. He is using the Exelon patch, and takes Namenda, metformin, amlodipine, and furosemide. He is prescribed trazodone 50mg QID for sleep.
What Medication(s) are Inappropriate for This Patient?

Go to: www.todaysmeet.com/MedTools

An 87 y.o. female who has severe COPD is reportedly not sleeping despite the use of Ambien, lorazepam, Percocet, and mirtazapine. She uses oxygen and takes Senna, losartan, metoprolol, aspirin, lovastatin, and a multivitamin.
Categories of Medications that are Inappropriate for the Geriatric Patient

- Anticholinergics
- Antispasmodics
- Analgesics
- Sedative Hypnotics
- Amphetamines
- Anorexogenics
- Antihypertensives
Now that you have identified the inappropriate medication......
The Art of Deprescribing
Strategies for Deprescribing

- Reframe the issue with patient and prescriber
- Discuss the benefit-harm-trade offs and assess willingness
- Target patients according to highest ADE risk
- Target drugs more likely to be non-beneficial
- Access and apply specific discontinuation regimens
- Foster shared education and training
- Extend the time frame with the same clinician

Ideal Patients for Deprescribing

- Aging patients
- Patients taking more than 5 prescription and nonprescription medications
- Institutionalized patients
- Patients at the end of life
- Others
Ideal Opportunities for Deprescribing

- MTM sessions
- Monthly chart reviews in the nursing home setting
- Transition of Care
- Discharge Counseling from a hospital, rehab center, mental health facilities
- Admission into hospice
- Therapeutic Optimization
- Medicare Annual Wellness Visits
- Other.....
Considerations for Deprescribing

- Calculate Life Expectancy

- Use Disease Risk Protocols
  [http://www.medal.org](http://www.medal.org)

- Use Prognostic Tools
  [http://eprognosis.ucsf.edu](http://eprognosis.ucsf.edu)

- Determine utility of medication
Five-Step Deprescribing Process

Reeve et al., BJCP, 2014;78:4;738-747.
CEASE Deprescribing Framework

- **Current Medication Analysis** (medication reconciliation)
- **Elevated Risk** medication Identification
  - Consider risk factors such as number of meds, age, adherence patterns, use of high risk drugs, multiple prescribers, cognitive status, substance use, mental health problems
- **Assess** usefulness of each medication
  - Confirm indication based on diagnoses, evaluate effects of med on disease state, determine future benefit of medication
- **Sort** or prioritize deprescribing meds with lowest utility
- **Eliminate** or implement a discontinuation regimen that includes monitoring

Scott, IMJ, 2015;45:352-355
Good Palliative-Geriatric Practice Algorithm

Discuss the following with the patient/guardian

- An evidence-based consensus exists for using the drug for the indication given in its current dosing rate in this patient's age group and disability level, and the benefit outweighs all possible known adverse effects
  - No/Not sure
    - Indication seems valid and relevant in this patient's age group and disability level
      - Yes
        - Do the known possible adverse reactions of the drug outweigh possible benefit in old, disabled patients?
          - Yes
            - STOP DRUG
          - No
            - Any adverse symptoms or signs that may be related to the drug?
              - Yes
                - SHIFT TO ANOTHER DRUG
              - No
                - Is there another drug that may be superior to the one in question?
                  - Yes
                    - Shift to another drug
                  - No
                    - Can the dosing rate be reduced with no significant risk?
                      - Yes
                        - Reduce dose
                      - No
                        - Continue with the same dosing rate
Target Medications for Deprescribing

- Duplicate medications
- Proton Pump Inhibitors/H2A
- Polypharmacy regimens for specific disease
- Nonprescription and Herbal Medications
- Psychotropics
Reasons Why Deprescribing Psychotropic Medications is Necessary

- Minimize ADRs
- Minimize cost to patient
- Improve adherence
- Simplify regimens
- Minimize polypharmacy
- Minimize hospitalizations
- Other....

- Psychiatric emergencies
  - Neuroleptic Malignant Syndrome
  - Agranulocytosis from Clozapine or Remeron
  - Seizures from Bupropion
  - Serotonin Syndrome
  - Hypertensive Crisis
  - EPS/Tardive Dyskinesia/Dystonias
Realities for Using Psychotropic Medications

- Titration
- Pharmacodynamic Nuances of Psychotropic Medications
- Monitor
- Tapering
- Augmentation
- Black Box Warnings
- Syndromes
- Off-Label Use
Benefits of Titrating and Tapering

- Titrating allows you to treat at the minimum effective dose while minimizing side effects.
- Tapering minimizes rebound of symptoms or withdrawal.
## CNS Medications Associated with Discontinuation Syndromes

<table>
<thead>
<tr>
<th>Medication</th>
<th>Withdrawal</th>
<th>Rebound</th>
<th>Disease Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticonvulsants</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baclofen</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Antiparkisonian</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Strategies for Tapering Benzodiazepines

- Decrease dose by 25-50% initially, then gradually decrease dose by 25% every 1-2 weeks.

- Establish a taper period based on length of use, and decrease dose by 25-50% incrementally until complete.

- Transition medication to klonopin and taper by 25-50% over 1-2 weeks.
Benzodiazepine Withdrawals

- Seizures
- Headache
- Increased Sensitivity To Noise
- Sweating
- Difficulty Falling Asleep
- Pain
- Weight Loss
- Shaking
- Blurred Vision
- Increased Sensitivity To Light
- Depression
- Difficulty Staying Asleep
- Nervousness
General Rules about Tapering

- Use >2-4 weeks for most classes (except benzodiazepines)

- Cross-titrate when possible, but monitor for “syndromes”
Antidepressant Life-Threatening Effects

Antidepressant abuse can cause a number of effects that are potentially severe.

- Vomiting
- Insomnia
- Headache
- Weight gain
- Dry mouth
- Tremors
- Dizziness
- Decreased libido
# Psychiatric Syndromes

**ALTERED MENTAL STATUS + ELEVATED TEMPERATURE**
*In addition to sepsis, consider the following (culprit is often polypharmacy)*

<table>
<thead>
<tr>
<th>SYNDROME</th>
<th>EXPOSURE</th>
<th>MUSCLE TONE</th>
<th>MUCOSA &amp; SKIN</th>
<th>PUPILS</th>
<th>BOWEL SOUNDS</th>
<th>REFLEXES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUROLEPTIC MALIGNANT SYNDROME</td>
<td>ANTIPSYCHOTICS</td>
<td>RIGID</td>
<td>WET</td>
<td>NORMAL</td>
<td></td>
<td>BRADYREFLEXIA</td>
</tr>
<tr>
<td>SEROTONIN SYNDROME</td>
<td>SEROTONERGICS (antidepressants, fentanyl, linezolid, sumatriptan, ondansetron)</td>
<td>RIGID</td>
<td>WET</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTICHOLINERGIC TOXIDROME</td>
<td>ANTICHOLINERGICS</td>
<td>NORMAL</td>
<td>DRY</td>
<td></td>
<td></td>
<td>NORMAL</td>
</tr>
<tr>
<td>MALIGNANT HYPERThERMIA</td>
<td>INHALLED ANESTHETICS SUCCINYLCHOLINE</td>
<td>RIGID</td>
<td>WET</td>
<td>NORMAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Serotonin Syndrome

- Mental status changes
  - Confusion
  - Agitation
  - Lethargy
  - Coma

- Autonomic instability
  - Hyperthermia
  - Tachycardia
  - Mydriasis
  - Diaphoresis
  - Nausea & vomiting
  - Diarrhea

- Neuromuscular hyperactivity
  - Hyperkinesia
  - Hyperreflexia
  - Trismus
  - Mydriasis
  - Cogwheel rigidity

- Causes
  - SSRI
  - Lithium
  - Memantine
  - Tricyclics
  - MAOI
  - Cocaine
  - SSRI + MAOI = Risk

Similar to anticholinergic OD. However, this has Diaphoresis, Nausea, and Vomiting. I'm dry as a bone and she's hot and wet!

My medication was increased 6 hours ago:

- Hyperreflexia
- Bruxism (grinding teeth)

Cogwheel rigidity

Tachycardia

Treatment:
- Cyproheptadine
- 5-HT₁a
- 5-HT₂a Agonism

Osmol in 6 hours

Pass in days
Clinical Implications of Blockade of Various Receptors by Antipsychotics

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Possible Benefit</th>
<th>Possible Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dopamine D2</td>
<td>Antipsychotic Effect</td>
<td>EPS, dystonia, parkinsonism, akathisia, tardive dyskinesia, prolactin elevation, galactorrhea, gynecomastia, menstrual changes, sexual dysfunction</td>
</tr>
<tr>
<td>Serotonin 5HT2A</td>
<td>Reduced EPS</td>
<td>Sexual disturbances</td>
</tr>
<tr>
<td>Serotonin 5HT2C</td>
<td>Not known</td>
<td>Weight gain</td>
</tr>
<tr>
<td>Histamine H1</td>
<td>Not known</td>
<td>Sedation, increased appetite, weight gain, hypotension</td>
</tr>
<tr>
<td>Muscarinic</td>
<td>Reduced EPS</td>
<td>Blurred vision, dry mouth, constipation, urinary retention, sinus tachycardia, memory dysfunction</td>
</tr>
<tr>
<td>Alpha-1 blockade</td>
<td>Not known</td>
<td>Postural hypotension, dizziness, reflex tachycardia</td>
</tr>
</tbody>
</table>
### CV Medications Associated with Discontinuation Syndromes

<table>
<thead>
<tr>
<th>Medication</th>
<th>Withdrawal</th>
<th>Rebound</th>
<th>Disease Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha-Blockers</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>ACE-Inhibitors</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Antianginal Agents</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digoxin</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Diuretics</td>
<td></td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>
Other Medications Associated with Discontinuation Syndromes

<table>
<thead>
<tr>
<th>Medication</th>
<th>Withdrawal</th>
<th>Rebound</th>
<th>Disease Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narcotic Analgesics</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSAIDS</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>
What Deprescribing Practices Would You Implement for These Patients?

**Scenario 1**
- A 92 y.o. male who has dementia is reportedly staying up all night, and sundowning. He is taken to the emergency room because he got belligerent with his caretaker. He is using the Exelon patch, and takes Namenda, metformin, amlodipine, and furosemide. He is prescribed trazodone 50mg QID for sleep.

**Scenario 2**
- An 87 y.o. female who has severe COPD is reportedly not sleeping despite the use of Ambien, lorazepam, Percocet, and mirtazapine. She uses oxygen and takes Senna, losartan, metoprolol, aspirin, lovastatin, and a multivitamin.
Where Do You Find Additional Information on Deprescribing?

- NPS Medicine Wise
  https://www.nps.org.au/

- Better Practice
  http://www.bpac.org.nz/
Closing Comments

- Recognize patients at risk for medication-related problems due to polypharmacy.
- Utilize the appropriate tools to recognize inappropriate medication use in the aging population.
- Implement appropriate polypharmacy tools for minimizing the inappropriate use of medications based on the clinical setting of the patient.
- Apply strategies to identify and resolve medication related problems.
- Deprescribe medications based on pharmacology, utility, and other factors.
- Provide recommendations to ensure positive therapeutic outcomes.
For further questions:

Angela M. Hill, Pharm.D., RCPPh
ahill2@health.usf.edu
813.974.2551