SAFE PRESCRIBING IN THE ELDERLY
Bailey Fitzgerald, MD
Week 24

Educational Objectives:

1. Practice strategies to aid in medication reconciliation and identify polypharmacy in older adults
2. Incorporate evidence-based guidelines when choosing appropriate medications in a geriatric population
3. Describe tools for de-prescribing inappropriate medication

CASE ONE:

Ms. Pillsbury is a 78-year-old woman with hypertension and type II diabetes. Until recently, she lived alone in a senior independent living community, and is moderately active. She enjoys tending to her plants and visiting with her grandchildren. Ms. Pillsbury was recently discharged from the hospital after a fall, where she sustained a concussion and a complex wrist fracture, the latter requiring surgical repair. After hospital discharge, she and her family decided to sell her condo, and she has just moved to your community to live with her daughter. She presents to clinic today to establish primary care.

Questions:

1. When should a medication reconciliation be performed? Should it be part of Ms. Pillsbury’s visit today?
   There is never a wrong time to do a medication reconciliation! This interdisciplinary procedure can be performed by physicians, in visits with pharmacists, or by nursing staff. However, according to the Institute for Healthcare Improvement, 50% of all medication errors and up to 20% of adverse drug events in the hospital can be attributed to poor medication reconciliation surrounding transitions of care. They therefore recommend a systematic approach to reconciling medications every time a patient moves from one setting to another (IHI, 2011).

   In this case, our patient is undergoing several transitions, including hospital discharge, moving, and establishing primary care at a new practice. Therefore, a thorough medication reconciliation is indicated.
2. **What are the components of a medication reconciliation?**

   The IHI lists three steps involved in a medication reconciliation (IHI, 2011):

   - **Verification (collection of the medication history):** Includes drug name, dosage, frequency, and route. Strategies for this step involve interviewing the patient, and in the case they are not able to provide a list, interviewing family members or friends, other care providers, or reviewing pharmacy and past medical records. You may suggest that the patient bring home medications to each visit. Some offices may print a list of medications at check in to review before the physician sees the patient or enlist nursing staff in assembling or reviewing a medication list prior to the visit. Given multiple recent transitions, this step may be a particularly difficult one for this patient. One strategy might be to use the most recent hospital discharge list and compare this with the medications that the patient has been taking at home before and after hospitalization.

   - **Clarification (ensuring that medications and doses are appropriate)**

   - **Reconciliation (documenting changes in the orders):** Includes providing the patient, caregivers, and all parties responsible for administering medications an up-to-date medication list. Some offices may have a practice of forwarding an updated list to other providers, including consulting specialists and pharmacists. The patient should always be included and provided with a copy of their medication list.

**CASE ONE CONTINUED:**

Ms. Pillsbury tells you that she’s unsure about the names of her medications. (“There are just too many to remember!”) She uses a pill box to organize her medications, which is filled every other week with help from her daughter. In addition to the medications in her pill box, she also has several medications that are kept separately, for pain and sleep, which she takes “as needed”. She agrees to get bloodwork today and agrees to bring her medications to her next follow-up visit.

When you see her again, Ms. Pillsbury returns to your office with all her medications carried in a shopping bag. You go through the bag with Ms. Pillsbury.
CASE ONE CONTINUED:

Ms. Pillsbury’s medications:

Metoprolol Tartrate 50mg BID
Lisinopril 20mg daily
Furosemide 40mg daily
Atorvastatin 80mg daily
Aspirin 81mg daily
Oxycodone 5mg every 6 hours as needed
Zolpidem 5mg as needed for sleep
Metformin 500mg daily
Insulin Glargine 10U nightly
Omeprazole 40mg daily

3. Does Ms. Pillsbury’s medication regimen qualify as “polypharmacy”? Why does it matter?
   The definition of polypharmacy is variable. A 2017 review in BMC Geriatrics found more than 138 definitions of polypharmacy used in the literature, ranging from numerical to descriptive. The most commonly reported definition was the numerical criteria of five or more medications taken on a daily basis (Masnoon, 2017). Studies of older adults have found that as many as 58% of patients take one or more medically unnecessary prescription medication (Rossi, 2007). Although confounders are an obvious drawback within this literature, retrospective analysis of polypharmacy in the multi-morbidity of a geriatric population has shown it to be associated with increased healthcare costs, increased adverse drug events, medication non-adherence, declining functional status, cognitive impairment, and falls (Maher, 2016).

4. Do all of Ms. Pillsbury’s medications have an indication? Does Ms. Pillsbury have any medical problems for which medication is indicated, but for which she is not being treated?

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Indication</th>
<th>Treatment or Prevention?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoprolol</td>
<td>Hypertension</td>
<td>Treatment</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>Hypertension</td>
<td>Treatment</td>
</tr>
<tr>
<td>Furosemide</td>
<td>? Hypertension</td>
<td>Treatment</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>Hyperlipidemia</td>
<td>Primary Prevention ASCVD</td>
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<tr>
<td>Aspirin</td>
<td>Hyperlipidemia</td>
<td>Primary Prevention ASCVD</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>Pain</td>
<td>Treatment</td>
</tr>
<tr>
<td>Zolpidem</td>
<td>Insomnia</td>
<td>Treatment</td>
</tr>
<tr>
<td>Metformin</td>
<td>Diabetes</td>
<td>Treatment</td>
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<tr>
<td>Insulin</td>
<td>Diabetes</td>
<td>Treatment</td>
</tr>
<tr>
<td>Omeprazole</td>
<td>?</td>
<td>Treatment?</td>
</tr>
</tbody>
</table>
As listed in the above chart, several of Ms. Pillsbury’s medications are prescribed without clear indication (omeprazole, furosemide). In addition, her recent fracture seems concerning for a fragility fracture, and may be indicative of untreated osteoporosis/osteopenia. You can consider using a validated tool for assessing risk of fragility fracture based on clinical history and DEXA scores, e.g. the Frax Tool.

**CASE ONE CONTINUED:**

After reviewing the medications, you ask Ms. Pillsbury some clarifying questions. She takes the oxycodone about once daily (it was prescribed after her surgery); it makes her feel loopy, so she doesn’t like to take it in the mornings but will often take it before bed when her wrist is sore. She has never had any heart disease or heart failure; she can’t remember when she started the furosemide. She also doesn’t remember why she’s taking omeprazole—“Isn’t that the one for my cholesterol?” she asks. When she takes all her medications together, she admits she sometimes feels weak, and lightheaded, especially in the morning before breakfast. Her daughter has checked a fingerstick reading during some of these episodes and has noted that her blood sugars are as low as 45 or 50 during these occasions. She does not regularly monitor her blood pressure at home.

You review the indications for all the medications with Ms. Pillsbury.

On physical exam today, Ms. Pillsbury is afebrile, with a blood pressure of 102/58, and HR of 60. She weighs 130lbs, and her BMI is 22. She is not orthostatic. Aside from a well-healed incision on her wrist and mild tenderness over her healing fracture, the remainder of her physical exam is unremarkable.

Her labs from last week have resulted, and you go over them today:
- CBC: Hgb 14.2, Plt 256
- Lipids: Tchol 178, HDL 35
- BMP: Na 137, K 4.3, Cr 1.1 (eGFR 51.1)
- A1c: 6.6%

5. **Are any of Ms. Pillsbury’s medications potentially inappropriate for a geriatric population? How will you decide?**

In a geriatric patient, a good place to start to evaluate medications is the Beer’s Criteria, a list of medications published by the American Geriatrics Association identifying those that may be potentially inappropriate to prescribe in a geriatric population (AGS, 2019). For this patient, both oxycodone and zolpidem are identified as particularly high-risk medications.

Another tool is the Screening Tool of Older People's Prescriptions (STOPP) / Screening Tool to Alert to Right Treatment (START Criteria), designed to facilitate appropriate prescribing in the elderly (Omahony, 2014). In this case, they would suggest considering...
STOPPingu: PPI (in the absence of PUD or refractory reflux disease), OPIOIDS for pain control, and FUROSEMIDE for hypertension.

In addition, they suggest STARTing to consider DEXA to assess need for bisphosphonate/Vitamin D-Calcium. They also would recommend prescribing a fitness regimen and/or physical therapy for a history of falls.

Of note, it is also important to assess if any medications need to be adjusted based on CrCl, which is not necessary in this case.

6. **What is the primary goal of each of her medications (i.e., treatment or prevention)? If treatment, are there specific targets the medications are meant to achieve? Can you change doses of any of these medications or discontinue some and still meet those goals?**

Goal setting in the elderly should be a very individualized process, often balancing the priorities of multiple diseases against one another and aligning these with the patient’s own priorities. However, in Ms. Pillsbury’s case, recently updated national guidelines can provide some recommended targets.

A 2019 American College of Cardiology (ACC) guideline on primary prevention recommends against the routine use of aspirin for the goal of primary prevention of cardiovascular disease (Arnett, 2019). A subset of the 2017 ACC guidelines addressing hypertension treatment in older persons recommends “treatment of hypertension with a SBP treatment goal of less than 130 mm Hg is recommended for noninstitutionalized ambulatory community-dwelling adults (≥65 years of age) with an average SBP of 130 mm Hg or higher”, largely based on subgroup analysis of SPRINT trial data showing improvement in stroke risk, while emphasizing that this goal should be individually adjusted based on life expectancy and comorbidities (Wheaton, 2017).

Similarly, a 2019 position statement from the ADA (American Diabetes Association) regarding Standards of Medical Care in Diabetes recommends “Less stringent A1C goals (such as <8%) may be appropriate for patients with a history of level 3 hypoglycemia (altered mental and/or physical state requiring assistance), limited life expectancy, advanced microvascular or macrovascular complications, extensive comorbid conditions, or long-standing diabetes in whom the goal is difficult to achieve…” (ADA, 2019).

Especially when the goal of medication is prevention rather than treatment of existing symptoms, it may be helpful to consider life expectancy when weighing potential benefits. Online tools such as ePrognosis.org can be helpful in assessing life expectancy based on age, functional status, and comorbidities.

You decide that based on the Beer’s Criteria, you should discuss discontinuing the oxycodone and zolpidem, as they are potentially inappropriate medications in a geriatric population. In addition, you decide that aspirin for primary prevention is no longer
recommended and may pose increased bleeding risks in the geriatric population. Based on the STOPP/START Criteria, you also discuss stopping omeprazole and furosemide.

You also review Ms. Pillsbury’s blood pressure goals (SBP <130) and A1c goals. She notes that her insulin has been hard for her to manage, as well as expensive for her to purchase. You agree to set an individual goal of 7.5% for A1c going forward, and trial discontinuing the lantus insulin.

**CASE ONE CONTINUED:**

You adjust her medications based on safety, efficacy and her preferences. She is excited about the prospect of taking less medication.

7. **Now that you’ve reached these decisions, what tools can you use to de-prescribe these medications?**

Online resources such as Deprescribing.org (developed by the Bruyère Research Institute in Ottawa and the Université de Montréal) offer worksheets and evidence-based algorithms for safely de-prescribing medications. Their algorithm for Benzodiazepine Receptor Agonists (BZRA) or “Z”-drugs (such as Ms. Pillsbury’s zolpidem) recommends tapering doses of BZRA (25% every two weeks), as well as offering sleep hygiene and Cognitive Behavioral Therapy for insomnia.

In discontinuing insulin, they recommend monitoring fingersticks at least daily for one to two weeks and emphasize points to review signs of hyperglycemia with patients. Also recommended is an omeprazole taper, to avoid rebound reflux symptoms.

A commonly emphasized principle is that it is important for successful de-prescribing to not only discontinue unwanted medications, but also to offer alternatives, such as scheduled acetaminophen for pain or non-pharmacologic alternatives for symptom control, such as physical therapy.
CASE ONE CONTINUED:

After discussing these changes with Ms. Pillsbury, you complete the medication reconciliation by updating the medication list in your EMR, sending an updated prescription list to your local pharmacy. You also call Ms. Pillsbury’s visiting nurse program to provide them with an updated medication list.

When she returns to your office three months later, she is happy to report that she has had no further falls. She is no longer taking any medications for sleep, although she is still taking acetaminophen most days for soreness in her wrist. When you check her blood pressure, it is 115/68, and her A1c on repeat is 7.3%. Less overwhelmed now that she’s settled into her new routines, she is open to discussing osteoporosis screening.
Primary Reference:


Additional References:

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Knowledge Questions:

1. According to the 2019 Beer’s Criteria Update, which of the following medications has anticholinergic effects which may precipitate or worsen delirium?
   a. Metoprolol
   b. Aspirin
   c. Mineral Oil
   d. Ranitidine

2. An 82-year-old woman with COPD, recurrent UTIs, hypertension, and chronic kidney disease is noted by her PCP to have CrCl <30 mL/min. Which of the following medications should be avoided or dose reduced?
   a. Amlodipine
   b. Nitrofurantoin
   c. Azithromycin
   d. Clindamycin

3. Which of the following would be appropriate first-line interventions for treating insomnia in a 90-year-old gentleman?
   a. Cognitive Behavioral Therapy
   b. Melatonin
   c. Zolpidem
   d. Trazodone

Answers:

1. d  In the 2019 Beer’s Criteria update, H2 receptor antagonists (including cimetidine, famotidine, ranitidine) were removed from the “avoid” list in patients with dementia, as despite their known anticholinergic properties there is only weak evidence that these medications can cause delirium. In addition, the panel was concerned that the inclusion of this criteria would lead to PPI overuse. However, the recommendation was kept within the new criteria to “avoid” H2- receptor antagonists in patients with delirium, as the anticholinergic effects may worsen or prolong the symptoms.

2. b  According to the AGS, nitrofurantoin use, especially long-term use, in elderly patients with CrCl <30 mL/min has been associated with pulmonary toxicity, hepatotoxicity, and peripheral neuropathy.

3. a  The AGS recommends against routine pharmacotherapy for the treatment of insomnia in the elderly, and particularly notes the high risks of delirium in patients treated with benzodiazepine receptor agonists, and an increase in falls for elderly patients treated with SSRIs/SNRIs. The Bruyère research group recommends CBT as a safer and more effective alternative, especially in older adults.