

**Interprofessional Geriatrics Training Program**

**Medication Management in Older Adults**






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**Acknowledgements**

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**Learning Objectives**

Upon completion of this module, learners will be able to:

1. Define medication management and describe its impact on patient outcomes
2. Identify information that should be collected from patients and caregivers in order to perform a comprehensive assessment of medication therapy
3. Describe common medication-related problems (MRPs) in the older adult population and discuss strategies for addressing MRPs
4. Integrate a systematic approach to medication management



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Case Study



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Case: Medication Management in Older Adults

- Mrs. Roberts is a 77-year-old widow who lives alone
- She has multiple medical problems, which include: chronic obstructive pulmonary disease (COPD), hypertension (HTN), diabetes mellitus (DM), coronary artery disease (CAD), cerebral vascular accident (CVA), osteoporosis, osteoarthritis (OA), gastroesophageal reflux disease (GERD), anxiety, insomnia, allergic rhinitis, and glaucoma
- She has a history of multiple falls at home and currently smokes 4 cigarettes/day
- She has prescription insurance (Medicare Part D)
- She has difficulty affording her monthly copayments, and she tries to take her medications as prescribed; however, she misses doses



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Case: Medication Management in Older Adults

- Case exemplifies the challenges of managing multiple chronic conditions and multiple drug therapies
- Using current practice guidelines, Mrs. Roberts' case would result in 12 medication recommendations and a complex drug regimen
- She is taking 21 medications
- She has many symptoms for which older adults seek out self-care strategies, adding to the pill burden, and which often go unrecognized
- Regimen complexity may result in:
  - Adverse drug events (ADEs)
  - Drug duplication
  - Nonadherence
  - Financial toxicity



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### Case: Medication Management in Older Adults

#### Her Medications Include

- Budesonide/formoterol, albuterol, amlodipine, insulin glargine, insulin aspart, sitagliptin, alendronate, acetaminophen, diclofenac gel, glucosamine, melizine, omeprazole, mirtazapine, zolpidem, trazodone, diphenhydramine, fluticasone, estrogen vaginal cream, triamcinolone cream, and timolol eye drops

#### Clinical Implications

- What concerns would you have about this older adult with respect to medication management and medication taking behavior?
- What is the role of comprehensive medication management for Mrs. Roberts?



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### Medication Management: What Is It?

#### Definitions

- Medication review:
  - The systematic assessment of the pharmacotherapy of an individual patient that aims to evaluate and optimize medication by providing a recommendation or by making a direct change (Christensen & Lundh, 2016)
  - No universally accepted definition, but it generally involves an assessment of the efficacy and harms of each medication prescribed



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### Medication Management Continued

#### Definitions

- Medication Therapy Management (MTM):
  - Distinct service or group of services that optimizes therapeutic outcomes for individual patients
    - Note: Consensus definition adopted by pharmacy professional organizations in 2004 (Bumil et al., 2005)
  - With the Medicare Prescription Drug Improvement and Modernization Act (MMA) of 2003, insurers are required to provide MTM services to a subset of Medicare Part D beneficiaries (MMA, 2003; Pellegrino et al., 2004)



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**Medication Management Continued**

**Definitions**

- MTM framework/definition expanded to include 5 core elements:
  - Medication therapy review
  - Creating a patient's personal medical record
  - Developing a medication-related action plan
  - Intervention or referral
  - Documentation/follow-up (APHA/NAACBS, 2006)
- MTM is the responsibility of the interprofessional team, including:
  - Pharmacists
  - Prescribers
  - Nurses
  - Social workers
  - Patients
  - Caretakers




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**Medication Therapy Management (MTM)**

**Activities and/or Responsibilities Include (But Not Limited To):**

- Performing or obtaining necessary assessments of the patient's health status
- Formulating a medication treatment plan
- Selecting, initiating, or modifying medication therapy
- Monitoring and evaluating the patient's response to therapy, including safety and efficacy
- Performing a comprehensive medication review to identify, resolve, and prevent medication-related problems, including adverse drug events



(MTM Executive Summary, 2004)

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**Medication Therapy Management (MTM) Continued**

**Activities and/or Responsibilities Include (But Are Not Limited To):**

- Document the care delivered and communicate essential information to the patient's other primary care providers
- Provide verbal education to enhance patient understanding and appropriate use of medications
- Provide information, support services, and resources to enhance patient adherence to therapeutic regimens
- Coordinate and integrate medication therapy management (MTM) services within the broader health care management services being provided to the patient



(MTM Executive Summary, 2004)

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**Medication Management Continued**

**Comprehensive Medication Management (CMM)**

- Defined by the Patient-Centered Primary Care Collaborative (PCPCC) for use in the Patient-Centered Medical Home (PCMH) model
- CMM ensures each patient's medications (prescription, non-prescription, alternative medication, traditional vitamins, or nutritional supplements) are individually assessed to determine that each medication is appropriate for the patient, effective for the medical condition, safe to take given the comorbidities and other medications being taken, and able to be taken by the patient as intended (PCPCC, 2012)




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**Medication Management Continued**

**Comprehensive Medication Management (CMM) Includes:**

- Individualized care plan that achieves the intended goals of therapy
- Appropriate follow-up to determine actual patient outcomes

**Patient Role:**

- Understands, agrees with, and actively participates in treatment regimen to optimize the medication experience and clinical outcomes




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**Medication Management Continued**

- Comprehensive Medication Management (CMM) involves specific procedures

Assess	}	<ul style="list-style-type: none"> <li>• Assessment of medication-related needs</li> <li>• Identification of medication-related problems</li> </ul>
Plan	}	<ul style="list-style-type: none"> <li>• Development of a care plan with individualized therapy goals and interventions</li> <li>• Follow-up evaluation to determine patient outcomes</li> </ul>




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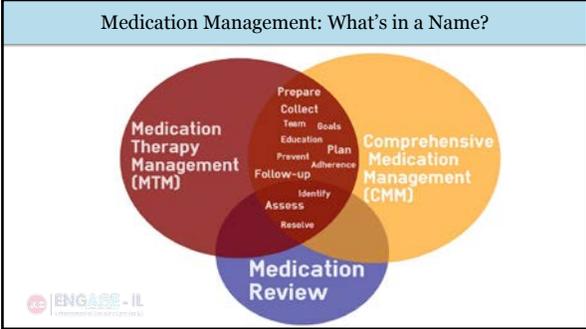
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**Medication Management**

- At the core of medication therapy management (MTM), comprehensive medication management (CMM), and medication review are:
  - Preparation
  - Collection
  - Follow-up
  - Assessment of a patient's medication

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**Medication Management**

- Medication Therapy Management (MTM), Comprehensive Medication Management (CMM), and Medication Review also consider collaborative teams, developing goals, education, prevention, adherence, planning, identification, and resolution as important factors
- MTM and CMM go beyond Medication Review to incorporate steps to fully develop and monitor individualized medication strategies

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Medication Management Value and Impact of Medication Management	
Question	Evidence: Positively Impacts and Reduces Overall Health Care Costs
Why perform medication management?	<ul style="list-style-type: none"> <li>Improves medication appropriateness (Christchilles et al., 2004; Cooper et al., 1998; Hanlon et al., 1996)</li> <li>Decreases use of high-risk medications (Christchilles et al., 2004)</li> <li>Decreases use of psychoactive medications (Weber et al., 2008)</li> <li>Decreases overall number of medications (Loughan et al., 2007; Williams et al., 2004)</li> <li>Reduces medication-related problems (Isett et al., 2008; Kriska et al., 2001; Reiff et al., 2016; Smith et al., 2011)</li> </ul>

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Medication Management Value and Impact of Medication Management	
Question	Evidence
Why perform medication management?	<ul style="list-style-type: none"> <li>Reduces omissions of therapy (Schmader et al., 2004)</li> <li>Reduces health care expenditures (Isett et al., 2008; Smith et al., 2011; Williams et al., 2004)</li> <li>Reduces emergency department visits (Christensen &amp; Lundh, 2016)</li> <li>Decreases risk of serious adverse drug events (Schmader et al., 2004)</li> <li>Identifies barriers to nonadherence (Reiff et al., 2016)</li> </ul>

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Medication Management: Where?	
Question	Evidence
Where is medication management performed?	<ul style="list-style-type: none"> <li>Primary care offices (Cooper et al., 1998; Hanlon et al., 1996; Kriska et al., 2006; Loughan et al., 2007; Smith et al., 2011)</li> <li>Ambulatory care clinics (Isett et al., 2008; Schmader et al., 2004; Weber et al., 2008)</li> <li>Geriatric clinics (Williams et al., 2004)</li> <li>Community pharmacies (Christchilles et al., 2004)</li> <li>Hospital wards (Christensen &amp; Lundh, 2016; Schmader et al., 2004)</li> </ul>

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Medication Management: Where?	
Question	Evidence
Where is medication management performed?	<ul style="list-style-type: none"> <li>• Home (Kruka et al., 2001; Lenaghan et al., 2007)</li> <li>• Home health visits (Reidt et al., 2016)</li> <li>• Long-term care (Ellis et al., 2012)</li> <li>• Hospice (Eichens et al., 2010)</li> </ul>

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Medication Management: When?	
Question	Evidence
When is medication management performed?	<ul style="list-style-type: none"> <li>• During hospitalization (Christensen &amp; Landth, 2016; Schmauder et al., 2004)</li> <li>• After hospital discharge (Schmauder et al., 2004)</li> <li>• Over 2 visits (Lenaghan et al., 2007; Smith et al., 2011; Williams et al., 2004)</li> <li>• Multiple visits (at ≥ 3 clinic visits) (Hanson et al., 1996; Smith et al., 2011)</li> <li>• In between physician visits (with pharmacist) (Reidt et al., 2016; Smith et al., 2011)</li> <li>• When caregivers are present or absent, as long as the patient is cognitively intact (Lenaghan et al., 2007)</li> <li>• Keys are to be aware that the process is continuous and should be completed at each visit</li> <li>• Particular attention should be given to time of care transitions (Christensen &amp; Landth, 2016; Eichens et al., 2010; Reidt et al., 2016)</li> </ul>

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Medication Management: Who?	
Question	Evidence
Who performs medication management?	<ul style="list-style-type: none"> <li>• Pharmacists (Christensen et al., 2004; Christensen &amp; Landth, 2016; Cropper et al., 1998; Eichens et al., 2010; Hanson et al., 1996; Tettez et al., 2006; Kruka et al., 2001; Lenaghan et al., 2007; Reidt et al., 2016; Smith et al., 2011; Weber et al., 2008)</li> <li>• Pharmacists and pharmacy technician teams (Christensen &amp; Landth, 2016)</li> <li>• Pharmacists and physician teams (Christensen &amp; Landth, 2016)</li> <li>• Physicians who specialize in clinical pharmacology (Christensen &amp; Landth, 2016)</li> <li>• Geriatricians (Weber et al., 2008)</li> <li>• Physicians after training with pharmacists (Kruka et al., 2006)</li> <li>• Interdisciplinary teams (Schmauder et al., 2004; Williams et al., 2004)</li> <li>• Nurses (Ellis et al., 2012)</li> </ul>

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Medication Management: Who?	
Question	Evidence
Who should receive medication management?	<ul style="list-style-type: none"> <li>Older adults <math>\geq</math> 60 years <small>(Cooper et al., 1998; Hanlon et al., 1996; Koska et al., 2001; Reidt et al., 2016; Schmauder et al., 2004; Williams et al., 2004)</small></li> <li>Older adults <math>\geq</math> 70 years <small>(Weber et al., 2008)</small></li> <li>Older adults <math>\geq</math> 80 years <small>(Loughan et al., 2007)</small></li> <li>All older adults with multiple chronic conditions and who are taking <math>\geq</math> 4 medications (polypharmacy) <small>(Cooper et al., 1998; Hanlon et al., 1996; Koska et al., 2001; Loughan et al., 2007; Reidt et al., 2016; Weber et al., 2008; Williams et al., 2004)</small></li> </ul>

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Assessment Question 1
<p><b>What are the benefits of a comprehensive medication management program? Choose all that apply.</b></p> <ul style="list-style-type: none"> <li>a) Reduces polypharmacy</li> <li>b) Increases health care spending</li> <li>c) Reduces medication-related problems</li> <li>d) Reduces use of high-risk medications</li> </ul>

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Assessment Question 1: Answer
<p><b>What are the benefits of a comprehensive medication management program? Choose all that apply.</b></p> <ul style="list-style-type: none"> <li><b>a) Reduces polypharmacy (Correct Answer)</b></li> <li>b) Increases health care spending</li> <li><b>c) Reduces medication-related problems (Correct Answer)</b></li> <li><b>d) Reduces use of high-risk medications (Correct Answer)</b></li> </ul>

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**Assessment Question 2**

*Which health care provider(s) should conduct a comprehensive medication management review in an older adult?*

- a) Pharmacist
- b) Prescriber
- c) Nurse
- d) All of the above



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**Assessment Question 2: Answer**

*Which health care provider(s) should conduct a comprehensive medication management review in an older adult?*

- a) Pharmacist
- b) Prescriber
- c) Nurse
- d) All of the above (Correct Answer)**



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**Performing Medication Management**



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**Medication Management: How?  
A Systematic Approach**

**Step 1: Prepare for the Medication Review**

- Prepare to perform a careful assessment of all medications in a patient's regimen
  - Use a reliable drug information source to look up unfamiliar medications
  - Ensure familiarity with age-related pharmacokinetic/ pharmacodynamic changes, clinical practice guidelines, expert consensus guides (Beers criteria, STOPP/START), and postmarketing surveillance data regarding medication use in older adults (AGS, 2015; O'Mahony et al., 2015)
  - Review *Drug Therapy in Older Adults* module at <http://engageil.com>
  - Develop questions to ask patient/caregiver to ensure complete history



(APHA, 2008, 2014a, 2014b; Lowe et al., 2000; PCFCC, 2012)

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**Medication Management: A Systematic Approach**

**Step 2: Collect Information**

- From the medical and pharmacy record (prior to visit)
- From the patient/caregiver (during patient encounter)
- If performing medication therapy management (MTM) in a setting without access to the medical record:
  - Ask patient to bring in information about vitals and labs to their visit
  - Alternatively, have them sign a consent for review of medical records



(APHA, 2008, 2014a, 2014b; Lowe et al., 2000; Strickman & Hankin, 2010)

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**Medication Management: A Systematic Approach**

**Step 2: Collect Information**

**A. From the Medical and Pharmacy Record (Prior to Visit)**

- Review patient's medical history and prior documentation
- Review vitals and available laboratory tests
- Review available medication list(s) using previous visit documentation or hospital discharge summary
- Purpose: To identify possible drugs taken and indications



(APHA, 2008, 2014a, 2014b; Lowe et al., 2000; Strickman & Hankin, 2010)

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**Medication Management: A Systematic Approach**

**Step 2: Collect Information**  
**B. From the Patient/Caregiver (During Patient Encounter)**

- Confirm details of all medications (i.e., compile an accurate medication list!)
- Confirm indications are still valid
- Identify unaddressed problems
- Determine adherence
- Gather information about the patient's feelings, thoughts, and preferences about health conditions and goals of therapy
- This step of collecting medication information and compiling an accurate list of medication is critically important before any attempt to optimize medication therapy

 (APNA, 2008, 2014a, 2014b; Lowe et al., 2000; Steinman & Hanlon, 2010)

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**Discrepancies in Medication Use**

- Discrepancies are common when comparing patient-reported medication use with prescribers' orders (Hedell et al., 2000)
  - Upon comparison of medication bottles to the medical record, one private practice found medication discrepancies in 75% of patients
  - The most frequent discrepancies included using medications not accounted for in the medical record (51%), stopping recorded medications (29%), or taking different doses (20%)
  - Older age, greater number of medications, and having more than one prescriber were significant predictors of discrepancies



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**Discrepancies in Medication Use**

- The Medication Discrepancy Tool would
  - Fill the gap in the identification and categorization of transition-related medication problems
  - Facilitate resolution of these problems by describing appropriate action steps (at patient or system level)
  - Lead to a single reconciled list of medications irrespective of the number of prescribers involved
  - Include patient and system level discrepancies which include an investigation whether nonadherence is intentional or unintentional

 (Smith et al., 2004)

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**Discrepancies in Medication Use**

- Incomplete documentation of home medications can also lead to discrepancies and prescribing errors in the inpatient setting and can result in transfer-related medication errors upon transition from the hospital to the nursing home setting and vice versa (Brockvar et al., 2004; Dohranski et al., 2002; Steinhilber et al., 2010)
- Post-hospital medication discrepancies increase risk of readmission within 30 days (Caldeman et al., 2005)




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**Discrepancies in Medication Use: Practice Implications**

- Medication reconciliation, the process of obtaining and maintaining an accurate and complete list of a patient's current medications and comparing this list with the physician's orders, is a critical component of medication management (Steinhilber et al., 2010)
- The potential for error and miscommunication is created at transitions of care; therefore, medication reconciliation should be carefully performed at these times by skilled clinicians
- Let's apply Step 2 (collecting information and medication reconciliation) to the case of Mrs. Roberts




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**Case: Mrs. Roberts**

- Mrs. Roberts is a 77-year-old widow who lives alone
- She has multiple medical problems, which include: chronic obstructive pulmonary disease (COPD), hypertension (HTN), diabetes mellitus (DM), coronary artery disease (CAD), cerebral vascular accident (CVA), osteoporosis, osteoarthritis, gastroesophageal reflux disease, anxiety, insomnia, allergic rhinitis, and glaucoma
- She has a history of multiple falls at home and currently smokes 4 cigarettes/day
- She has prescription insurance (Medicare Part D)
- She has difficulty affording her monthly copayments, and she tries to take her medications as prescribed; however, she misses doses




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Case: Mrs. Roberts

**Practice Implications/Application**

- How do you approach collecting information (e.g., medication use, adherence, goals of therapy, health preferences) from the patient/caregiver?
- What questions do you ask?



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Medication Management: Step 2B –  
Collect Information: Medication History

**Medication History**

- Have the patient bring in all medications (i.e., brown bag review)
- Ask the patient/caregiver about:
  - Prescription medications
  - Over-the-counter products
  - Herbal products, supplements, vitamins
  - Non-oral medications (inhalers, topicals, eye/ear drops, suppositories)
  - As needed medications
- Ask about pertinent past medication and recent medication changes



(APHA, 2014a, 2014b)

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Collect Information: Medication History

- If medications are not brought in, obtain a list of medications and contact community pharmacies to fill in the gaps
- If this is not feasible due to time constraints, use other team members (such as on-site clinical pharmacists) to assist with medication history
- If a clinical pharmacist is not available, or the patient list is unreliable, focus on highest risk medications such as antithrombotics and insulin, or medications with the greatest benefit, such as statins for secondary prevention



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**Collect Information: Medication History**

- Determine who the medication manager is at home (e.g., patient or caregiver) and what organizational tools (e.g., pill boxes) are used
- Review each medication for potential side effects; specifically ask about high-risk symptoms such as orthostasis (Steinman & Hankin, 2010)
- Screen for any new symptom that could be attributable to an adverse drug event, side effect, or allergy to medication (Lee et al., 2009)
- Ask about all medication-related concerns and barriers such as cost, complicated regimen, visual or functional impairment, or low literacy (APSA, 2014a, 2014b)




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**Collect Information: Medication Preferences and Goals**

**Medication Experience**

- Medication history should uncover the patient's medication experience, including preferences, concerns, understanding, and expectations about medications
- Goal of medication management is to positively impact the health outcomes of the patient, which necessitates actively engaging them in the decision-making process; therefore, it is important to understand the patient's medication experience
- Important to understand the patient's medication experience
- It may be preferred in some cases to initiate discussion prior to diving into the detailed medication history



(PCFCC, 2012)

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**Collect Information: Medication Preferences and Goals**

- For older patients, or those with a limited life expectancy, the patient's goals of therapy should be ascertained and incorporated into the medication strategy
- Preventive therapies or medications with benefits achieved in the future may no longer be appropriate if the risks or side effects negatively affect the patient's quality of life
- You can determine how patients make decisions about:
  - Whether to have a medication filled
  - Whether to take it
  - How long to take it

**Medication Preferences**

- Which medications do you believe are helpful?



(PCFCC, 2012)

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**Collect Information: Medication Preferences and Goals**

**Goals of Therapy/Patient Preferences**

- Can you share with me what you are hoping for with this medication? (Tijer et al., 2014)
- Which medications would you like to avoid in the future? Why?
- What is important to you now?
- These questions give the provider opportunities to correct any misconceptions about medications and discuss how harms may outweigh benefits
- The patient and family may be more open to making stepwise changes to medications, such as reducing the dose and evaluating in a week
- The goals of care are the provider's words, not the patient's and family's, so use other words they recognize, ask them about their preferences, what is important to them, what is it they hope for, what is it they want to do?

 (PCPCC, 2012)

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**Collect Information: Medication Preferences and Goals**

**Medication Use**

- For each medication, ask these open-ended questions:
  - What did your physician tell you this medication is for? (Prescriptions)
  - Why are you using this product? (Non-prescriptions)
  - How do you take this medication?
  - How is this medication working for you? (APHA, 2014b; PCPCC, 2012)



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**Collect Information: Medication Preferences and Goals**

**Morisky Medication Adherence Scale**

- Do you ever forget to take your medicine?
- Are you careless at times about taking your medicine?
- When you feel better do you sometimes stop taking your medicine?
- Sometimes if you feel worse when you take the medicine, do you stop taking it?

(Morisky et al., 1986)



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**Collect Information: Medication Preferences and Goals**

**Blame-Free Open-Ended Questions**

- These medications are difficult to take every day. How often do you miss or skip one?
- There are quite a few medications on this list. How many of these do you take?
- Most people don't take all of their medications every day. How about you?
- In a given week, how often would you say you miss a medication? Or drug A? Or drug B?




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**Collect Information: Medication Preferences and Goals**

**Cost-Related Nonadherence**

- During the past 3 months, have you not filled a prescription because it was too expensive?
- During the past 3 months, have you skipped a dose or taken a smaller dose to make the prescription last longer because you were worried about the cost of the medicine? (Marcus et al., 2013; Soumerai et al., 2006)




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**Assessment Question 3**

***Mrs. Roberts is on a complex daily medication regimen to manage her multiple chronic conditions. What information should you collect from Mrs. Roberts during your visit to perform a comprehensive medication review?***

- a) How she takes her medications
- b) Recent medication changes
- c) Her goals/hopes/preferences about medications
- d) Options a and b
- e) Options a, b, and c




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Assessment Question 3: Answer

*Mrs. Roberts is on a complex daily medication regimen to manage her multiple chronic conditions. What information should you collect from Mrs. Roberts during your visit to perform a comprehensive medication review?*

- a) How she takes her medications
- b) Recent medication changes
- c) Her goals/hopes/preferences about medications
- d) Options a and b

**e) Options a, b, and c (Correct Answer)**



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Applying Step 2: Collect Information



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Interview with Expert: Michael J. Koronkowski, PharmD, CGP



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Expert Interview: Michael J. Koronkowski, PharmD, CGP  
The Case of Mrs. Roberts

**Listen to Our Expert Discuss:**

- The case of Mrs. Roberts, who has a poor understanding of how her medications work and how they help her
- Her two-drug regimen for COPD may need to be reevaluated because she is misusing her prescriptions and does not understand them
- She has a complex medication regimen for diabetes, and does not have a good understanding of the role of the diabetes medicines in her care plan



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Expert Interview: Michael J. Koronkowski, PharmD, CGP  
The Case of Mrs. Roberts

**Listen to Our Expert Discuss:**

- The case of Mrs. Roberts, who takes multiple medications for the same problems
- Sleep abnormalities
- Dizziness
- Adverse symptoms:
  - Dry mouth
  - Tiredness
  - Dizziness



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Expert Interview: Michael J. Koronkowski, PharmD, CGP  
The Case of Mrs. Roberts

**Listen to Our Expert Discuss:**

- The case of Mrs. Roberts and polypharmacy
- Drug duplication
- Adverse symptoms
- High blood pressure:
  - Overtreating a problem among older adults



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**Medication Data Collected from Mrs. Roberts  
(Not in Film)**

**Reconciliation of Medications Against Medical Record:**

- Mrs. Roberts stopped using diclofenac gel due to cost; self-initiated ibuprofen
- Mrs. Roberts has not taken trazodone for several months now
- She cannot remember why she stopped, and thinks that “it probably didn’t work”
- No longer using fluticasone nasal spray, triamcinolone cream, and vaginal estrogen cream due to cost
- Mrs. Roberts is using timolol eye drops and inhalers differently than prescribed




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**Medication Management: A Systematic Approach**

- Step 3: Assess





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**Medication-Related Problems (MRPs)**

- Detailed assessment for medication-related problems
- A medication-related problem is any undesirable event experienced by a patient which involves, or is suspected to involve, drug therapy, and that interferes with achieving the desired goals of therapy




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Assess for Medication-Related Problems (MRPs)	
Medication-Related Problem	Common Causes
Unnecessary medication therapy	<ul style="list-style-type: none"> <li>No indication</li> <li>Duplication in therapy</li> <li>Medication being used to treat a side effect of another medication (e.g., "prescribing cascade")</li> <li>Medication not consistent with patient's goals of care</li> </ul>
Untreated or undertreated condition	<ul style="list-style-type: none"> <li>Medical condition requires initiation of medication</li> <li>Preventative medication is omitted</li> <li>Additional medication is needed for optimal treatment of a condition</li> </ul>

 (Steinman & Hanson, 2010; Tomczko et al., 1995)

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Assess for Medication-Related Problems (MRPs)	
Medication-Related Problem	Common Causes
Ineffective medication	<ul style="list-style-type: none"> <li>Medical condition is refractory to the medication product</li> <li>Dosage form is inappropriate</li> <li>Medication product is ineffective for indication</li> </ul>
Dosage suboptimal	<ul style="list-style-type: none"> <li>Dose too low or dosing frequency inadequate for desired response</li> <li>Drug interaction reduces active medication available</li> <li>Duration of therapy is inadequate for desired response</li> </ul>
Dosage excessive	<ul style="list-style-type: none"> <li>Dose too high or dosing interval too frequent</li> <li>Duration of therapy exceeds the necessary time frame</li> <li>Drug interaction increases active medication available</li> <li>Rate of administration is too rapid</li> </ul>

 (Steinman & Hanson, 2010; Tomczko et al., 1995)

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Medication-Related Problems (MRPs)	
Medication-Related Problem	Common Causes
Adverse drug event (ADE)	<ul style="list-style-type: none"> <li>Medication causes an undesirable response/reaction</li> <li>Safer medication is required due to patient risk factors</li> <li>Drug interaction causes an undesirable response</li> <li>Dose increased/decreased or administered too rapidly</li> <li>Medication is contraindicated due to patient factors</li> <li>Inappropriate formulation used</li> </ul>
Drug-disease interaction	<ul style="list-style-type: none"> <li>Medication for one condition exacerbates another condition (e.g., NSAID for arthritis pain may exacerbate heart failure, hypertension, and peptic ulcer disease)</li> </ul>

 (Lowe et al., 2000; Steinman & Hanson, 2010; Tomczko et al., 1995)

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Medication-Related Problems (MRPs)	
Medication-Related Problem	Common Causes
Nonadherence	<ul style="list-style-type: none"> <li>• Patient misunderstands instructions with complex medication regimen</li> <li>• Unaware of purpose of medications</li> <li>• Be unwilling to take the medication (experiencing side effects or perceive medication as ineffective or unnecessary)</li> <li>• Patient forgets to take medication (memory difficulties)</li> <li>• Patient is unable to swallow or self-administer medication (e.g., inhaler, eye drops, injection)</li> <li>• Packaging difficulties (cannot open package or read label)</li> <li>• Medication is expensive/drug availability issues</li> </ul>

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(Lowe et al., 2010; Steinman & Hanson, 2010; Tomczko et al., 1995)

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Assess: Mrs. Roberts' Medications and Conditions (Not on Film)		
Condition	Medication	Potential MRP
Insomnia	<ul style="list-style-type: none"> <li>• Zolpidem</li> <li>• Diphenhydramine</li> <li>• Mirtazapine 30 mg at bedtime</li> </ul>	<ul style="list-style-type: none"> <li>• Drug-disease interactions</li> <li>• Adverse drug event</li> <li>• Ineffective medication</li> <li>• Dosage excessive</li> </ul>

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Assess: Mrs. Roberts' Medications and Conditions (Not on Film)	
Condition	Potential Actions/Comments
Insomnia (Continued)	<ul style="list-style-type: none"> <li>• History of falls and zolpidem (AGS, 2015; O'Mahony et al., 2015)</li> <li>• Adverse effects (e.g., falls, fractures, daytime sedation, delirium with zolpidem) and dry mouth, constipation, confusion with highly anticholinergic diphenhydramine (AGS, 2015)</li> <li>• Tolerance develops when using diphenhydramine as sleep aid (AGS, 2015)</li> <li>• Zolpidem reduces sleep onset latency by only 10-20 minutes (Quem et al., 2016)</li> <li>• Discontinue/taper zolpidem and diphenhydramine</li> <li>• Sedative effects of mirtazapine diminish at higher doses (Dobler, 2012)</li> <li>• Reduce to 7.5-15 mg/day for insomnia treatment (Fawcett &amp; Barkin, 1998)</li> </ul>

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**Assess: Mrs. Roberts' Medications and Conditions  
(Not on Film)**

Condition	Medication	Potential MRP
Diabetes	<ul style="list-style-type: none"> <li>Insulin aspart 4 units three times daily with meals</li> <li>Insulin glargine 12 units daily in the morning</li> <li>Sitagliptin 50 mg daily</li> </ul>	<ul style="list-style-type: none"> <li>Potential adverse drug event</li> <li>Dosage excessive</li> <li>Unnecessary/ineffective medication</li> </ul>




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**Assess: Mrs. Roberts' Medications and Conditions  
(Not on Film)**

Condition	Potential Actions/Comments
Diabetes (Continued)	<ul style="list-style-type: none"> <li>Older adults are at greater risk for hypoglycemia and have higher rates of cognitive dysfunction, leading to difficulties in managing and monitoring complex regimens</li> <li>Due to presence of multiple life-limiting comorbidities (CVA, COPD, CAD), as well as history of multiple falls, it is reasonable to target less intensive blood sugar goals per ADA 2016 guidelines <small>(ADA, 2016)</small></li> <li>Patient's A1C is 6.5%; liberalize diabetic regimen to target A1C &lt; 8% and fasting/pre-meal blood sugar &lt; 150 mg/dL <small>(ADA, 2016)</small></li> <li>Sitagliptin lower effectiveness (↓ A1C 0.5-0.8%) and higher cost vs. other agents (e.g., metformin, ↓ A1C 1-2%)</li> </ul>




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**Assessment Question 4**

***A thorough assessment of Mrs. Roberts' medications reveals several medication-related problems (MRPs). Which of the following are potential medication-related problems?***

- a) Unnecessary medication
- b) Untreated condition
- c) Adverse drug event
- d) Both a and c
- e) All of the above




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Assessment Question 4: Answer

**A thorough assessment of Mrs. Roberts' medications reveals several medication-related problems (MRPs). Which of the following are potential medication-related problems?**

- a) Unnecessary medication
- b) Untreated condition
- c) Adverse drug event
- d) Both a and c
- e) All of the above (Correct Answer)**



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Medication Management: A Systematic Approach

**Step 4: Patient-Centered Plan**

**A. Prioritize the Medication-Related Problems (MRPs)**

- Determine which MRPs can be resolved now and which can be addressed at subsequent visits (APSA, 2014b)
- Determine which MRPs can be addressed within your scope and which require referral or discussion with the prescriber and/or specialist (Lowe et al., 2000)
- Scope: understand the roles of pharmacists and providers



(Lowe et al., 2000)

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Medication Management: Plan, Continued

**Step 4: Patient-Centered Plan**

**B. Medication-Related Problems**

- Consider tapering medications acting on the central nervous or cardiovascular system because these medications are likely to result in medication withdrawal reactions
- Consider alternative medication
- Dose or frequency change
- Initiating new medication
- Technical change (e.g., switch to generic, alter quantities on prescription)
- Monitoring required (e.g., labs, vitals)
- Adherence counseling
- Referral to other providers



(Lowe et al., 2000)

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## Medication Management: Plan, Continued

### Step 4: Patient-Centered Plan

#### B. Discontinuing Medications

- Recognizing an indication for discontinuing a medication
- Identifying and prioritizing the medications to be targeted for discontinuation
- Discontinuing the medication along with proper planning, communicating, and coordinating with the patient and in concert with the care of other clinicians
- Monitoring the patient for beneficial or harmful effects



(Lowe et al., 2009)

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## Common Medications Associated with Withdrawal Reactions

#### Cardiovascular Medications

- Physiologic withdrawal
- Exacerbation of the condition for which the medication was originally prescribed

#### Central Nervous System Medications

- Physiologic symptoms such as flu-like symptoms or insomnia



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## Medication Management: Plan, Continued

### Medications and Classes Associated With Withdrawal

Alpha-antagonists or agonist	Antidepressants
Antihypertensives	Antiparkinson agents
Benzodiazepines	Antipsychotics
ACE inhibitors	Baclofen
Beta-blockers	Diuretics
Antiangina medications	Opioids
Histamine 2-blockers/PPIs	Sedatives/Hypnotics
Anticonvulsants	Steroids
Digoxin	



(Bain et al., 2008)

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**Medication Management:  
Example of Prioritized MRPs/Interventions**

**High-Priority Interventions**

- Prevent falls and adverse effects
- Taper zolpidem
- Reduce amlodipine, anti-diabetic regimen, mirtazapine
- Stop diphenhydramine, meclizine, ibuprofen
- Reduce use of short-acting beta-agonists

**Medium Priority**

- Address adherence and undertreatment
- Counsel on appropriate use of albuterol, long-acting beta-agonists, steroids, and timolol eye drops
- Initiate aspirin and statin for CVA/CAD
- Consider calcium/vitamin D




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**Medication Management:  
Example of Prioritized MRPs/Interventions**

**Lower Priority**

- Address potentially unnecessary or suboptimal medications that have no immediate harm to patient
- Stop omeprazole, glucosamine
- Increase acetaminophen




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**Medication Management: Plan, Continued**

**Step 4: Patient-Centered Plan**

**C. Medication Education**

- Resolve barriers to nonadherence (Nieuwlaet et al., 2014; Steinman & Haalon, 2010)
  - Simplify medication regimens (Claxton et al., 2003)
  - Improve organizational skills (e.g., pill organizers, medication calendars, and family involvement)
  - Use alternative products/devices if difficulty with opening/swallowing/administering
  - Use lower cost medication and assess prescription drug insurance
- Involve the patient in their care plan
- Update medication list in medical record and provide updated list to patient (Shank et al., 2007)
- Provide medication education for each medication to the patient or caregiver (Shank et al., 2007; Waggoner et al., 2002)




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Medication Management: Plan, Continued

**Step 4: Patient-Centered Plan**

**D. Improving Adherence**

- Randomized controlled trials looking at interventions to improve adherence yielded mixed results:
  - Highest quality trials frequently involved enhanced support from family caregivers or allied health professionals such as pharmacists who delivered education, counseling, or daily treatment support
- Simplifying medication regimens (Claxton et al., 2005)
  - Adherence decreases dramatically for persons taking four times a day regimes vs. once daily regimes



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Medication Management: Plan, Continued

**D. Improving Adherence (Continued)**

- Involving patients in developing their care plan may improve adherence if the patient feels invested in his/her own plan of care
  - An accurate updated medication list should be provided to patient with a summary of key details (medication name, purpose, dose and dosing schedule) (Shrank et al., 2007)
  - List should be written in patient-friendly language for intended use by the patient
  - Advise patient to share this list with other health care providers and keep a copy to share if admitted to a hospital or nursing home



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Medication Management: Plan, Continued

**D. Improving Adherence (Continued)**

- Study of patient satisfaction revealed
  - Patients were least satisfied with medication information and viewed it as an area needing improvement
- Meta-analysis indicated
  - One-on-one education improved adherence



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**Medication Management: Plan, Continued**

Drug Name (Generic + Brand)	Indication
Rationale or Benefit	Dose + Dosing Schedule + Missed Doses
Duration of Use	Adverse Effects

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Engaging Elders in Medication Management

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**Medication Management: A Systematic Approach**

**Step 5: Follow-Up**  
**A. Monitoring (Timeframe for Follow-Up Varies)**

- Response to therapy/progress toward goals
- Adverse effects
- Adherence
- New medication-related problems (APSA, 2014); PCPCC, 2012)
- Documentation for response to therapy is necessary to clarify if drug is meeting the therapeutic goal

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**Medication Management: A Systematic Approach**

**Step 5: Follow-Up**  
**B. Periodic Drug Review**

- Appropriate time for assessment to response to drug or change in dose may be as short as one day or as long as several months
- Assessing Care of Vulnerable Elders (ACOVE) project quality indicators state, at the very least, all vulnerable elders should have an annual drug regimen review (Shrank et al., 2007)
  - This can allow for the opportunity for the discontinuation of unnecessary medications as well as the addition of necessary drugs not currently prescribed
- Changes in cognition, function, or geriatric syndromes (falls or hospitalizations) should also trigger a medication review (Reisman & Hankin, 2010)

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Assessment Question 5

*When seeing Mrs. Roberts in the clinic, she tells you she is having problems with her medications. Which of the following should MOST LIKELY be considered as the next step in the context of her overall medication care needs?*

- a) Conduct a comprehensive medication review
- b) Stop all her medications and start over
- c) Make no changes in her drug regimen
- d) Decide for her which medications to stop



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Assessment Question 5: Answer

*When seeing Mrs. Roberts in the clinic, she tells you she is having problems with her medications. Which of the following should MOST LIKELY be considered as the next step in the context of her overall medication care needs?*

- a) Conduct a comprehensive medication review (Correct Answer)**
- b) Stop all her medications and start over
- c) Make no changes in her drug regimen
- d) Decide for her which medications to stop



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Expert Interview: Michael Koronkowski, PharmD, CGP  
Medication Management

**Listen to Our Expert Discuss:**

- The importance of medication management and the creation of an action plan helps to identify:
  - Areas of concern
    - Access
    - Adherence
    - Adverse events
  - Drug-related problems
    - Identify medical conditions we are not treating
    - Identify if we are over-utilizing medication



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Expert Interview: Michael Koronkowski, PharmD, CGP  
Medication Management

**Listen to Our Expert Discuss:**

- The importance of medication management and the creation of an action plan, which helps to:
  - Anticipate problems
    - Drug interactions
    - Adverse drug events (ADE)
    - Patient cannot compensate




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Assess: Mrs. Roberts' Medications and Conditions

Condition	Medication	Potential MRP	Potential Actions/Comments
COPD	<ul style="list-style-type: none"> <li>• Albuterol inhaler</li> <li>• Budesonide/formoterol inhaler</li> </ul>	<ul style="list-style-type: none"> <li>• Adverse drug event</li> <li>• Nonadherence</li> </ul>	<ul style="list-style-type: none"> <li>• Tremor due to over-reliance on albuterol inhaler; counsel on proper use/role of maintenance inhaler</li> <li>• Nonadherence due to cost; reduce overall cost by reducing polypharmacy</li> </ul>




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Assess: Mrs. Roberts' Medications and Conditions

Condition	Medication	Potential MRP	Potential Actions/Comments
CAD/CVA	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Untreated or undertreated conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Initiate antiplatelet (e.g., aspirin) therapy and statin therapy; omitted despite a documented history of CAD or CVA <small>(O'Mahony et al., 2015)</small></li> <li>• Beta blocker indicated with ischemic heart disease <small>(O'Mahony et al., 2015)</small></li> </ul>




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Assess: Mrs. Roberts' Medications and Conditions			
Condition	Medication	Potential MRP	Potential Actions/Comments
Osteoporosis	Alendronate 70 mg weekly	<ul style="list-style-type: none"> <li>Drug-disease interaction</li> <li>Nonadherence</li> <li>Undertreated condition</li> </ul>	<ul style="list-style-type: none"> <li>Caution with oral bisphosphonates and GERD; may consider once yearly infusion (i.e., zoledronic acid) or consider a drug holiday because duration &gt; 5 Y<sup>†</sup> (Watts et al., 2010)</li> <li>Counsel to take alendronate at least 30 minutes before food/medication and sit upright for at least 30 minutes</li> <li>Initiate 1200 mg of calcium and 800-1000 units of vitamin D daily from diet and/or supplements (Cosman et al., 2010)</li> </ul>

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Assess: Mrs. Roberts' Medications and Conditions			
Condition	Medication	Potential MRP	Potential Actions/Comments
GERD	Omeprazole	<ul style="list-style-type: none"> <li>Drug-disease interaction</li> <li>Dosage excessive (duration)</li> </ul>	<ul style="list-style-type: none"> <li>Potential increased risk of fracture of the hip, wrist, and spine with long-term proton pump use (FDA, 2011)</li> <li>Avoid excessive durations (&gt; 8 weeks) of proton pump inhibitor (PPI) use (due to risk of fracture/bone loss and <i>C. difficile</i> infections) (AGS, 2015)</li> <li>Discontinue PPI and monitor for GERD symptoms</li> </ul>




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Assess: Mrs. Roberts' Medications and Conditions			
Condition	Medication	Potential MRP	
OA (Knee)	<ul style="list-style-type: none"> <li>Ibuprofen</li> <li>Acetaminophen (APAP)</li> <li>Glucosamine</li> </ul>	<ul style="list-style-type: none"> <li>Drug-disease interaction</li> <li>Suboptimal dose</li> <li>Ineffective medication/cost</li> </ul>	




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Assess: Mrs. Roberts' Medications and Conditions

Condition	Potential Actions/Comments
OA (Knee) (Continued)	<ul style="list-style-type: none"> <li>NSAIDs increase risk of gastrointestinal bleeding or ulcer in pts &gt; 75 (AGS, 2015); complicate blood pressure control, and increase risk of myocardial infarction and stroke (FDA, 2013)</li> <li>APAP first line for osteoarthritis in "full doses" (1000 mg dose) (ACR, 2012; AGS, 2009)</li> <li>Glucosamine not recommended by American College of Rheumatology for OA of the knee/hip (ACR, 2012)</li> <li>Discontinue NSAID and glucosamine; increase APAP/counsel on regular use (i.e., 1000 mg three times daily)</li> </ul>




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Assess: Mrs. Roberts' Medications and Conditions  
(Not in Film)

Condition	Medication	Potential MRP	Potential Actions/Comments
HTN	Amlodipine 10 mg daily	Dosage excessive	<ul style="list-style-type: none"> <li>Blood pressure well below goal (&lt;140/90 per JNC8 (James et al., 2013)ASH/ISH (Weber et al., 2012))</li> <li>Potential harm (orthostasis, falls, and adverse outcomes in CAD with low diastolic BP)</li> <li>Reduce or discontinue amlodipine</li> <li>Alternative therapy preferred based on compelling indications—lisinopril (diabetes) or beta-blocker (CAD)</li> </ul>




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Assess: Mrs. Roberts' Medications and Conditions  
(Not in Film)

Condition	Medication	Potential MRP	Potential Actions/Comments
Glaucoma	Timolol eye drops	Nonadherence	Counsel on proper use




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Assess: Mrs. Roberts' Medications and Conditions (Not in Film)			
Condition	Medication	Potential MRP	Potential Actions/Comments
Dizziness	Meclizine	<ul style="list-style-type: none"> <li>Adverse drug event</li> <li>Ineffective medication</li> </ul>	<ul style="list-style-type: none"> <li>Highly anticholinergic (e.g., dry mouth, constipation, confusion) (AGS, 2015)</li> <li>"Possibly effective" for disease affecting the vestibular system (Pflizer, 2012)</li> </ul>
Constipation	N/A	<ul style="list-style-type: none"> <li>Untreated condition</li> </ul>	<ul style="list-style-type: none"> <li>Discontinue diphenhydramine, meclizine, and reduce dose of mirtazapine</li> <li>Initiate laxative, other than docusate (ACU, 2009; Tansini et al., 2013)</li> </ul>




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Expert Interview: Michael Koronkowski, PharmD, CGP Medication Review
<p><b>Listen to Our Expert Discuss:</b></p> <ul style="list-style-type: none"> <li>Medication review</li> <li>Deprescribe and optimize medications               <ul style="list-style-type: none"> <li>Interprofessional approach</li> </ul> </li> </ul>




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Summary and Take-Home Points
<ul style="list-style-type: none"> <li>When caring for older adult patients with multiple comorbidities and complex health needs, the learner should recognize that:           <ul style="list-style-type: none"> <li>Medication management is a comprehensive process involving a thorough patient interview, an in-depth assessment of medication therapy, and an individualized care plan to resolve identified medication-related problems</li> <li>An accurate medication list must be compiled, as well as the patient's goals, preferences, and adherence assessed, before an attempt can be made to optimize medication therapy</li> <li>Matching each drug to a medical indication can assist the clinician in identifying common medication-related problems, including unnecessary medication and undertreated conditions</li> </ul> </li> </ul>




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