

Medication Safety across the Lifespan

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Medication Safety Across the Lifespan

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Learning Objectives

Identify	Define	Apply
Identify strategies to prevent medication-related problems in older adults.	Define the role of healthcare professionals and team members as partners in resolving medication-related problems and improving medication safety.	Apply the strategies for preventing medication-related problems on Case Studies

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Keep In mind...

Intermezzo Video
<http://www.youtube.com/watch?v=a5HTLcAOx38>

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Medication side effects should be considered immediately if an older adult experiences *any new* onset of symptoms.

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Geriatric Syndromes

Clinical conditions in older persons that do not fit into exact disease categories

Geriatric syndromes include:

- Delirium
- Falls
- Frailty
- Dizziness
- Fainting or temporary loss of consciousness
- Urinary incontinence

Inouye SK, Studenski S, Tinetti ME, Kuchel GA. JAGS 2007;55:780-791

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The Body and Medications

Our bodies experience physical changes as we age.

These changes can impact:

- how well medications get into and out of the body.
- how the body responds to medications.

Stattum PW, Peron EP, Ogbonna K. The Pharmacology of Aging. In: Filitt HM, MD, Rockwood K, Woodhouse K (eds). Brocklehurst's Textbook of Geriatric Medicine and Gerontology. Saunders Elsevier, 2016.

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Changes in Body Composition with Aging

Body fat increases and body water decreases as a percent of body weight.

Example: Alcoholic beverages

- Alcohol goes into body water.
- With less water, blood alcohol concentrations are higher.

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Changes in the Kidney and Liver with Aging

Most drugs leave the body through the liver and kidney.

- Liver and kidney function decline with aging.
- Drugs take longer to get out of the body.

Older adults may need lower doses or a longer time between doses.

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Changes in Drug Response with Aging

Older adults may:

- have decreased functional ability before taking the medication.
- be more sensitive to medications.
- be less able to compensate for the effects of medications.

This may result in unwanted side-effects of medications.

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What is a Medication-Related Problem ?

An undesirable event experienced by an individual that involves (or is suspected to involve) drug therapy and actually (or potentially) interferes with the desired health outcome.

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Risk Factors for Medication-Related Problems

- More than 6 current medical diagnoses
- More than 12 doses of medications per day
- 9 or more total medications
- History of adverse drug reactions in the past
- Low body weight
- Age > 85 years
- Low kidney function

Fouts M, et al. Consult Pharm 1997;12:1103-11

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Other Factors Contributing to Medication-Related Problems in Older Adults

- Incorrect drug or dose
- Non-adherence to the drug regimen
- Changes in the body that occur with aging
- Multiple prescribers
- Limited evidence base
- Limited health professional expertise in aging

Hajjar ER, et al. Am J Geriatr Pharmacother 2003;1:82-9

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Symptoms of a Medication-Related Problem in Older Adults

			
Altered mental status/confusion	Fatigue	Falling	
			
Constipation	Blurred vision	Depression	Dizziness

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Types of Medication-Related Problems

Inappropriate Prescribing	Overuse
Underuse	Adverse Drug Events
Drug Interactions	Non-adherence

www.merckmanuals.com/professional/sec23/ch341/ch341e.html

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Defined as:

- Prescribing of medications where the potential risk outweighs the potential benefit
- Prescribing that does not agree with accepted medical standards

Inappropriate Prescribing for Older Adults

Hanlon JT et al. JAGS 2001; 49:200-209

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- List of drugs to avoid in older adults
 - Ex: Updated Beers criteria (https://qioprogram.org/sites/default/files/2019BeersCriteria_JAGS.pdf)
- Medication regimen review to identify potentially inappropriate prescribing.

Inappropriate Prescribing for Older Adults

American Geriatrics Society. Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, 2019

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DA is an 89 year old female who has been taking diphenhydramine and acetaminophen (Tylenol PM®) for the past 5 months for arthritis pain at night. The pharmacist conducts a medication review and recommends that the order be changed to acetaminophen alone, since diphenhydramine is on the Beer's list. Diphenhydramine is not effective as a sedative with long term use and can cause side effects such as constipation, dry mouth and confusion. Diphenhydramine is not recommended for use in older adults. DA tells you that she does not want to change her medication and does not think the new medication will work.

What can you do as a staff or care team member to encourage the resident?

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Overuse of Medication

Polypharmacy defined as:

- Concurrent use of multiple medications
- Administration of more medications than are needed

Hanson JT et al. JAGS 2001; 49:200-209

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Overuse of Medication

Overuse can also occur when:

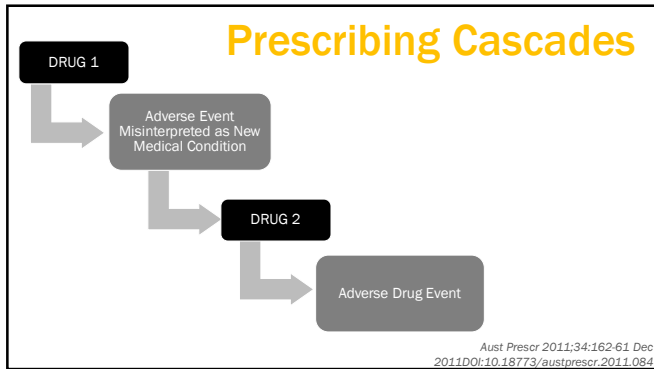
- Doses are too high
- Unintentional duplicate therapies are prescribed
 - Two drugs of the same class are prescribed for high blood pressure
 - Two medications prescribed for sleep by different doctors

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JL is an 84 year old male neighbor who complains of difficulty sleeping at night. He takes a medication for sleep, but still complains that he cannot fall asleep occasionally. He tells you that when he returned from his doctor's appointment earlier in the week, he had a new prescription for a medication for sleep. For the last three days, he has been very groggy in the morning and unsteady on his feet.

Can you think of a suggestion to help prevent this from occurring?

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Underuse of Medications

The omission of drug therapy that is needed for the treatment or prevention of a disease or condition.

Examples:

- Poor pain management
- Vitamin D for osteoporosis

Hanlon JT et al. JAGS 2001;49:200-9; Lipton HL et al. Ann Rev Gerontol Ger 1992; 12:95-108; Simon SR, Gurwitz JH. Clin Pharmacol Ther 2003;73:287-93; Chouinard L et al. Drugs Aging 2014;30:163-176

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Adverse Drug Events

- Unwanted effects of medications or "side effects"
- More common in older adults
- May be mistaken for "normal" aging or new medical conditions
- Can occur when first starting a new medication or after taking a medication for a long time.

Hanlon JT et al. JAGS 2001; 49:200-209

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"Anticholinergic" Side Effects

Dry Mouth	Difficulty Urinating
Constipation	Confusion/Delirium
Rapid Heart Rate	Memory Impairment
Blurred Vision	Dizziness

The Beers criteria contains a list of anticholinergic medications.

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Pay Close Attention to High Risk Drugs

Medication use leading to ER visits

 **33%**
are due to warfarin, insulin and digoxin

Emergency hospitalization due to adverse drug events

 **50%**
among those are ≥ 80 years

 **66%**
due to warfarin, insulin, antiplatelet agents and oral hypoglycemic agents

Ann Intern Med. 2007;147:755-765;
N Engl J Med 2011;365:2002-12

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Drug Allergies

- An allergy is an "overreaction" by the body's immune system to a foreign substance, such as a drug.
- Less than 10% of adverse drug events are drug allergies.
- Reactions can range from a mild skin rash to a life-threatening emergency (usually difficulty breathing).

It is very important to recognize drug allergies!

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Drug-Drug Interactions



Patient groups at increased risk:

- Older adults taking more than one drug
- Those seeing more than one doctor
- Those being infrequently or inadequately monitored
- Those with impaired liver or kidney function

Warfarin (Coumadin®) is a high-risk medication for drug interactions.

Dietary supplements, herbal products and over-the-counter medications must also be considered.

Pharmacists look for drug interactions when filling prescriptions.

Mallet L, et al. *Lancet* 2007;370:185-91.
<http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/ucm096391.pdf>

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Drug-Alcohol Interactions



Mixing certain medications with alcohol can cause adverse events

- Mixing alcohol with sedatives, pain medications or other drugs acting on the brain can result in increased sedation, unsteadiness or falls.
- Mixing alcohol with aspirin, ibuprofen, naproxen or similar drugs can increase risk of gastrointestinal bleeding.
- Mixing alcohol with blood pressure lowering medications can cause blood pressure to go too low.

Stattum PW, Hassan O. Medication, Alcohol and Aging. In: Kuerbis A, Moore AA, Sacco P, Zarjani F (eds.), *Alcohol and Aging: A Textbook of Clinical and Public Health Epidemiology*. Springer 2017.

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BA is a 93 year old male who is a new resident to the assisted living facility. He takes 12 medications, including one for "anxiety"—lorazepam (Ativan®). BA is seeing a new doctor since his move to the ALF and he asks the doctor for a prescription for a glass of wine with dinner each evening because others he eats with are having a glass of wine with their dinner. BA takes lorazepam at dinner time as well. BA has experienced two falls in the dining room after dinner after mixing alcohol and lorazepam.

What can you do in this case?

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Drug-Food Interactions

- Foods high in Vitamin K can interfere with blood thinners (e.g., warfarin).
- High fiber meals can decrease the absorption of some drugs (e.g., digoxin, lovastatin, penicillin, metformin).
- High protein meals can also decrease the absorption of some drugs (e.g., levodopa, carbidopa).
- High protein meals may accelerate the metabolism of some drugs (e.g., theophylline - a medication sometimes used to treat COPD).
- Foods high in tyramines can inhibit the absorption of antidepressants (MAOIs).
- Grapefruit juice impairs the absorption of certain drugs (e.g., antiarrhythmics, antidepressants, anti-hypertensives, immunosuppressants, statins, anti-seizure medications) by interfering with enzymes in the digestive system.

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Drug-Food Interactions

- Medications are best taken with water.
- Acidic fruit juices, vegetable juices, carbonated beverages and caffeinated beverages can inhibit the absorption of some drugs.
- Not taking enough fluids with medications can also delay drug dissolution and absorption.
- Milk and products containing calcium can complex with some drugs particularly fluoroquinolones (e.g. ciprofloxacin or norfloxacin). Medication should be taken one hour before or two hours after ingestion of milk products.
- Osteoporosis medications (e.g., Fosomax or Boniva) should be taken with water only as other beverages (e.g., tea, fruit juice, coffee, soda) can decrease the absorption of these drugs into the body.

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A Word about Adherence

- Taking medications as prescribed is important!
- The timing of administration of some medications is particularly critical.
 - Ex: Parkinson's medications, insulin
- Proper administration technique for inhalers, eye drops and other dosage forms is necessary for the resident to gain full benefit from the medication.

Vik SA et al. Ann Pharmacother 2004;38:303-12.
McLaughlin et al. Drug Aging 2005;22:231-255.

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Refusing Medications

- Individuals have the right to refuse medications.
- Important to document refusal.
- Adverse events can occur when some medications are stopped abruptly.
 - Ex: Very high blood pressure after stopping beta blockers such as metoprolol.
- When an individual frequently refuses medications, the pharmacist or other licensed professional can address this with the doctor through the medication review.

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The 5 Rights of Medication Administration

- Right Person or Resident
- Right Time
- Right Medication
- Right Dose
- Right Route

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Crushing Medications

Some individuals have difficulty swallowing tablets and capsules.

Do not crush medications or hide them in food unless the medication is ordered to be administered this way.

Crushing certain medications in sustained-release dosage forms can result in adverse events because all of the medication comes out at once rather than throughout the day.

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Crushing Medications

- Some medications are less effective if crushed or mixed with food, milk or juice.
- Some medications taste bad when crushed.
- Some medications may be harmful to the individual crushing them if the particles are accidentally inhaled.
- The pharmacist or prescriber can help to identify liquid or other dosage forms that can be more easily swallowed if necessary.

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Timing of Medication Administration

There are some medications where timing is particularly critical:

- Insulin
- Medications for Parkinson's disease
- Pain medications
- Sleep medications
- Osteoporosis medications
 - Alendronate (Fosamax®)
 - Risedronate (Actonel®)
 - Ibandronate (Boniva®)
 - Pamidronate (Aredia®)

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As Needed Medications

- The use of PRN (as needed) medications is prohibited in licensed facilities, unless one or more of the following conditions exist:
 - The individual is capable of determining when the medication is needed;
 - Licensed health care professionals are responsible for medication administration and management;

OR

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As Needed Medications

Documentation of "as needed" medication use is very important!


- o To avoid excessive dosing of as needed medications
- o To comply with state regulations
- o For evaluation during drug regimen review

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Controlled Substances

 Carefully follow all policies and procedures related to storage and administration of controlled substances in the facility.

 Accurate documentation is important.

 Report any discrepancies immediately.

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Discontinuing Medications

When a prescriber discontinues a medication:

- Observe resident for any possible adverse effects
 - o Some medications can cause a withdrawal syndrome as the body gets used to not having the drug anymore.
 - o Symptoms that the medication was prescribed to treat may return.

When an individual refuses to continue to take a medication:

- Observe individual for any possible adverse effects, since some medications should not be stopped abruptly.

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Transitions of Care

- Transitions of care occur when individuals move into a facility from home or return to the facility from a nursing home or hospital.
- This is a high-risk time for MRP's to occur.
- Good communication is key to avoiding problems.
- Be sure that a copy of the medication administration record (MAR) goes with the resident when they transfer settings.

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BB is a 90 year old male who recently returned to his home from a one week hospitalization. There are many changes in his medications. He received insulin before hospitalization, but currently has no orders to receive insulin. Several days after arriving back home, BB seems to be very tired and weak and complains of being thirsty.

What may have happened to be causing this effect during this transition from hospital to home?

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Reporting/Recording Errors

- Medication administration errors and omissions should be documented on the MAR or other appropriate record.
- Dispensing errors should be documented and reported to the pharmacy.
- If unsure about whether an error may have occurred, ask!
- By openly discussing errors and "near misses" we can improve our systems and better take care of our residents.



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Herbal Products and Other Dietary Supplements

-  Herbal products and dietary supplements should be treated like other medications.
-  They can have side effects and interact with prescription medications.
-  We should all be encouraged to discuss dietary supplement use with our prescribers.



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Preventing Medication-Related Problems

-  Observe individual for changes. Symptoms may be due to medication-related problems.
-  Pay particular attention when new medications are added or medications are discontinued.

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Preventing Medication-Related Problems

-  Encourage residents and their family caregivers to discuss medications with their prescribers.
-  Ensure that residents take a copy of their MAR or medication record to all physician and dentist office visits, ER visits and hospital admissions.

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Working with the Pharmacist

- Information about medications and possible adverse effects
- Screening for drug interactions
- Adherence devices for residents managing their own medications.
- Options for obtaining refills
- Coordination among health providers
- Options if have difficulty swallowing pills



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Additional Resources



<http://bemedwise.org/>



<https://www.fda.gov/drugs/resourcesforyou/consumers/tipsforseniors/default.htm>



<http://medsandaging.com/>



<https://www.hazeldenbettyford.org/treatment/models/specialized-programs/older-adults>



<http://www.ismp.org/>

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