

Medication Use in Older Adults: Keeping it real, safe, and effective

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Session Objectives

Discuss key challenges associated with use of medicines in older adults

Review important age-related physiologic changes that may impact medication use

List symptoms that may indicate a medicine-related problem

Screen for potential medicine-related problems and consider strategies to optimize safety, including triage or referral needs, given a case scenario

Test your knowledge

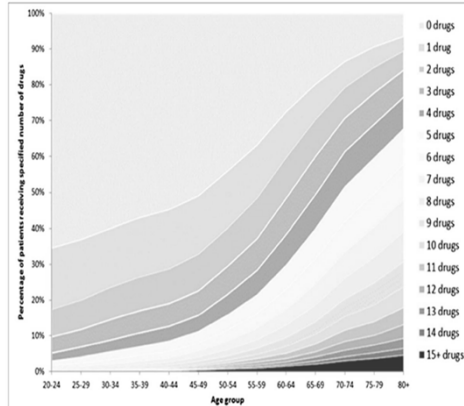
1. The main reason that older adults require lower doses of medicines is an age-related decline in kidney function.
 - a) True
 - b) False
2. Older adults are more sensitive to most medicines than when they were younger.
 - a) True
 - b) False
3. With increasing number of medicines, the risk also increases for?
 - a) Drug interactions
 - b) Adverse drug events/reactions
 - c) Adherence challenges
 - d) All of the above
4. The "prescribing cascade" occurs when a medicine is added to a regimen to treat the side effects of another.
 - a) True
 - b) False
5. Older adults are at greatest risk of falling due to their blood pressure medicine if:
 - a) They are dehydrated
 - b) They stand up too quickly
 - c) Their dose is too high
 - d) All of the above

Principle #1

In general, we are more likely to take medications as we get older than when we were younger

Older Adults are the Highest Consumers of Medication

2010



- 90% people 65+ report using ≥ 1 prescription drug in the prior 30 days
 - 40% took ≥ 5 or more meds
 - 1/5 take 10 or more
- 42% take at least 1 OTC
- 49% take at least 1 supplement

Guthrie et al. BMC Medicine 2015;13:74. National Center for Health Statistics. Health, US 2013: With Special Feature on Prescription Drugs. Hyattsville, MD. 2014, available at CDC.gov

Most Common Medications Used by Older Adults

Table 3. Weighted Prevalence Estimates of the Most Commonly Used Prescription and Over-the-Counter (OTC) Medications and Dietary Supplements Among US Older Adults

Variable	Estimated Prevalence, % (95% CI)		P Value ^a
	2005-2006 (n = 2351)	2010-2011 (n = 2206)	
Prescription and OTC medications			
Aspirin OTC ^b	30.2 (27.4-33.1)	40.2 (37.7-42.8)	<.001
Simvastatin ^c	10.3 (9.0-11.7)	22.5 (20.4-24.9)	<.001
Lisinopril	12.9 (11.3-14.8)	19.9 (17.7-22.4)	<.001
Hydrochlorothiazide	17.1 (14.9-19.5)	19.3 (16.8-22.0)	.06
Levothyroxine sodium	14.3 (12.6-16.3)	15.4 (13.7-17.2)	.86
Metoprolol	11.7 (10.1-13.6)	14.9 (12.9-17.3)	.02
Amlodipine ^c	8.5 (7.5-9.7)	13.4 (11.6-15.5)	.001
Metformin	9.3 (8.0-10.7)	12.6 (11.3-14.2)	<.001
Omeprazole OTC ^b	8.2 (7.1-9.4)	14.2 (12.6-16.1)	<.001
Atorvastatin calcium	13.8 (11.9-16.0)	9.7 (8.4-11.2)	<.001

What is the concern?

Taking multiple medicines increases the risk for

- Side effects
- Drug interactions
- Self-management difficulties

Goal: Fewest medicines possible – optimize non-drug therapies to minimize risks.

Principle #2

Older adults are heterogeneous in health care needs- individualize care, taking into account their preferences and goals

Tailoring therapy as a person ages

Example: A 65 year old woman with hypertension

Age	65 y	75 y	85 y
Comorbidities	Hypertension	Hypertension Osteoarthritis	Hypertension Osteoarthritis Dementia
Functional Status (ADLs)	Independent	Difficulty with 2 ADLs • walking & getting out of chair	Difficulty with 6 ADLs
Goals of care	Prevent stroke/MI	Prevent stroke/MI	Palliative
BP goal	<130/90	Individualized <140-150/90 (has occasional hypotension/falls)	Even less aggressive
BP meds	3 medications	2 medications	?

Considerations for Drug Therapy in Frail Elderly

- Remaining life expectancy
- Time until benefit
 - Some medications for secondary prevention require ~2 years before benefit expected.
- Goals of care
 - Prevention vs. cure vs. palliation
- Treatment targets
 - Aggressiveness of therapy (BP, A1c)

Holmes et al. Arch Intern Med 2006;166:605.

Weighing the benefit to risk

<i>Physiologic Parameter</i>	<i>Lag Time to see benefit of tx</i>	<i>Outcome</i>	<i>Risk of Tx</i>
Lipids	2-3 years	Reduced stroke and MI morbidity and mortality	Minor? Major?
Blood pressure	2-3 years	Reduced stroke and MI morbidity and mortality	Minor? Major?
Blood glucose	~8 years	Reduced macro & micro vascular disease	Minor? Major?

Principle #3

Adverse drug reaction (ADR) risks increase with aging

- health care utilization
- health consequences can be significant
 - functional decline

ADRs and Functional Decline

- SR, a 75 year old active female, visits her PCP with a 1 month history of sleep complaints. She “just can’t fall asleep at night” and would like something to help. Her PCP prescribes zolpidem 10 mg at bedtime as needed.
- 1 week later, SR is rushed to the ED after suffering a fall. X-ray reveals a the right femur fracture. She tolerates the surgery well, but she has poor endurance with therapeutic exercises and is sent to a skilled nursing facility.
- **1yr later, she still requires use of a walker**

What drugs are most likely to cause ADRs that lead to ED Visits?

- Four medications or med classes were implicated alone or in combination in 67% of ED visits:
 - Warfarin (33%)
 - Insulins (14%)
 - Oral antiplatelet agents (13%)
 - Oral hypoglycemic agents (11%)

N Engl J Med 2011;365:2002-12; JAMA 2016;316:2115-2125

Principle #4

Some medicines cause effects that might be perceived as a normal part of aging

- Falls & fractures
- Poor memory & confusion
- Urinary incontinence
- Constipation



Medications that May Increase Risk of Falls

- **Consistent evidence**
 - Benzodiazepines/other sleep medications
 - Antidepressants
 - Antipsychotics
 - Narcotics
 - Anticholinergics
- **Caution with**
 - Cardiovascular agents
 - thiazides, antiarrhythmics, digoxin

How do Medications Increase Risk for Falls?

- **Sensory changes**
 - Blurred vision
- **Cardiovascular effects**
 - Orthostatic hypotension
- **Neurological effects**
 - Sedation
 - Reduce alertness or central processing
 - Cognitive impairment
 - Parkinsonism--stiffness in limbs, affects gait and balance

Drugs that may cause cognitive impairment

- | Major culprits | Others |
|--|---|
| <ul style="list-style-type: none">• Benzodiazepines• Analgesics• Anticholinergics• Antipsychotics• Antidepressants | <ul style="list-style-type: none">• Drugs causing electrolyte imbalances• Certain cardiovascular agents<ul style="list-style-type: none">– reserpine– clonidine• Corticosteroids |

Principle #5

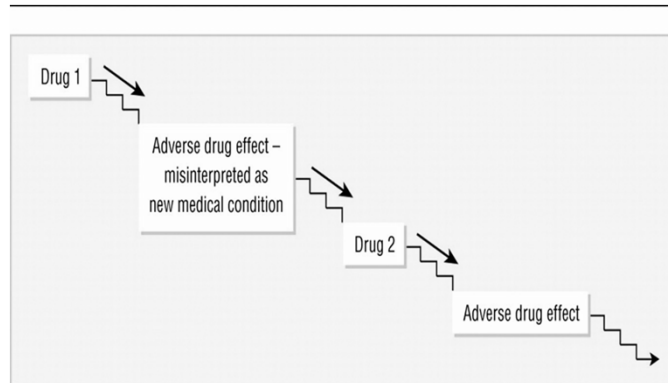
The more conditions you have,
the more medications you may be
prescribed

How many medicines are too many?



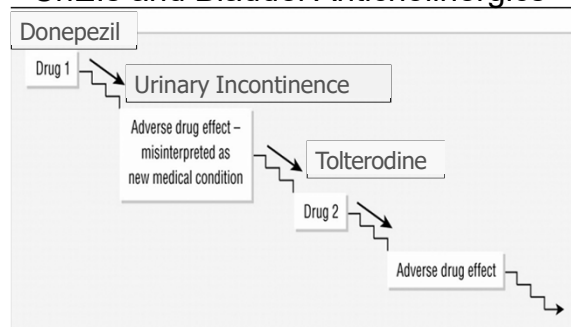
Prevent the Prescribing Cascade:

Avoid treating an ADR with another medication!



BMJ 1997;315:1096-1099

Example of the Prescribing Cascade ChEIs and Bladder Anticholinergics



ChEI use associated with a \uparrow 55% likelihood of starting a new bladder anticholinergic

Gill et al. Arch Intern Med 2005;165:808-813. Rochon et al. *BMJ* 1997;315:1096-1099.

You are caring for Emma, a 75 yo female.
Is she on too many medicines?

ARE ALL CONDITIONS
ADEQUATELY TREATED?

Medical Problems

- Heart Failure (s/p MI x7 years)
- CAD
- Osteoporosis
- Type 2 diabetes mellitus
- Pain in back due to spinal
compression fracture 4 months
ago

ANY MEDS NOT MATCHED TO A
CONDITION?

Medicines

- Lisinopril (Zestril™)
- Metoprolol (Toprol™)
- Furosemide (Lasix™)
- Aspirin
- Atorvastatin (Lipitor™)
- calcium carbonate
- vitamin D
- Alendronate (Fosamax™)
- Glipizide (Glucotrol XL™)
- Metformin (Glucophage™)
- Glucosamine/chondroitin

Principle #6

The greater number or more often
meds are taken each day, the
greater challenge to self-
management

Confirm self-management capability

Understanding?

- Purpose for each medication
- How to take each medication & potential concerns

Ability?

- Able to read the prescription label/instructions?
- Key challenges: splitting, injecting, mixing, or applying
- Swallowing pills (evaluation important post-stroke)

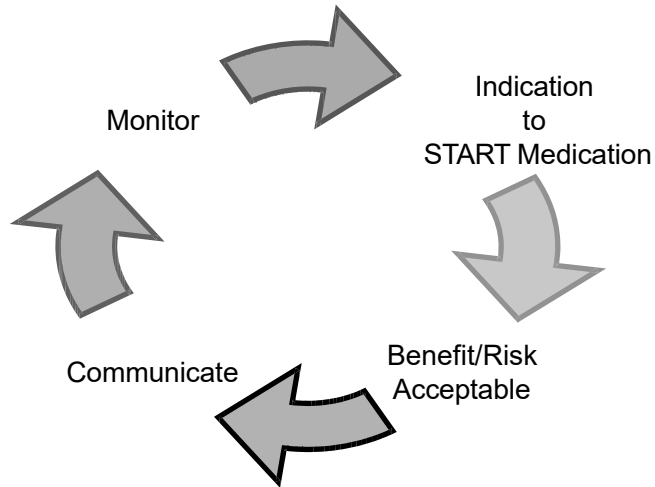
Plan for adherence?

- Dosing strategies – eg, with ADLs/IADLs
- Use a pill organizer, blister pack, or “bingo card”
- Order refills?

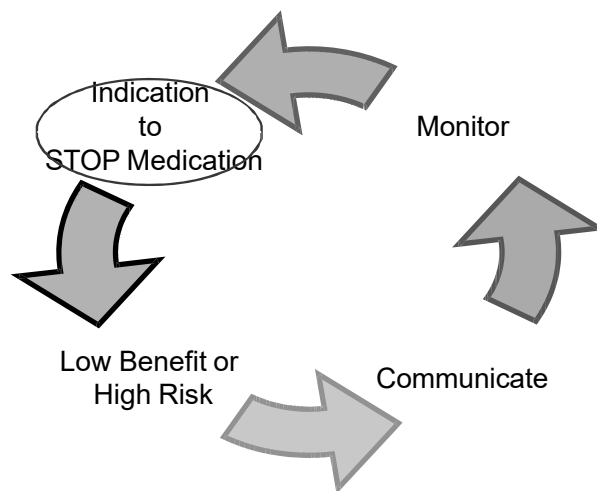
Consider if deprescribing is needed

- The systematic process of identifying and discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits within the context of an individual patient’s care goals, current level of functioning, life expectancy, values, and preferences.

The Prescribing Stage



The “DE”-Prescribing Stage



Deprescribing

- Part of the good prescribing continuum
- NOT about denying effective treatment to eligible patients
- Positive, patient-centered intervention, with inherent uncertainties
- Requires shared decision-making, informed patient consent, and close monitoring of effects

Scott IA et al. *JAMA Intern Med.* 2015;175:827-34.

Case

- A 75 year-old woman attends the clinic today complaining of nausea. She first noticed the symptoms 3-4 days ago. She is accompanied by her daughter who reports that her mother has been somewhat confused over the past few days.
- **PMH:** atrial fibrillation, memory problems, hypertension, urinary incontinence, insomnia, and history of falls.

Medications

Warfarin 2.5 mg mon, wed, fri; 5 mg other days
Digoxin 0.125 mg daily (reduced from 0.25 one month ago)
Aspirin 81 mg daily
Lotensin 20 mg daily
Oxybutynin 2.5 mg TID
Temazepam 15 mg at bedtime
Advil PM at bedtime
Omeprazole 20 mg 30 minutes before breakfast

eGFR (from visit 1 month ago) was 45 ml/min

Principle #7

To treat or not to treat:
Treat with intent, if treating

To Treat or Not to Treat

Untreatment:

- 50% of older adults were not prescribed an indicated medication

Undertreatment:

- “start low and go slow”...but do go, for geriatric dosing
- Example:
 - A good thing:
 - metformin 250 mg daily initially for diabetes, to minimize stomach upset, then worked up slowly to treatment effect
 - A bad thing:
 - Metformin 250 mg daily a year later
 - due to loss to follow-up or clinical inertia?
 - Result: no improvement in diabetes control ☹

Higashi T et al. Ann Intern Med 2004;140:714-20

Principle #8

First, do no harm

Identify any overdosing concerns...

Potential clues

- Drugged, dopey, dizzy, or confused
- Dose seems unusually high
 - Doses are generally lower for most medicines when used in older adults
- Dose has been the same for many years
 - The body often needs less medicine to get the same effect when older due to physiologic changes or increased sensitivity to medications

If you have a concern, alert the right member of the medical team

Important Physiologic Considerations

Distribution:

- Older bodies have a greater % fat versus lean tissue
- Drugs that soak into the fat can last much longer (e.g. Valium)
- Drugs that stay in the body water (lean tissue) can build up to toxic levels more quickly (e.g. ethanol)

Kidneys:

- gradual decline in ability of kidneys to eliminate drugs or their metabolites
 - ~1% decline in kidney function (GFR) per year after age 50

Liver:

- some reduction in liver metabolism (inactivation) of drugs

Appropriateness is Key

Beers criteria

Three levels of recommendations

- Medications always to avoid
- Medications to avoid if have specific health condition (drug-disease interaction)
- Medications to use with caution

Updated 2019 (J Am Geriatr Soc 2019;67:674-694)

- Now includes strength of evidence and recommendation

Beers Criteria: Strong Recommendation against

Anticholinergics (includes antidepressants with high anticholinergic action such as amitriptyline or paroxetine)

Nitrofurantoin with CrCl <30 ml/min or long term

CV agents

- Alpha₁ blockers
- Antiarrhythmics
- Nifedipine immediate release
- Digoxin >0.125mg

Barbiturates

Sulfonylureas, long acting (e.g. glyburide)

Key medications that the aging body is more sensitive to include...

- Medications that can cause orthostatic hypotension
 - tricyclic antidepressants, antipsychotics, diuretics, vasodilators, ACE inhibitors
- Medications with CNS effects
 - benzodiazepines, narcotics, antipsychotics, anticholinergics, anesthesia
- Warfarin

Practical Tip: Start dose low and increase slowly (but increase all the way if needed!)

Principle #10

Pass the baton carefully and thoughtfully

Medication Reconciliation at Transitions of Care

At every transition...

The medication regimen should be reconciled

- Home to hospital or emergency room
- Hospital to rehab or LTC/ALF
- Rehab/LTC/ALF to home

Hospital/Discharge instructions→	Home Meds	Concern
Metoprolol 50 mg BID	Toprol XL 100 mg daily	Same drug
Vasotec 10 mg daily	enalapril10 mg daily	Same drug
Levothyroxine 100 mcg daily	Synthroid 88 mcg daily	Same drug, different doses
Sertraline 75 mg daily at bedtime	Ambien 5 mg HS for sleep	Wrong drug, perception that tx is for sleep versus depression

CARE

C: *Confirm Goals*

- Does the patient know the goal? Is the goal being met?

A: *Assess Needs*

- Patient concerns
 - Side effects or too many meds
- Duplication in therapy?
- ?? Home meds don't match up with hospital discharge meds
- Patient reports adherence challenge
- Needs education



R: *Report Concerns*

E: *Encourage the patient*



Helpful resources:

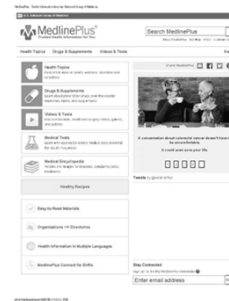
Health information and health screening

<http://www.nlm.nih.gov/medlineplus/>

AARP.org http://www.aarp.org/health/health_tools.htm

- Drug interactions
- Pill identifiers
- Drug information
- Symptom checker

A pharmacist 😊



Practice Cases

Case 1

Daphne is an 86 year old female with several medical conditions. She is taking:

- Advil™ 400 mg TID
- Naproxen 200 mg BID
- Benadryl™ 50 mg at bedtime
- Paroxetine 20 mg am
- Vicodin (5/300)™ 1 tablet QID
- Lantus™ insulin 10 units SC daily by syringe/vial
- Glipizide ½ of a 5 mg tablet daily

She reports concern about taking so many medicines. She is often so tired she prefers to just stay on the sofa. She often forgets meds – primarily the paroxetine

Concerns

- Chief complaint
 - too many meds and fatigue
- Potential Self-management Challenges
 - Difficulty drawing up insulin
 - Can't split glipizide
 - Forgets to take paroxetine
- *Actions*
 - *Consult with pharmacist or refer to PCP*

Considerations

- ADRs?
 - Vicodin™
 - Narcotics (hydrocodone) may cause CNS sedation and constipation
 - "Tylenol™" in doses above 3-4 gm daily may be toxic
 - Benadryl™
 - Risk of anticholinergic effects and drowsiness
 - NSAIDs are a primary cause of gastritis and PUD
 - Paroxetine
 - may cause drowsiness resulting in need to dose at night
- Therapeutic duplication?
 - Advil and Naproxen both are NSAIDs
 - Risk for GI bleed with either
 - Unnecessary extra meds
 - Advil, Naproxen, Vicodin™ all for pain

Case 2

Isabelle is a 92 year old woman who has had diabetes for 20 years and been on the same medicines for most of that time. Recently, she seems to be shaky all the time and you have had to call 911 twice in the last 3 months for her when she became quite confused due to a low blood glucose.

Meds:

- Glyburide 20 mg orally daily (diabetes)
- Metformin 1 gm orally twice daily (diabetes)
- Hydrochlorothiazide 25 mg daily (blood pressure)
- Docusate sodium 100 mg, two capsules daily

Labs: SMBG at home 53 mg/dL, recent A1c at health fair was 5.6%

Concerns

- Hypoglycemia due to glyburide. She may no longer need the glyburide given tight diabetes control and recurrent hypoglycemia
- *Actions: contact PCP or endocrinologist for assessment – initial assessment asap for safety and direction on continued med use.*

Case 3

Lester is an 83 year old man with high blood pressure. Today, he fell against the chair while rising. He is ok but has a bad abrasion on his arm and thigh. His blood pressure was 80/40 mmHg when you checked it and that is consistent with other checks this week.

Meds:

- HCTZ 25 mg daily
- Norvasc™ 10 mg daily
- Lisinopril 40 mg daily
- Metoprolol 50 mg twice daily
- Cozaar 50 mg daily
- Lipitor™ 20 mg daily
- Aspirin 81 mg daily

Concerns

- Hypotension-induced fall
 - Therapeutic duplication - on 5 medications with blood pressure lowering capability
- Opportunity to streamline his medication regimen to enhance QOL, self-management, and minimize ADR risks
- *Actions: Refer to urgent care or see PCP/Cardiologist asap for assessment of ongoing antihypertensive therapy*