Geriatric Psychopharmacology
Prescribing medications in the Elderly

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Objectives

- Polypharmacy
- Pharmacology and Aging
- Describe approach to starting and stopping medications
- Adverse Drug Events with case examples
- Inappropriate medications
- Discuss updated Beers criteria
- Preventing Adverse Drug Events

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Disclosures

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Polypharmacy

Taking how many drugs would put a person at risk of polypharmacy?

A. 2

B. 5

C. 10

D. A LOT?

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Polypharmacy

- The use of more than five medications, some of which may be clinically inappropriate.
- A more clinically useful definition is “the prescription, administration, or use of more medications than are clinically indicated”.

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Prevalence

- >80% of older adults use at least one prescription medication.
- >50% of Medicare users use five or more.
- >45% of prescription users also take at least one over-the- counter medication.
- >50% use at least one dietary supplement/herbal preparation.
- Prevalence increases with number of comorbidities, esp DM, CAD, CHF.

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Consequences

- The most common treatable illness in older adults is caused by Rx medications.
- Two thirds of admissions to an acute Geri unit are preceded by at least one inappropriate medication.
- Psychotropics are among the most common medications associated with adverse drug events (ADEs).
- Risk of ADEs increases with number of medications.
  - from 7% in those using 2 drugs to 50% in those using 5 drugs to 100% in those using >10 drugs. (Lin 2003, Brazeau 2001)
- Annual cost of 85 billion
- Geriatric “Syndromes”
  - Urinary Incontinence
  - Cognitive Impairment
  - Loss of balance leading to falls/fractures

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High Risk Populations

- **Renal impairment**
  - In one study, 40 percent of almost 10,000 older adults living in long-term care were found to have renal insufficiency
  - Start low, go slow
- **Patients in long-term care settings**
  - Polypharmacy is much more common
  - One large study reported an ADE rate of 9.8 per 100 resident–months
  - 42 percent of the ADEs were deemed preventable.
  - Neuropsychiatric events (confusion, oversedation, delirium), bleeding, and gastrointestinal events were common
- **Antipsychotics**
  - most frequently associated with adverse events in long-term care facilities
  - increased risk for falls (odds ratio 1.73)
  - FDA black box warning

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Pharmacokinetics

Pharmacokinetics is the analysis of the processes of absorption, distribution, metabolism, and excretion, factors that determine plasma levels and tissue concentrations of a drug.

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Pharmacokinetics in the elderly- absorption

- Decreased gastric emptying/ intestinal blood flow
  - Drugs that speed gastric emptying (e.g., metoclopramide)
  - Drugs that diminish intestinal motility (e.g., opiates or marijuana)
  - Antacids, charcoal may reduce absorption.
- Properties of the drug administered (e.g., tablet, capsule, or liquid, IR or XR)
- Local action of enzymes in the gastrointestinal tract

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Pharmacokinetics in the elderly-distribution

- Decreased plasma albumin
  - Fluoxetine, aripiprazole, and diazepam are highly protein-bound.
  - Venlafaxine, lithium, and memantine are less protein bound.
- What happens when a patient taking previously highly protein-bound drugs that have a low therapeutic index (warfarin) starts taking Depakote?
- Increased ratio of fat to lean mass
  - Greater accumulations of fat-soluble drugs (benzodiazepines, neuroleptics, and cyclic antidepressants)

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Pharmacokinetics in the elderly-metabolism

- Decreased hepatic metabolism
  - Phase I
  - Phase II (in frail elders)
  - Valproic acid and some benzodiazepines (i.e., lorazepam, oxazepam, and temazepam) undergo phase II reactions only

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Pharmacokinetics in the elderly-elimination

- Decreased GFR/creatinine clearance
  - Lithium, Gabapentin, Topiramate, Amantadine, Paliperidone, Rivastigmine
  - Many drugs commonly used in older adults decrease Lithium clearance.

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Pharmacodynamics in the elderly

- Reduced D1, D2, 5HT1A, 5HT2A receptors in the brain
- Decreased beta adrenergic response
- More sensitive to sedation
- Decreased baroreflex function/increased sensitivity to parasympathetic stimulation of CNS

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Approach to Prescribing

- **Establish Goals of Care**
  - Starts with the patient
- **Gather information about conditions and medications**
  - **Medication reconciliation is key!**
  - What is prescribed/what are they actually taking
  - Is the condition being treated still active?
- **Specific benefits and side effects**
  - Review risks vs benefits, general AND specific to the patient
  - Evidence for drug being used for that condition
  - Tools like STOPP/START or Beers criteria
  - Does time to benefit exceed life expectancy?
- **Make changes and review periodically**

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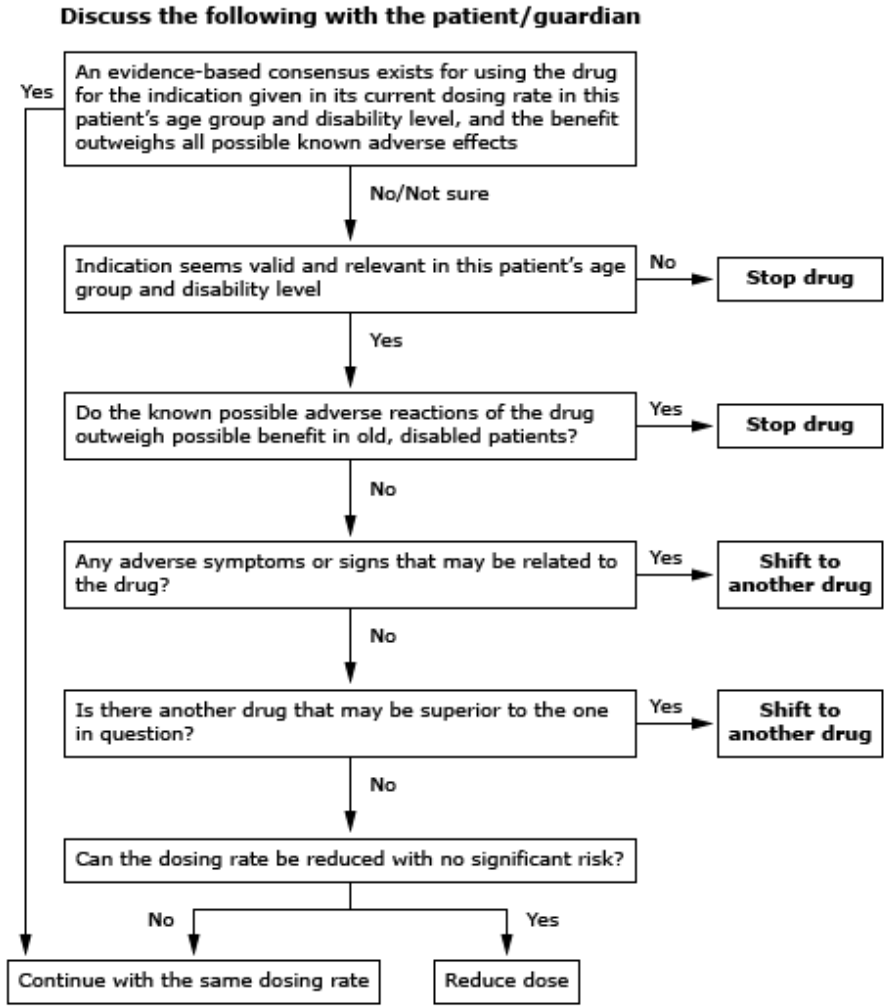
Medication review



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Adverse Drug Events

- More likely in older adults:
  - frailty, coexisting medical problems, memory issues, and polypharmacy
  - A meta-analysis found a fourfold increase in the rate of hospitalization related to ADEs in older adults compared with younger adults.
  - 88% of ADE hospitalizations among older adults were preventable.

– **Adverse drug events (ADEs) cause over 100,000 deaths per year in the United States, making ADEs the fourth leading cause of death in the United States** (JAMA 1998)

– 10.7% of hospital admissions in older adults are associated with adverse drug reactions (Ann Pharmacother 2008)

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Types of ADEs

- Hospitalization due to medication side effects
- Prescribing cascades
- Drug-drug interactions
- Dose related adverse drug events

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Drug	Potential Interaction with antidepressants
MAOIs	Serotonin syndrome
TCAs	Increased levels when combined with fluoxetine, paroxetine, sertraline, bupropion, duloxetine (2D6)
Antipsychotics (typical) and risperidone, aripiprazole	Increased antipsychotic levels with fluoxetine, sertraline, paroxetine, bupropion, duloxetine (2D6)
Clozapine and olanzapine	Increased antipsychotic levels with fluvoxamine (1A2)
Diazepam	Increased benzodiazepine levels with fluoxetine, fluvoxamine, sertraline (2C)
Carbamazepine	Increased carbamazepine levels with fluoxetine, fluvoxamine (3A4)
Type 1C antiarrhythmics (encainide, flecainide)	Increased antiarrhythmic levels with fluoxetine, paroxetine, sertraline, bupropion, duloxetine (2D6)
β-Blockers (lipophilic)	Increased β-blocker levels with fluoxetine, paroxetine, sertraline, bupropion, duloxetine (2D6)
Calcium channel blockers	Increased levels with fluoxetine, fluvoxamine (3A4)

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Case 1

- 86 year old wheelchair bound lady, lives at home with full time caregiver. Referred to us for depression and hallucinations. Patient appears sedated, apathetic, slumped over in wheelchair. Caregiver reports refusal to eat, complaints of nausea, gets agitated at night because she sees “something that scares her”. Patient denies any hallucinations, states she does not feel good, and wants to be left alone.
- Medications: Lisinopril, simvastatin, aspirin, ranitidine, amitriptyline, tylenol prn, recently started on low dose sertraline for the depression. Recent course of antibiotics for UTI.

- What kind of ADE would you suspect?
- Would you stop a medication? If so which one?

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Case 2

- 78 year old lady seen on the CL service for “dementia with behavioral disturbance- should antipsychotic be changed?”. Patient was brought from assisted living facility where staff reported increased aggression towards elderly husband and staff members. Patient seen in bed yelling out and trying to climb out of geri-bed- given prn trazodone, olanzapine changed to risperidone. Later that night patient climbs over the rails and sustains a fall.
- Medications: Metoprolol, metformin, donepezil, memantine, oxybutynin, olanzapine
- Diagnosed with dementia one year ago. Donepezil was started at that visit, memantine added 4 months later. Patient became progressively worse and developed incontinence, at which time oxybutynin was added. Her cognition continued to worsen and she developed hallucinations, for which olanzapine was prescribed.

- What do you think led to the fall?
- What could be the cause of her incontinence?

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Case 3

- 80 year old female with history of COPD, depression, minor neurocognitive disorder, overactive bladder, and insomnia seen in clinic for cognitive decline. Over the past six months, she has been more confused and family finds her occasionally disoriented. She agrees that her memory has seemed worse lately and also complains of dizziness, constipation and dry mouth. Her heart rate is mildly elevated but her physical exam is otherwise normal.
- Medications: She was recently started on Ditropan(oxybutynin) for overactive bladder. Otherwise taking Spiriva(tiotropium), Aricept (donepezil), Elavil(Amitripyline) , and a daily Aspirin. She also occasionally takes a Benadryl when she cannot sleep.

- What are some possible causes of the patient's recent symptoms?
- What else might the patient experience if left untreated?

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Case 4

- 79 year old female with history of generalized anxiety treated by her primary care doctor with Xanax(alprazolam) since the 1970s, currently taking 1-2mg two to three times daily. She is referred to geriatric psychiatry for evaluation of anxiety and cognitive decline where it is noted that she occasionally uses more Xanax than her PCP prescribes and that she has had three falls in the last month. Functionally, she remains quite independent including with driving.

- What are some of the short term and long term risks of this regimen?
- How would one go about stopping this medication?
- What are some safer alternatives?

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Beers Criteria

- Developed in 1991, frequently revised, most recently 2019
- List of *potentially* inappropriate drugs for older adults
- Lists medications to avoid or to prescribe with caution in older adults in general, in older adults with certain diseases, as well as drug-drug interactions and drugs requiring renal dosing
- **But prescribing drugs may be appropriate and can be unavoidable at times**

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Beers Criteria

- Intended to guide/improve medication choice for adults 65+
- Appropriate for ambulatory, acute, and institutionalized pts (NOT meant for palliative care or hospice)
- Other goals:
  - Education
  - Reducing adverse drug events
  - Evaluating quality of care
  - Costs
  - Prescribing patterns

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Beers Criteria

Development of criteria:

- Result of extensive literature search for “adverse drug events/reactions” in adults 65+ including all medications available in the US
- Only controlled clinical trials, observational studies, systematic reviews and meta-analyses
- Case reports, case series, letters to editor, editorials excluded

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Beers Criteria

Two designations:

- Quality of Evidence:
  - High → one or more well designed RCTs with consistent results
  - Moderate → RCTs w/ limitations or well designed case control studies
  - Low → observational studies, more research may change result

- Strength of Evidence:
  - Strong → Risks clearly outweigh benefits
  - Weak → Risks may not outweigh benefits

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Table 2. 2019 American Geriatrics Society Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults[a]

Organ System, Therapeutic Category, Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Anticholinergics[b]				
First-generation antihistamines Brompheniramine Carbinoxamine Chlorpheniramine Clemastine Cyproheptadine Dexbrompheniramine Dexchlorpheniramine Dimenhydrinate Diphenhydramine (oral) Doxylamine Hydroxyzine Meclizine Promethazine Pyrilamine Triprolidine	Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; risk of confusion, dry mouth, constipation, and other anticholinergic effects or toxicity Use of diphenhydramine in situations such as acute treatment of severe allergic reaction may be appropriate.	Avoid	Moderate	Strong
Antiparkinsonian agents Benztropine (oral) Trihexyphenidyl	Not recommended for prevention or treatment of extrapyramidal symptoms with antipsychotics; more effective agents available for treatment of Parkinson disease	Avoid	Moderate	Strong
Antispasmodics Atropine (excludes ophthalmic) Belladonna alkaloids Clidinium-chlordiazepoxide Dicyclomine Homatropine (excludes opthalmic) Hyoscyamine Methscopolamine Propantheline Scopolamine	Highly anticholinergic, uncertain effectiveness	Avoid	Moderate	Strong
Antithrombotics				
Dipyridamole, oral short acting (does not apply to the extended-release combination with aspirin)	May cause orthostatic hypotension; more effective alternatives available; IV form acceptable for use in cardiac stress testing	Avoid	Moderate	Strong
Anti-infective				
Nitrofurantoin	Potential for pulmonary toxicity, hepatoxicity, and peripheral neuropathy, especially with long-term use; safer alternatives available	Avoid in individuals with creatinine clearance <30 mL/min or for long-term suppression	Low	Strong
Cardiovascular				
Peripheral alpha-1 blockers for treatment of hypertension Doxazosin Prazosin Terazosin	High risk of orthostatic hypotension and associated harms, especially in older adults; not recommended as routine treatment for hypertension; alternative agents have superior risk/benefit profile	Avoid use as an antihypertensive	Moderate	Strong

Table 2 (Contd.)

Organ System, Therapeutic Category, Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Central alpha-agonists	High risk of adverse CNS effects; may cause bradycardia and orthostatic hypotension; not recommended as routine treatment for hypertension	Avoid as first-line antihypertensive	Low	Strong
Clonidine for first-line treatment of hypertension		Avoid other CNS alpha-agonists as listed	Low	Strong
Other CNS alpha-agonists Guanabenz Guanfacine Methyldopa Reserpine (>0.1 mg/day)				
Disopyramide	May induce heart failure in older adults because of potent negative inotropic action; strongly anticholinergic; other antiarrhythmic drugs preferred	Avoid	Low	Strong
Dronedarone	Worse outcomes have been reported in patients taking dronedarone who have permanent atrial fibrillation or severe or recently decompensated heart failure.	Avoid in individuals with permanent atrial fibrillation or severe or recently decompensated heart failure	High	Strong
Digoxin for first-line treatment of atrial fibrillation or of heart failure	Use in atrial fibrillation: should not be used as a first-line agent in atrial fibrillation, because there are safer and more effective alternatives for rate control supported by high-quality evidence. Use in heart failure: evidence for benefits and harms of digoxin is conflicting and of lower quality; most but not all of the evidence concerns use in HFrEF. There is strong evidence for other agents as first-line therapy to reduce hospitalizations and mortality in adults with HFrEF. In heart failure, higher dosages are not associated with additional benefit and may increase risk of toxicity. Decreased renal clearance of digoxin may lead to increased risk of toxic effects; further dose reduction may be necessary in those with stage 4 or 5 chronic kidney disease.	Avoid this rate control agent as first-line therapy for atrial fibrillation	Atrial fibrillation: low	Atrial fibrillation: strong
		Avoid as first-line therapy for heart failure	Heart failure: low	Heart failure: strong
		If used for atrial fibrillation or heart failure, avoid dosages >0.125 mg/day	Dosage >0.125 mg/day: moderate	Dosage >0.125 mg/day: strong
Nifedipine, immediate release	Potential for hypotension; risk of precipitating myocardial ischemia	Avoid	High	Strong
Amiodarone	Effective for maintaining sinus rhythm but has greater toxicities than other antiarrhythmics used in atrial fibrillation; may be reasonable first-line therapy in patients with concomitant heart failure or substantial left ventricular hypertrophy if rhythm control is preferred over rate control	Avoid as first-line therapy for atrial fibrillation unless patient has heart failure or substantial left ventricular hypertrophy	High	Strong
Central nervous system				
Antidepressants, alone or in combination Amitriptyline Amoxapine Clomipramine Desipramine Doxepin >6 mg/day Imipramine	Highly anticholinergic, sedating, and cause orthostatic hypotension; safety profile of low-dose doxepin (≤6 mg/day) comparable to that of placebo	Avoid	High	Strong

Table 2 (Contd.)

Organ System, Therapeutic Category, Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Nortriptyline Paroxetine Protriptyline Trimipramine				
Antipsychotics, first (conventional) and second (atypical) generation	Increased risk of cerebrovascular accident (stroke) and greater rate of cognitive decline and mortality in persons with dementia Avoid antipsychotics for behavioral problems of dementia or delirium unless nonpharmacological options (eg, behavioral interventions) have failed or are not possible *and* the older adult is threatening substantial harm to self or others	Avoid, except in schizophrenia or bipolar disorder, or for short-term use as antiemetic during chemotherapy	Moderate	Strong
Barbiturates Amobarbital Butabarbital Butalbital Mephobarbital Pentobarbital Phenobarbital Secobarbital	High rate of physical dependence, tolerance to sleep benefits, greater risk of overdose at low dosages	Avoid	High	Strong
Benzodiazepines *Short and intermediate acting:* Alprazolam Estazolam Lorazepam Oxazepam Temazepam Triazolam *Long acting:* Chlordiazepoxide (alone or in combination with amitriptyline or clidinium) Clonazepam Clorazepate Diazepam Flurazepam Quazepam	Older adults have increased sensitivity to benzodiazepines and decreased metabolism of long-acting agents; in general, all benzodiazepines increase risk of cognitive impairment, delirium, falls, fractures, and motor vehicle crashes in older adults May be appropriate for seizure disorders, rapid eye movement sleep behavior disorder, benzodiazepine withdrawal, ethanol withdrawal, severe generalized anxiety disorder, and periprocedural anesthesia	Avoid	Moderate	Strong
Meprobamate	High rate of physical dependence; sedating	Avoid	Moderate	Strong
Nonbenzodiazepine, benzodiazepine receptor agonist hypnotics (ie, "Z-drugs") Eszopiclone Zaleplon Zolpidem	Nonbenzodiazepine benzodiazepine receptor agonist hypnotics (ie, Z drugs) have adverse events similar to those of benzodiazepines in older adults (eg, delirium, falls, fractures); increased emergency room visits/ hospitalizations; motor vehicle crashes; minimal improvement in sleep latency and duration	Avoid	Moderate	Strong
Ergoloid mesylates (dehydrogenated ergot alkaloids) Isoxsuprine	Lack of efficacy	Avoid	High	Strong

Table 2 (Contd.)

Organ System, Therapeutic Category, Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Endocrine				
Androgens Methyltestosterone Testosterone	Potential for cardiac problems; contraindicated in men with prostate cancer	Avoid unless indicated for confirmed hypogonadism with clinical symptoms	Moderate	Weak
Desiccated thyroid	Concerns about cardiac effects; safer alternatives available	Avoid	Low	Strong
Estrogens with or without progestins	Evidence of carcinogenic potential (breast and endometrium); lack of cardioprotective effect and cognitive protection in older women	Avoid systemic estrogen (eg, oral and topical patch)	Oral and patch: high	Oral and patch: strong
	Evidence indicates that vaginal estrogens for the treatment of vaginal dryness are safe and effective; women with a history of breast cancer who do not respond to nonhormonal therapies are advised to discuss the risks and benefits of low-dose vaginal estrogen (dosages of estradiol <25 μg twice weekly) with their healthcare provider	Vaginal cream or vaginal tablets: acceptable to use low-dose intravaginal estrogen for management of dyspareunia, recurrent lower urinary tract infections, and other vaginal symptoms	Vaginal cream or vaginal tablets: moderate	Topical vaginal cream or tablets: weak
Growth hormone	Impact on body composition is small and associated with edema, arthralgia, carpal tunnel syndrome, gynecomastia, impaired fasting glucose	Avoid, except for patients rigorously diagnosed by evidence-based criteria with growth hormone deficiency due to an established etiology	High	Strong
Insulin, sliding scale (insulin regimens containing only short- or rapid-acting insulin dosed according to current blood glucose levels without concurrent use of basal or long-acting insulin)	Higher risk of hypoglycemia without improvement in hyperglycemia management regardless of care setting. Avoid insulin regimens that include only short- or rapid-acting insulin dosed according to current blood glucose levels without concurrent use of basal or long-acting insulin. This recommendation does not apply to regimens that contain basal insulin or long-acting insulin.	Avoid	Moderate	Strong
Megestrol	Minimal effect on weight; increases risk of thrombotic events and possibly death in older adults	Avoid	Moderate	Strong
Sulfonylureas, long acting Chlorpropamide Glimepiride Glyburide (also known as glibenclamide)	Chlorpropamide: prolonged half-life in older adults; can cause prolonged hypoglycemia; causes SIADH Glimepiride and glyburide: higher risk of severe prolonged hypoglycemia in older adults	Avoid	High	Strong
Gastrointestinal				
Metoclopramide	Can cause extrapyramidal effects, including tardive dyskinesia; risk may be greater in frail older adults and with prolonged exposure	Avoid, unless for gastroparesis with duration of use not to exceed 12 weeks except in rare cases	Moderate	Strong
Mineral oil, given orally	Potential for aspiration and adverse effects; safer alternatives available	Avoid	Moderate	Strong
Proton-pump inhibitors	Risk of *Clostridium difficile* infection and bone loss and fractures	Avoid scheduled use for >8 weeks unless for high-risk patients (eg, oral corticosteroids or chronic NSAID use), erosive esophagitis, Barrett esophagitis, pathological hypersecretory condition, or demonstrated need for maintenance treatment (eg, because of failure of drug discontinuation trial or H2-receptor antagonists)	High	Strong

Table 2 (Contd.)

Organ System, Therapeutic Category, Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Pain medications				
Meperidine	Oral analgesic not effective in dosages commonly used; may have higher risk of neurotoxicity, including delirium, than other opioids; safer alternatives available	Avoid	Moderate	Strong
Non–cyclooxygenase-selective NSAIDs, oral: Aspirin >325 mg/day Diclofenac Diflunisal Etodolac Fenoprofen Ibuprofen Ketoprofen Meclofenamate Mefenamic acid Meloxicam Nabumetone Naproxen Oxaprozin Piroxicam Sulindac Tolmetin	Increased risk of gastrointestinal bleeding or peptic ulcer disease in high-risk groups, including those >75 years or taking oral or parenteral corticosteroids, anticoagulants, or antiplatelet agents; use of proton-pump inhibitor or misoprostol reduces but does not eliminate risk. Upper gastrointestinal ulcers, gross bleeding, or perforation caused by NSAIDs occur in ~1% of patients treated for 3-6 months and in ~2%-4% of patients treated for 1 year; these trends continue with longer duration of use. Also can increase blood pressure and induce kidney injury. Risks are dose related.	Avoid chronic use, unless other alternatives are not effective and patient can take gastroprotective agent (proton-pump inhibitor or misoprostol)	Moderate	Strong
Indomethacin Ketorolac, includes parenteral	Increased risk of gastrointestinal bleeding/peptic ulcer disease and acute kidney injury in older adults Indomethacin is more likely than other NSAIDs to have adverse CNS effects. Of all the NSAIDs, indomethacin has the most adverse effects.	Avoid	Moderate	Strong
Skeletal muscle relaxants Carisoprodol Chlorzoxazone Cyclobenzaprine Metaxalone Methocarbamol Orphenadrine	Most muscle relaxants poorly tolerated by older adults because some have anticholinergic adverse effects, sedation, increased risk of fractures; effectiveness at dosages tolerated by older adults questionable	Avoid	Moderate	Strong
Genitourinary				
Desmopressin	High risk of hyponatremia; safer alternative treatments	Avoid for treatment of nocturia or nocturnal polyuria	Moderate	Strong

Beers Criteria: Psychiatric drugs

Psychiatric drugs to be used with caution in older adults

Antipsychotics Carbamazepine Diuretics Mirtazapine Oxcarbazepine SNRIs SSRIs TCAs Tramadol	May exacerbate or cause SIADH or hyponatremia; monitor sodium level closely when starting or changing dosages in older adults	Use with caution	Moderate	Strong

Psychiatric drug interactions to be avoided in older adults

Antidepressants (TCAs, SSRIs, and SNRIs) Antipsychotics Antiepileptics Benzodiazepines and nonbenzodiazepine, benzodiazepine receptor agonist hypnotics (ie, "Z-drugs") Opioids	Any combination of three or more of these CNS-active drugs[a]	Increased risk of falls (all) and of fracture (benzodiazepines and nonbenzodiazepine, benzodiazepine receptor agonist hypnotics)	Avoid total of three or more CNS-active drugs[a]; minimize number of CNS-active drugs	Combinations including benzodiazepines and nonbenzodiazepine, benzodiazepine receptor agonist hypnotics *or* opioids: high All other combinations: moderate	Strong
Lithium	ACEIs	Increased risk of lithium toxicity	Avoid; monitor lithium concentrations	Moderate	Strong
Lithium	Loop diuretics	Increased risk of lithium toxicity	Avoid; monitor lithium concentrations	Moderate	Strong

Psychiatric drugs to be avoided/lowered in renal impairment

Duloxetine	<30	Increased gastrointestinal adverse effects (nausea, diarrhea)	Avoid	Moderate	Weak

2019 Additions to Beers

- Do not use opioids with benzos or gabapentinoids
  - Risk of sedation, overdose, respiratory depression, death
- Avoid Bactrim + ACE inhibitors or ARB in setting of low CrCl
  - Risk of hyperkalemia
- Avoid H2-blockers in delirium (but no longer in dementia)
  - Risk of drug induced delirium, but evidence for link to dementia is weak

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2019 Additions to Beers

- Use caution with aspirin for primary prevention in those >70
  - Risk of bleeding
- Avoid SNRIs in patients with history of falls or fractures
  - Risk of additional falls
- Avoid sliding scale insulin unless also on long-acting/basal insulin
  - Risk of hypoglycemia

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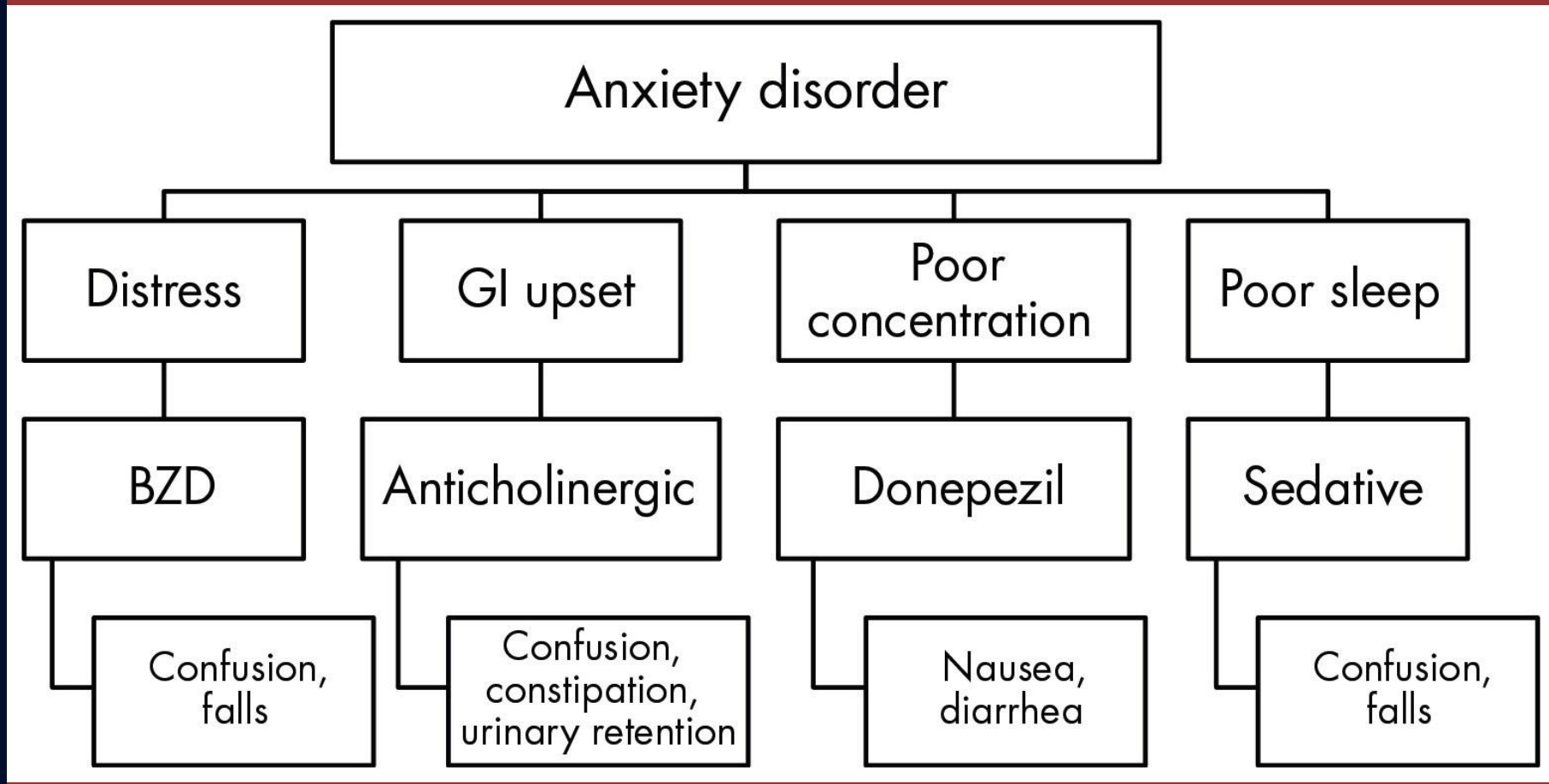
Beers Criteria



STOPP/START Criteria

- "Screening Tool of Older Persons' Prescriptions"
- "Screen Tool to Alert Doctors to Right Treatment"

- Developed in 2008 to encompass both potentially inappropriate medications (PIMs; STOPP) and potential prescribing omissions (PPOS; START)

- Intended to serve as an intervention within 72 of admission to inpt units

- Derived from literature search and expert opinion

- STOPP= 65 criteria; START=22. Updated in 2012 to include 114 criteria

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STOPP: Central Nervous System and Psychotropic Drugs

- 1. TriCyclic Antidepressants (TCAs) with dementia, narrow angle glaucoma, cardiac conduction abnormalities, prostatism, or prior history of urinary retention (risk of worsening these conditions).
- 2. Initiation of TriCyclic Antidepressants (TCAs) as first-line antidepressant treatment (higher risk of adverse drug reactions with TCAs than with SSRIs or SNRIs).
- 3. Neuroleptics with moderate-marked antimuscarinic/anticholinergic effects (chlorpromazine, clozapine, flupenthixol, fluphenzine, pipothiazine, promazine, zuclopenthixol) with a history of prostatism or previous urinary retention (high risk of urinary retention).
- 4. Selective serotonin re-uptake inhibitors (SSRI's) with current or recent significant hyponatraemia i.e. serum Na+ < 130 mmol/l (risk of exacerbating or precipitating hyponatraemia).
- 5. Benzodiazepines for ≥ 4 weeks (no indication for longer treatment; risk of prolonged sedation, confusion, impaired balance, falls, road traffic accidents; all benzodiazepines should be withdrawn gradually if taken for more than 4 weeks as there is a risk of causing a benzodiazepine withdrawal syndrome if stopped abruptly).
- 6. Antipsychotics (i.e. other than quetiapine or clozapine) in those with parkinsonism or Lewy Body Disease (risk of severe extra-pyramidal symptoms).
- 7. Anticholinergics/antimuscarinics to treat extra-pyramidal side-effects of neuroleptic medications (risk of anticholinergic toxicity),
- 8. Anticholinergics/antimuscarinics in patients with delirium or dementia (risk of exacerbation of cognitive impairment).
- 9. Neuroleptic antipsychotic in patients with behavioural and psychological symptoms of dementia (BPSD) unless symptoms are severe and other non-pharmacological treatments have failed (increased risk of stroke).
- 10. Neuroleptics as hypnotics, unless sleep disorder is due to psychosis or dementia (risk of confusion, hypotension, extra-pyramidal side effects, falls).
- 11. Acetylcholinesterase inhibitors with a known history of persistent bradycardia (< 60 beats/min.), heart block or recurrent unexplained syncope or concurrent treatment with drugs that reduce heart rate such as beta-blockers, digoxin, diltiazem, verapamil (risk of cardiac conduction failure, syncope and injury).
- 12. Phenothiazines as first-line treatment, since safer and more efficacious alternatives exist (phenothiazines are sedative, have significant anti-muscarinic toxicity in older people, with the exception of prochlorperazine for nausea/vomiting/vertigo, chlorpromazine for relief of persistent hiccoughs and levomepromazine as an anti-emetic in palliative care).
- 13. Levodopa or dopamine agonists for benign essential tremor (no evidence of efficacy) 14. First-generation antihistamines (safer, less toxic antihistamines now widely available).
- 14. First-generation antihistamines (safer, less toxic antihistamines now widely available).

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START: Central Nervous System

- 1. L-DOPA or a dopamine agonist in idiopathic Parkinson's disease with functional impairment and resultant disability.
- 2. Non-TCA antidepressant drug in the presence of persistent major depressive symptoms.
- 3. Acetylcholinesterase inhibitor (e.g. donepezil, rivastigmine, galantamine) for mildmoderate Alzheimer's dementia or Lewy Body dementia (rivastigmine).
- 4. Topical prostaglandin, prostamide or beta-blocker for primary open-angle glaucoma.
- 5. Selective serotonin reuptake inhibitor (or SNRI or pregabalin if SSRI contraindicated) for persistent severe anxiety that interferes with independent functioning.
- 6. Dopamine agonist (ropinirole or pramipexole or rotigotine) for Restless Legs Syndrome, once iron deficiency and severe renal failure have been excluded.

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Specific psychotropic drugs in the elderly

- **Mirtazapine**: sedation especially at low doses/dry mouth/QT prolongation, but otherwise good safety profiles and few drug-drug interactions
- **Trazodone**: sedation/dry mouth/orthostasis due to alpha 1 blockade/QT prolongation, but generally not anticholinergic
- **TCAs**: Orthostasis, anticholinergic se, cardiac conduction delays
- **Lower-potency antipsychotics**: more sedating, more anticholinergic, antihistaminic, and α_1-blocking effects
- **Higher-potency antipsychotics**: more EPS, including akathisia, dystonia, and parkinsonism.
- **Benzodiazepines**: Lorazepam, oxazepam, and temazepam are not subject to phase I metabolism, and therefore preferred in the elderly
  - Additive CNS depressant effects
- **Opioids**: problematic in all age groups but opioid deaths had largest relative increase in those 55 to 64 and 65 and older (754% and 635% increase respectively; 0.2% to 1.7% and 0.01% to 0.07%) (Gomez et al 2018)
  - 18.4% of all opioid deaths were in patients over age 55

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Preventing ADEs

- Maintain an accurate list of all medications that a patient is currently using
  - Zoloft (Sertraline) 25mg by mouth every morning for depression and anxiety
- Periodic "brown bag check-ups"
- Tell patients about potential drug confusions
- Use pillboxes and blister packs where indicated
- Enlist help (family, VNA) when possible
- Be aware of transitions in care settings
- Don’t discharge older patients on as needed benzodiazepines or “routine” inpatient meds
- Review current meds, OTC meds, supplements, creams and ointments
- Discontinue unnecessary meds
- Consider non-pharmacologic approaches — sleep, anxiety
- Simplify the dosing schedule

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Inappropriate Prescribing for Older Adults

Take home points:

- Many psychiatric medications are on beers criteria list and STOPP/START
- Lists can help guide prescribing to help prescribers make safer choices for older adults
- Sometimes medications on the list are necessary and can be appropriate if prescribed consciously and carefully
- Polypharmacy alone is a risk even if medications are not on list and de-prescribing when possible should be a priority for our older patients

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Questions?

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