Table 2. 2023 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults

Organ System, Therapeutic Category, Drugs	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Antihistamines				
First-generation antihistamines • **Brompheniramine** • **Chlorpheniramine** • **Cyproheptadine** • **Dimenhydrinate** • **Diphenhydramine** (PO) • **Doxylamine** • **Hydroxyzine** • **Meclizine** • **Promethazine** • **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. Cumulative exposure to anticholinergic drugs is associated with an increased risk of falls, delirium, and dementia, even in younger adults. Consider total anticholinergic burden during regular medication reviews and be cautious in "young-old" as well as "old-old" adults. Use of diphenhydramine in situations such as acute treatment of severe allergic reactions may be appropriate.	Avoid	Moderate	Strong
Anti-infective				
Nitrofurantoin	Potential for pulmonary toxicity, hepatotoxicity, and peripheral neuropathy, especially with long-term use; safer alternatives available	Avoid in individuals with CrCl <30 mL/ min or for long-term suppression.	Low	Strong
Cardiovascular and antithrombotics				
Aspirin for primary prevention of cardiovascular disease	Risk of major bleeding from aspirin increases markedly in older age. Studies suggest a lack of net benefit and	Avoid initiating aspirin for primary prevention of	High	Strong

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	potential for net harm when initiated for primary prevention in older adults. There is less evidence about stopping aspirin among long-term users, although similar principles for initiation may apply. *Note*: Aspirin is generally indicated for secondary prevention in older adults with established cardiovascular disease.	cardiovascular disease. Consider deprescribing aspirin in older adults already taking it for primary prevention.		
Warfarin for the treatment of nonvalvular atrial fibrillation or venous thromboembolism (VTE)	Compared with DOACs, warfarin has higher risks of major bleeding (particularly intracranial bleeding) and similar or lower effectiveness for the treatment of nonvalvular atrial fibrillation and VTE. DOACs are thus the preferred choice for anticoagulation for most people with these conditions.	Avoid starting warfarin as initial therapy unless alternative options (i.e., DOACs) are contraindicated or there are substantial barriers to their use. For older adults who have been using warfarin long-term, it may be reasonable to continue this medication, particularly among those with well-controlled INRs (i.e., >70% time in the therapeutic range) and no adverse effects.	High	Strong
Rivaroxaban for long-term treatment of nonvalvular atrial fibrillation or venous thromboembolism (VTE)	At doses used for long-term treatment of VTE or nonvalvular atrial fibrillation, rivaroxaban appears to have a higher risk of major bleeding and GI bleeding in older adults than other DOACs, particularly apixaban. Rivaroxaban may be reasonable in special situations, for example when once-daily dosing is necessary to facilitate medication adherence. All DOACs confer a	Avoid for long-term treatment of atrial fibrillation or VTE in favor of safer anticoagulant alternatives.	Moderate	Strong

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	lower risk of intracranial hemorrhage than warfarin.			
Dipyridamole, oral short-acting (does not apply to 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
Non-selective peripheral alpha-1 blockers for the 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
Central alpha-agonists for the treatment of hypertension • **Clonidine** • **Guanfacine**	High risk of adverse CNS effects; may cause bradycardia and orthostatic hypotension; not recommended as routine treatment for hypertension.	Avoid clonidine as first-line treatment for hypertension. Avoid other central alpha-agonists for the treatment of hypertension.	Low	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 the patient has heart failure or substantial left ventricular hypertrophy.	High	Strong
Dronedarone	Worse outcomes in people who have permanent atrial fibrillation or severe or recently decompensated heart failure. In some circumstances, worse outcomes have also	Avoid in individuals with permanent atrial fibrillation or severe or recently decompensated heart failure.	High	Strong

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	been reported in people with HFrEF (e.g., left ventricular ejection fraction ≤35%) who have milder symptoms (NYHA class I or II).	Use caution in patients with HFrEF with less severe symptoms (NYHA class I or II)		
Digoxin for first-line treatment of atrial fibrillation or heart failure	Use in atrial fibrillation: should not be used as a first-line agent because there are safer and more effective alternatives for rate control. Use in heart failure: evidence for benefits and harms of digoxin is conflicting and of lower quality; most (but not all) evidence concerns use in HFrEF. There is strong evidence for other agents as firstline therapy to reduce hospitalizations and mortality in adults with HFrEF. In heart failure, higher dosages are not associated with additional benefits and may increase the risk of toxicity. Use caution in discontinuing digoxin among current users with HFrEF, given limited evidence suggesting worse clinical outcomes after discontinuation. Decreased renal clearance of digoxin may lead to an increased risk of toxic effects; further dose reduction may be necessary for those with Stage 4 or 5 chronic kidney disease.	Avoid this rate control agent as first-line therapy for atrial fibrillation. Avoid as first-line therapy for heart failure. See rationale for caution about withdrawal in long-term users with HFrEF. If used for atrial fibrillation or heart failure, avoid dosages >0.125 mg/day	Afib;HF: low Dose > 0.125 mg/ day: moderate	Strong
Central Nervous System				
Antidepressants with strong anticholinergic activity, alone or in combination • **Amitriptyline** • **Amoxapine**	Highly anticholinergic, sedating, and cause orthostatic hypotension; the safety profile of low-dose doxepin (≤6 mg/day) is comparable to that of placebo	Avoid	High	Strong

• **Clomipramine** • **Desipramine** • **Doxepin >6 mg/day** • **Imipramine** • **Nortriptyline** • **Paroxetine**				
Antiparkinsonian agents with strong anticholinergic activity • **Benztropine (PO)** • **Trihexyphenidyl**	Not recommended for prevention or treatment of extrapyramidal symptoms due to antipsychotics; more effective agents available for the treatment of Parkinson disease.	Avoid	Moderate	Strong
Antipsychotics, first- (typical) and second- (atypical) generation • **Aripiprazole** • **Haloperidol** • **Olanzapine** • **Quetiapine** • **Risperidone** • **Others**	Increased risk of stroke and greater rate of cognitive decline and mortality in persons with dementia. Additional evidence suggests an association of increased risk between antipsychotic medication and mortality independent of dementia. Avoid antipsychotics for behavioral problems of dementia or delirium unless documented nonpharmacologic options (e.g., behavioral interventions) have failed and/or the patient is threatening substantial harm to self or others. If used, periodic deprescribing attempts should be considered to assess ongoing need and/or the lowest effective dose.	Avoid, except in FDA-approved indications such as schizophrenia, bipolar disorder, Parkinson disease psychosis, adjunctive treatment of major depressive disorder, or for short-term use as an antiemetic.	Moderate	Strong
Barbiturates • **Butalbital** • **Phenobarbital** • **Primidone**	High rate of physical dependence, tolerance to sleep benefits, greater risk of overdose at low dosages.	Avoid	High	Strong
Benzodiazepines • **Alprazolam**	The use of benzodiazepines exposes users to risks of abuse, misuse, and addiction. Concomitant use of	Avoid	Moderate	Strong

• **Chlordiazepoxide** (alone or in combination with amitriptyline or clidinium) • **Clobazam** • **Clonazepam** • **Clorazepate** • **Diazepam** • **Estazolam** • **Lorazepam** • **Midazolam** • **Oxazepam** • **Temazepam** • **Triazolam**	opioids may result in profound sedation, respiratory depression, coma, and death. Older adults have increased sensitivity to benzodiazepines and decreased metabolism of long-acting agents; the continued use of benzodiazepines may lead to clinically significant physical dependence. In general, all benzodiazepines increase the 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.			
Nonbenzodiazepine benzodiazepine receptor agonist hypnotics ("Z-drugs") • **Eszopiclone** • **Zaleplon** • **Zolpidem**	Nonbenzodiazepine benzodiazepine receptor agonist hypnotics ("Z-drugs") have adverse events similar to those of benzodiazepines in older adults (e.g., delirium, falls, fractures, increased emergency room visits/ hospitalizations, motor vehicle crashes); minimal improvement in sleep latency and duration.	Avoid	Moderate	Strong
Meprobamate	High rate of physical dependence; very sedating.	Avoid	Moderate	Strong
Ergoloid mesylates (dehydrogenated ergot alkaloids)	Lack of efficacy.	Avoid	High	Strong
Endocrine				
Androgens • **Methyltestosterone** • **Testosterone**	Potential for cardiac problems; potential risks in men with prostate cancer.	Avoid unless indicated for confirmed hypogonadism with clinical symptoms.	Moderate	Weak

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Estrogens with or without progestins (includes natural and synthetic estrogen preparations)	Evidence of carcinogenic potential (breast and endometrium); lack of cardioprotective effect and cognitive protection in older women. For women who start HRT at age 60 and older, the risks of HRT are greater than the benefits, as HRT is linked to a higher risk of heart disease, stroke, blood clots, and dementia. 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 (e.g., dosages of estradiol <25 mcg twice weekly) with their healthcare provider	Do not initiate systemic estrogen (e.g., oral tablets or transdermal patches). Consider deprescribing among older women already using this medication. Vaginal cream or vaginal tablets: acceptable to use low-dose intravaginal estrogen for the management of dyspareunia, recurrent lower urinary tract infections, and other vaginal symptoms.	Oral and patch: high Vaginal cream or vaginal tablets: moderate	Oral and patch: strong Topical vaginal cream or tablets: weak
Insulin, sliding scale	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
Sulfonylureas (all, including short- and longer-acting) • **Gliclazide** • **Glimepiride** • **Glipizide**	Sulfonylureas have a higher risk of cardiovascular events, all-cause mortality, and hypoglycemia than alternative agents. Sulfonylureas may increase the risk of cardiovascular death and ischemic stroke.	Avoid sulfonylureas as first- or second-line monotherapy or add-on therapy unless there are substantial barriers to the use of safer and more effective agents.	Hypoglycemia: High CV events and all cause mortality:	Strong

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• **Glyburide** (Glibenclamide)	Among sulfonylureas, long-acting agents (e.g., glyburide, glimepiride) confer a higher risk of prolonged hypoglycemia than short-acting agents (e.g., glipizide).	If a sulfonylurea is used, choose short acting agents (e.g., glipizide) over long acting agents.	Moderate CV death and ischemic stroke: Low	
Desiccated thyroid	Concerns about cardiac effects; safer alternatives available.	Avoid	Low	Strong
Megestrol	Minimal effect on weight; increases the risk of thrombotic events and possibly death in older adults.	Avoid	Moderate	Strong
Growth hormone	Impact on body composition is small and associated with edema, arthralgia, carpal tunnel syndrome, gynecomastia, and impaired fasting glucose.	Avoid, except for patients rigorously diagnosed by evidence-based criteria with growth hormone deficiency due to an established etiology.	High	Strong
Gastrointestinal				
Proton-pump inhibitors • **Dexlansoprazole** • **Esomeprazole** • **Lansoprazole** • **Omeprazole** • **Pantoprazole** • **Rabeprazole**	Risk of *C. difficile* infection, pneumonia, GI malignancies, bone loss, and fractures.	Avoid scheduled use for >8 weeks unless for high-risk patients, esophagitis, pathologic hypersecretory condition, or demonstrated need for maintenance treatment.	*C. difficile*, bone loss, and fractures: High Pneumonia and GI malignancies: Moderate	Strong
Metoclopramide	Can cause extrapyramidal effects, including tardive dyskinesia; the risk may be greater in frail older adults and with prolonged exposure.	Avoid, unless for gastroparesis with a duration of use not to exceed 12 weeks except in rare cases.	Moderate	Strong

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GI antispasmodics with strong anticholinergic activity • **Atropine** (excludes ophthalmic) • **Clidinium-chlordiazepoxide** • **Dicyclomine** • **Hyoscyamine** • **Scopolamine**	Highly anticholinergic, uncertain effectiveness.	Avoid	Moderate	Strong
Mineral oil (PO)	Potential for aspiration and adverse effects; safer alternatives available.	Avoid	Moderate	Strong
Genitourinary				
Desmopressin	High risk of hyponatremia; safer alternative treatments for nocturia (including nonpharmacologic).	Avoid for treatment of nocturia or nocturnal polyuria	Moderate	Strong
Pain Medications				
Non-COX-2-selective NSAIDs, oral: • **Aspirin** >325 mg/day • **Diclofenac** • **Diflunisal** • **Etodolac** • **Flurbiprofen** • **Ibuprofen** • **Indomethacin** • **Ketorolac** • **Meloxicam** • **Nabumetone** • **Naproxen**	Increased risk of GI bleeding or peptic ulcer disease in high-risk groups, including those >75 years old or taking oral or parenteral corticosteroids, anticoagulants, or antiplatelet agents; use of proton-pump inhibitor or misoprostol reduces but does not eliminate risk. Upper GI 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 the patient can take a gastroprotective agent. Avoid short-term scheduled use in combination with oral or parenteral corticosteroids, anticoagulants, or antiplatelet agents unless other alternatives are not effective and the patient can	Moderate	Strong

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• **Oxaprozin** • **Piroxicam** • **Sulindac**		take a gastroprotective agent.		
Indomethacin **Ketorolac** (oral and parenteral)	Increased risk of GI bleeding/peptic ulcer disease and acute kidney injury in older adults. Of all the NSAIDs, indomethacin has the most adverse effects, including a higher risk of adverse CNS effects.	Avoid	Moderate	Strong
Meperidine	Oral analgesic not effective in dosages commonly used; may have a higher risk of neurotoxicity, including delirium, than other opioids; safer alternatives available.	Avoid	Moderate	Strong
Skeletal muscle relaxants • **Carisoprodol** • **Chlorzoxazone** • **Cyclobenzaprine** • **Metaxalone** • **Methocarbamol** • **Orphenadrine**	Muscle relaxants typically used to treat musculoskeletal complaints are poorly tolerated by older adults due to anticholinergic adverse effects, sedation, and increased risk of fractures; effectiveness at dosages tolerated by older adults is questionable. This criterion does not apply to skeletal muscle relaxants typically used for the management of spasticity (i.e., baclofen and tizanidine) although these drugs can also cause substantial adverse effects	Avoid	Moderate	Strong

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Table 3. 2023 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults Due to Drug-Disease or Drug-Syndrome Interactions That May Exacerbate the Disease or Syndrome

Disease or Syndrome	Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Cardiovascular					
Heart Failure	• Cilostazol • Dextromethorphan-quinidine • Non-DHP CCBs • Diltiazem • Verapamil • Dronedarone • NSAIDs and COX-2 inhibitors • Thiazolidinediones • Pioglitazone	Potential to promote fluid retention and/or exacerbate heart failure (NSAIDs and COX-2 inhibitors, non-dihydropyridine CCBs, thiazolidinediones); potential to increase mortality in older adults with heart failure (cilostazol and dronedarone); concerns about QT prolongation (dextromethorphan-quinidine). *Note*: This is not a comprehensive list of medications to avoid in patients with heart failure	Avoid: • Cilostazol • Dextromethorphan-quinidine Avoid in heart failure with reduced ejection fraction: • Non-DHP CCBs • Diltiazem • Verapamil Use with caution in patients with heart failure who are asymptomatic; avoid in patients with symptomatic heart failure: • Dronedarone • NSAIDs and COX-2 inhibitors • Thiazolidinediones • Pioglitazone	Cilostazol, dextromethorphan-quinidine, COX-2 inhibitors: Low Non-DHP CCBs, NSAIDs: Moderate Dronedarone, thiazolidinediones: High	Strong
Syncope	Antipsychotics (selected): • Chlorpromazine • Olanzapine	Antipsychotics listed and tertiary TCAs increase the risk of orthostatic hypotension.	Avoid	High	Antipsychotics, nonselective peripheral

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	Cholinesterase inhibitors (AChEIs): • Donepezil • Galantamine • Rivastigmine Non-selective peripheral alpha-1 blockers • Doxazosin • Prazosin • Terazosin Tertiary tricyclic antidepressants (TCAs): • Amitriptyline • Clomipramine • Doxepin • Imipramine	AChEIs cause bradycardia and should be avoided in older adults whose syncope may be due to bradycardia. Non-selective peripheral alpha-1 blockers cause orthostatic blood pressure changes and should be avoided in older adults whose syncope may be due to orthostatic hypotension			alpha-1 blockers: Weak AChEIs, tertiary TCAs: Strong
Central Nervous System					
Delirium	Anticholinergics Antipsychotics Benzodiazepines Corticosteroids (oral and parenteral) H2-receptor antagonists • Cimetidine • Famotidine • Nizatidine Nonbenzodiazepine benzodiazepine receptor agonist hypnotics (“Zdrugs”) • Eszopiclone • Zaleplon	Avoid in older adults with or at high risk of delirium because of the potential of inducing or worsening delirium. Antipsychotics: avoid for behavioral problems of dementia or delirium unless nonpharmacologic options (eg, behavioral interventions) have failed or are not possible and the older adult is threatening substantial harm to self or others. If used, periodic deprescribing attempts should be considered to assess ongoing need and/or the lowest effective dose.	Avoid, except in situations listed under the rationale statement.	H2-receptor antagonists: Low All others: Moderate	Strong

	• Zolpidem Opioids	Corticosteroids: if needed, use the lowest possible dose for the shortest duration and monitor for delirium. Opioids: emerging data highlights an association between opioid administration and delirium. For older adults with pain, use a balanced approach, including the use of validated pain assessment tools and multimodal strategies that include non drug approaches to minimize opioid use.			
Dementia or cognitive impairment	Anticholinergics Antipsychotics, chronic use or persistent as-needed use Benzodiazepines Nonbenzodiazepine benzodiazepine receptor agonist hypnotics ("Zdrugs") • Eszopiclone • Zaleplon • Zolpidem	Avoid because of adverse CNS effects. See criteria on individual drugs for additional information. Antipsychotics: increased risk of stroke and greater rate of cognitive decline and mortality in people with dementia. Avoid antipsychotics for behavioral problems of dementia or delirium unless documented nonpharmacologic options (e.g., behavioral interventions) have failed and/or the patient is threatening substantial harm to self or others. If used, periodic deprescribing attempts should be considered to assess ongoing need and/or the lowest effective dose.	Avoid	Moderate	Strong
History of falls or fractures	Anticholinergics Antidepressants (selected classes): • SNRIs	May cause ataxia, impaired psychomotor function, syncope, or additional falls. Antidepressants (selected classes): evidence	Avoid unless safer alternatives are not available. Antiepileptics: avoid	Antidepressants, opioids: Moderate All others:	Strong

	• SSRIs • TCAs Antiepileptics Antipsychotics Benzodiazepines Nonbenzodiazepine benzodiazepine receptor agonist hypnotics ("Zdrugs") • Eszopiclone • Zaleplon • Zolpidem Opioids	for risk of falls and fractures is mixed; newer evidence suggests that SNRIs may increase falls risk. Benzodiazepines: shorter-acting ones are not safer than long-acting ones. If one of the drugs must be used, consider reducing the use of other CNS-active medications that increase the risk of falls and fractures and implement other strategies to reduce fall risk.	except for seizures and mood disorders. Opioids: avoid except for pain management in the setting of severe acute pain.	High	
Parkinson disease	Antiemetics • Metoclopramide • Prochlorperazine • Promethazine Antipsychotics (except clozapine, pimavanserin, and quetiapine)	Dopamine-receptor antagonists with the potential to worsen parkinsonian symptoms Exceptions: clozapine, pimavanserin, and quetiapine appear to be less likely to precipitate the worsening of Parkinson disease than other antipsychotics.	Avoid	Moderate	Strong
Gastrointestinal					
History of gastric or duodenal ulcers	Aspirin Non-COX-2 selective NSAIDs	May exacerbate existing ulcers or cause new/additional ulcers	Avoid unless other alternatives are not effective and the patient can take a gastroprotective agent.	Moderate	Strong
Kidney/urinary tract					
Urinary incontinence (all types) in women	Non-selective peripheral alpha-1 blockers • Doxazosin	Aggravation of incontinence (alpha-1 blockers), lack of efficacy (oral estrogen)	Avoid in women	Non-selective peripheral alpha-1 blockers:	Non-selective peripheral alpha-1 blockers:

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	• Prazosin • Terazosin Estrogen, oral and transdermal (excludes intravaginal estrogen)			Moderate Estrogen: High	Strong Estrogen: Strong
Lower urinary tract symptoms, benign prostatic hyperplasia	Strongly anticholinergic drugs, except antimuscarinics for urinary incontinence	May decrease urinary flow and cause urinary retention	Avoid in men	Moderate	Strong

Table 4. 2023 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medications: Drugs to Be Used With Caution in Older Adults

Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Dabigatran for long-term treatment of nonvalvular atrial fibrillation or venous thromboembolism (VTE)	Increased risk of GI bleeding compared with warfarin (based on head-to-head clinical trials) and of GI bleeding and major bleeding compared with apixaban (based on observational studies and meta-analyses) in older adults when used for long-term treatment of nonvalvular atrial fibrillation or VTE.	Use caution in selecting dabigatran over other DOACs (e.g., apixaban) for long-term treatment of nonvalvular atrial fibrillation or VTE.	Moderate	Strong
Prasugrel **Ticagrelor**	Both increase the risk of major bleeding in older adults compared with clopidogrel, especially among those 75 years old and older. However, this risk may be offset by cardiovascular benefits in select patients.	Use with caution, particularly in adults 75 years old and older. If prasugrel is used, consider a lower dose (5 mg) for those 75 years old and older	Moderate	Strong
Antidepressants (selected): • **Mirtazapine**	May exacerbate or cause SIADH or hyponatremia; monitor sodium levels closely when starting or	Use with caution	Moderate	Strong

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• **SNRIs** • **SSRIs** • **TCAs** Antiepileptics (selected): • **Carbamazepine** • **Oxcarbazepine** **Antipsychotics** **Diuretics** **Tramadol**	changing dosages in older adults.			
Dextromethorphan-quinidine	Limited efficacy in patients with behavioral symptoms of dementia (does not apply to the treatment of pseudobulbar affect). May increase the risk of falls and concerns with clinically significant drug interactions and with use in those with heart failure.	Use with caution	Moderate	Strong
Trimethoprim-sulfamethoxazole	Increased risk of hyperkalemia when used concurrently with an ACEI, ARB, or ARNI in presence of decreased CrCl.	Use with caution in patients on ACEI, ARB, or ARNI and decreased CrCl.	Low	Strong
Sodium-glucose cotransporter-2 (SGLT2) inhibitors • **Canagliflozin** • **Dapagliflozin** • **Empagliflozin** • **Ertugliflozin**	Older adults may be at increased risk of urogenital infections, particularly women in the first month of treatment. An increased risk of euglycemic diabetic ketoacidosis has also been seen in older adults.	Use with caution. Monitor patients for urogenital infections and ketoacidosis.	Moderate	Weak

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Table 5. 2023 American Geriatrics Society Beers Criteria for Potentially Clinically Important Drug-Drug Interactions That Should Be Avoided in Older Adults.

Object Drug or Class	Interacting Drug or Class	Risk Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
RAS inhibitors (**ACEIs, ARBs, ARNIs, aliskiren**) or potassium-sparing diuretics (**amiloride, triamterene**)	Another RAS inhibitor or a potassium sparing diuretic	Increased risk of hyperkalemia.	Avoid routinely using 2 or more RAS inhibitors, or a RAS inhibitor and potassium-sparing diuretic, concurrently in those with chronic kidney disease Stage 3a or higher.	Moderate	Strong
Opioids	Benzodiazepines	Increased risk of overdose and adverse events.	Avoid	Moderate	Strong
Opioids	Gabapentin Pregabalin	Increased risk of severe sedation-related adverse events, including respiratory depression and death.	Avoid; exceptions are when transitioning from opioid therapy to gabapentin or pregabalin, or when using gabapentinoids to reduce opioid dose, although caution should be used in all circumstances.	Moderate	Strong
Anticholinergics	Anticholinergics	Use of more than one medication with anticholinergic properties increases the risk of cognitive decline, delirium, and falls or fractures.	Avoid; minimize the number of anticholinergic drugs.	Moderate	Strong
Antiepileptics Antidepressants (TCAs, SSRIs, and SNRIs) Antipsychotics Benzodiazepines Nonbenzodiazepine	Any combination of ≥ 3 of these CNS-active drugs	Increased risk of falls and of fracture with the concurrent use of ≥ 3 CNS-active agents (antiepileptics including gabapentinoids, antidepressants, antipsychotics, benzodiazepines,	Avoid concurrent use of ≥ 3 CNS-active drugs (among types as listed at left); minimize the number of CNS-active drugs.	High	Strong

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benzodiazepine receptor agonist hypnotics Opioids Skeletal muscle relaxants		nonbenzodiazepine benzodiazepine receptor agonist hypnotics, opioids, and skeletal muscle relaxants).			
Lithium	ACEIs ARBs ARNIs	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
Non-selective peripheral alpha-1 blockers	Loop diuretics	Increased risk of urinary incontinence in older women.	Avoid in older women, unless conditions warrant both drugs.	Moderate	Strong
Phenytoin	Trimethoprim-sulfamethoxazole	Increased risk of phenytoin toxicity.	Avoid	Moderate	Strong
Theophylline	Cimetidine	Increased risk of theophylline toxicity	Avoid	Moderate	Strong
Theophylline	Ciprofloxacin	Increased risk of theophylline toxicity	Avoid	Moderate	Strong
Warfarin	Amiodarone Ciprofloxacin Macrolides (excluding azithromycin) Trimethoprim-sulfamethoxazole SSRIs	Increased risk of bleeding.	Avoid when possible; if used together, monitor INR closely.	Moderate	Strong

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Table 6. 2023 American Geriatrics Society Beers Criteria for Medications That Should Be Avoided or Have Their Dosage Reduced With Varying Levels of Kidney Function in Older Adults

Drug	CrCl (mL/min) at which action is required	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Anti-infective					
Ciprofloxacin	< 30	Increased risk of CNS effects (e.g., seizures, confusion) and tendon rupture.	Dosages used to treat common infections typically require reduction when CrCl <30 mL/min.	Moderate	Strong
Nitrofurantoin	< 30	Potential for pulmonary toxicity, hepatotoxicity, and peripheral neuropathy, especially with long-term use.	Avoid if CrCl <30 mL/min	Low	Strong
Trimethoprim-sulfamethoxazole	< 30	Increased risk of worsening of kidney function and hyperkalemia; risk of hyperkalemia especially prominent with concurrent use of an ACE, ARB, or ARNI.	Reduce dosage if CrCl is 15–29 mL/min. Avoid if CrCl <15 mL/min.	Moderate	Strong
Cardiovascular and antithrombotic					
Amiloride	< 30	Hyperkalemia and hyponatremia	Avoid	Moderate	Strong
Dabigatran	< 30	Lack of evidence for efficacy and safety in individuals with a CrCl <30 mL/min. Label dose for patients with CrCl 15–30 mL/min based on pharmacokinetic data.	Avoid when CrCl <30 mL/min; dose adjustment is advised when CrCl >30 mL/min in the presence of	Moderate	Strong

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			drug–drug interactions.		
Dofetilide	< 60	QTc prolongation and torsades de pointes.	Reduce dose if CrCl is 20–59 mL/min. Avoid if CrCl <20 mL/min.	Moderate	Strong
Edoxaban	15 - 50 < 15 or > 95	Lack of evidence of efficacy or safety in patients with CrCl <30 mL/min.	Reduce dose if CrCl is 15– 50 mL/min. Avoid if CrCl <15 or > 95 mL/min.	Moderate	Strong
Enoxaparin	< 30	Increased risk of bleeding	Reduce dose	Moderate	Strong
Fondaparinux	< 30	Increased risk of bleeding	Avoid	Moderate	Strong
Rivaroxaban	< 50	Lack of efficacy or safety evidence in people with CrCl <15 mL/min; limited evidence for CrCl 15–30 mL/min.	Avoid if CrCl <15 mL/min. Reduce the dose if CrCl is 15–50 mL/min following manufacturer dosing recommendations based on indication-specific dosing.	Moderate	Strong
Spironolactone	< 30	Hyperkalemia	Avoid	Moderate	Strong
Triamterene	< 30	Hyperkalemia and hyponatremia	Avoid	Moderate	Strong
Central nervous system and analgesics					

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Baclofen	eGFR < 60	Increased risk of encephalopathy requiring hospitalization in older adults with eGFR <60 mL/min or who require chronic dialysis.	Avoid baclofen in older adults with impaired kidney function (eGFR <60 mL/min). When baclofen cannot be avoided, use the lowest effective dose and monitor for signs of CNS toxicity, including altered mental status.	Moderate	Strong
Duloxetine	< 30	Increased GI adverse effects (nausea, diarrhea)	Avoid	Moderate	Weak
Gabapentin	< 60	CNS adverse effects	Reduce dose	Moderate	Strong
Levetiracetam	≤80	CNS adverse effects	Reduce dose	Moderate	Strong
NSAIDs (nonselective, COX-2 selective, and nonacetylated salicylates, oral and parenteral)	< 30	May increase the risk of acute kidney injury and a further decline in kidney function	Avoid	Moderate	Strong
Pregabalin	< 60	CNS adverse effects	Reduce dose	Moderate	Strong
Tramadol	< 30	CNS adverse effects	Immediate release: reduce dose Extended-release: avoid	Low	Weak
Gastrointestinal					
Cimetidine	< 50	Mental status changes	Reduce dose	Moderate	Strong
Famotidine	< 50	Mental status changes	Reduce dose	Moderate	Strong

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Nizatidine	< 50	Mental status changes	Reduce dose	Moderate	Strong
Hyperuricemia					
Colchicine	< 30	GI, neuromuscular, and bone marrow toxicity	Reduce dose; monitor for adverse effects	Moderate	Strong
Probenecid	< 30	Loss of effectiveness	Avoid	Moderate	Strong

Table 7. Drugs With Strong Anticholinergic Properties		
Antidepressants • Amitriptyline • Amoxapine • Clomipramine • Desipramine • Doxepin (>6 mg/day) • Imipramine • Nortriptyline • Paroxetine	**Antimuscarinics (urinary incontinence)** • Darifenacin • Fesoterodine • Flavoxate • Oxybutynin • Solifenacin • Tolterodine • Trospium	**Antispasmodics** • Atropine • Clidinium-chlordiazepoxide • Dicyclomine • Homatropine • Hyoscyamine • Scopolamine
Antiemetics • Prochlorperazine • Promethazine	**Antiparkinsonian agents** • Benztropine • Trihexyphenidyl	**Skeletal muscle relaxants** • Cyclobenzaprine • Orphenadrine
Antihistamines (first-generation) • Brompheniramine • Chlorpheniramine • Cyproheptadine • Dimenhydrinate • Diphenhydramine	**Antipsychotics** • Chlorpromazine • Clozapine • Olanzapine • Perphenazine	

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• Doxylamine • Hydroxyzine • Meclizine • Promethazine • Triprolidine		

Table 8. Medications/Criteria Removed since 2019 American Geriatrics Society Beers Criteria

Medication/Criteria	Reason for removal
Independent of Diagnosis or Condition	
• Carbinoxamine	• Low use
• Clemastine	• Low use
• Dextrobromphiniramine	• Not on the US market
• Dexchlorpheniramine	• Low use
• Pyrilamine	• Not on the US market
• Belladonna alkaloids	• Not on the US market
• Methscopolamine	• Low use
• Propantheline	• Not on the US market
• Guanabenz	• Not on the US market
• Methyldopa	• Not on the US market
• Reserpine (>0.1 mg/day)	• Not on the US market
• Disopyramide	• Low use
• Protriptyline	• Low use
• Trimipramine	• Low use
• Amobarbital	• Low use, available only as an injection
• Butobarbital	• Low use
• Mephobarbital	• Not on the US market
• Pentobarbital	• Not on the US market
• Secobarbital	• Not on the US market
• Flurazepam	• Low use

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• Quazepam • Isoxsuprine • Chlorpropamide • Fenoprofen • Ketoprofen • Meclofenamate • Mefenamic acid • Tolmetin	• Low use • Not on the US market • Not on the US market • Low use • Low use • Low use • Low use • Not on the US market
Considering Disease and Syndrome Interactions	
Heart failure • Rosiglitazone	Not on the US market
Syncope • Thioridazine	Low use
Delirium • Meperidine	Specific mention of meperidine was removed from this criterion because it is subsumed under the general category of opioids, which was added to this criterion.
Ranitidine	Removed from the US market.
Clinically Important Drug-Drug Interactions	
Corticosteroids, oral or parenteral + NSAIDs	Incorporated into oral NSAIDs criterion in Table 2
Warfarin + NSAIDs	Incorporated into oral NSAID criterion in Table 2 (i.e, recommendation to avoid short-term regular, scheduled use of NSAIDs in older adults taking an anticoagulant)
Medications That Should Be Avoided or Have Their Dosage Reduced With Reduced Kidney Function	
Apixaban in patients with CrCl <25 mL/min	Emerging evidence and clinical experience supporting safe use at lower levels of renal function.

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Ranitidine	Removed from US market
Drugs With Strong Anticholinergic Properties	
• Loxapine • Trifluoperazone	Low use

Table 9. Medications/Criteria Added Since 2019 American Geriatrics Society Beers Criteria

Medication/Criterion	Reason for addition
Independent of Diagnosis or Condition	
Warfarin	Emerging data and changes in national recommendations/expert guidance
Considering Disease and Syndrome Interactions	
Heart failure • Dextromethorphan-quinidine	Supported by package insert
Delirium • Opioids	Emerging data
History of falls or fractures • Anticholinergics	Emerging data and consistency across recommendations
Use with Caution	
Ticagrelor	Emerging data
SGLT2 inhibitors	Emerging data and clinical concerns
Clinically Important Drug-Drug Interactions	

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Skeletal muscle relaxants added to any combination of ≥3 of these CNS-active drugs	Concern for adverse effects when used in combination with other CNS-active drugs
Lithium + ARBs and ARNIs	Supported by data and reference sources
Warfarin + SSRIs	Supported by data
Medications That Should be Avoided or Have Their Dosage Reduced with Reduced Kidney Function	
Baclofen	Data supporting concern

Table 10. Medications/Criteria Modified Since 2019 American Geriatrics Society Beers Criteria

Medication/Criterion	Modification
Independent of Diagnosis or Condition	
Aspirin	Moved from Table 4 to Table 2 on basis of new evidence.
Rivaroxaban	Moved from Table 4 to Table 2 on basis of accumulating evidence
Dronedarone	Clarified to reflect data about potential risks in people with non-severe forms of heart failure
Digoxin	Added statement clarifying that caution should be used discontinuing digoxin among current users with HFrEF.
Antidepressants with strong anticholinergic activity	Clarified that this criterion refers to antidepressants with strong anticholinergic activity
Antipsychotics	Updated language to reflect new evidence and enhance clarity
Benzodiazepines	Clarified language

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Androgens	Clarified that androgens pose potential risks but are not firmly contraindicated in men with a history of prostate cancer.
Estrogens, systemic	Provided additional information, supported by data
Sulfonylureas	Expanded criterion from long-acting sulfonylureas to all sulfonylureas given data supporting adverse outcomes for all sulfonylureas.
Proton pump inhibitors	Noted additional adverse outcomes in the rationale statement given supporting data.
NSAIDs, oral	Clarified application in high-risk scenarios for short-term use (i.e., including drug– drug interactions such as with warfarin)
Skeletal muscle relaxants	Clarified language to differentiate skeletal muscle relaxants typically used for musculoskeletal complaints from those used to treat spasticity.
Considering Disease and Syndrome Interactions	
Syncope - TCAs • Amitriptyline • Clomipramine • Doxepin • Imipramine	Clarified that the tertiary TCAs referenced by this criterion include those listed here.
Dementia • Antipsychotics	Modified language to reflect data and enhance clarity
Delirium	Updated rationale to comment on opioids and enhance clarity
History of falls or fractures • Antidepressants	Level of evidence lowered from "high" to "moderate" based on evidence; updated rationale to reflect new evidence and enhance clarity.
Parkinson disease	Rationale shortened for clarity.
Urinary incontinence in women	Modified language to enhance clarity

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Use with Caution	
Prasugrel	Adding dosing consideration, supported by American College of Cardiology/ American Heart Association guidelines.
Dextromethorphan-quinidine	Added heart failure concerns, supported by package insert.
Trimethoprim-sulfamethoxazole	Added ARNIs for completeness (given that they contain ARBs).
Clinically Important Drug-Drug Interactions	
Opioid + benzodiazepine	Modified to include risk for adverse effects; supported by data.
Anticholinergic + anticholinergic	Modified to recognize specific adverse events.
Use of ≥3 CNS active agents	Clarified classes of medications of concern; level of evidence raised to “high.”
Warfarin	Consolidated interacting drugs into a list versus reporting as separate lines for each interaction.
Medications That Should be Avoided or Have Their Dosage Reduced with Reduced Kidney Function	
Nitrofurantoin	Existing recommendations from Table 2 are duplicated in Table 6 to enhance clarity and usability.
Trimethoprim-sulfamethoxazole	Added clarifying language to support clinical usability.
Rivaroxaban	Clarified CrCl cutoffs per available evidence and package insert.
NSAIDs	Moved this criterion from Table 3 for greater consistency; clarified language.

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Last Updated 11/02/2023 J Am Geriatr Soc.2023;71:2052–2081. DOI: 10.1111/jgs.18372

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