

## Beers List of Potentially Inappropriate Medication Use in Older Adults

A consensus panel of experts recently updated the **Beers criteria**, one of the most widely used guidelines for medication use in older adults. (1) Listed in the Table are medications that should generally be avoided in persons aged 65 and older-- regardless of diagnosis or condition--either because the agents are ineffective in these patients or because they pose unnecessarily high risks.

Table--Potentially inappropriate medications in older adults

Drug	Concern	Severity rating (high or low)
Propoxyphene and combination products	Offers few analgesic advantages over acetaminophen, yet has the adverse effects of other narcotic drugs.	Low
Indomethacin	Of all available NSAIDs, this drug produces the most CNS adverse effects.	High
Pentazocine	Narcotic analgesic that causes more CNS adverse effects, including confusion and hallucinations, more commonly than other narcotic drugs. In addition, it is a mixed agonist and antagonist.	High
Trimethobenzamide	One of the least effective antiemetic drugs; can cause extrapyramidal adverse effects.	High
Muscle relaxants and antispasmodics: methocarbamol, carisoprodol, chlorzoxazone, metaxalone, cyclobenzaprine, and oxybutynin. Do not consider the extended-release oxybutynin.	Most muscle relaxants and antispasmodic drugs are poorly tolerated by elderly patients, since these cause anticholinergic adverse effects, sedation, and weakness. In addition, their effectiveness at doses tolerated by elderly patients is questionable.	High
Flurazepam	This benzodiazepine hypnotic has an extremely long half-life in elderly patients (often days), producing prolonged sedation and increasing the incidence of falls and fracture. Medium- or short-acting benzodiazepines are preferable.	High
Amitriptyline, chlordiazepoxide-amitriptyline, and perphenazine-amitriptyline	Because of its strong anticholinergic and sedating properties, amitriptyline is rarely the antidepressant of choice for elderly patients.	High
Doxepin	Because of its strong anticholinergic and sedating properties, doxepin is rarely the antidepressant of choice for elderly	High

Meprobamate	patients. This is a highly addictive and sedating anxiolytic. Those using meprobamate for prolonged periods may become addicted and the medication may need to be withdrawn slowly.	High
Short-acting benzodiazepines at daily doses greater than: lorazepam, 3 mg; oxazepam, 60 mg; alprazolam, 2 mg; temazepam, 15 mg; and triazolam, 0.25 mg.	Because of increased sensitivity to benzodiazepines in elderly patients, smaller doses may be effective as well as safer. Total daily doses should rarely exceed the suggested maximums.	High
Long-acting benzodiazepines: chlordiazepoxide, chlordiazepoxide-amitriptyline, clidinium-chlordiazepoxide, diazepam, quazepam, halazepam, and clorazepate.	These drugs have a long half-life in elderly patients (often several days), producing prolonged sedation and increasing the risk of falls and fractures. Short- and intermediate-acting benzodiazepines are preferred if a benzodiazepine is required.	High
Disopyramide	Of all antiarrhythmic drugs, this is the most potent negative inotrope and therefore may induce heart failure in elderly patients. It is also strongly anticholinergic. Other antiarrhythmic drugs should be used.	High
Digoxin (should not exceed 0.125 mg/d except in the treatment of atrial arrhythmias)	Decreased renal clearance may lead to increased risk of toxic effects.	Low
Short-acting dipyridamole. Do not consider long-acting dipyridamole (which has better properties than the short-acting agent in older adults) except with patients with artificial heart valves.	May cause orthostatic hypotension.	Low
Methyldopa and methyldopa-hydrochlorothiazide	May cause bradycardia and exacerbate depression in elderly patients.	High
Reserpine at doses > 0.25 mg	May induce depression, impotence, sedation, and orthostatic hypotension.	Low
Chlorpropamide	Has a prolonged half-life in elderly patients and could cause prolonged hypoglycemia. In addition, it is the only oral hypoglycemic agent that causes SIADH.	High
GI antispasmodic drugs: dicyclomine, hyoscyamine, propantheline, belladonna alkaloids, and clidinium-chlordiazepoxide	GI antispasmodic drugs are highly anticholinergic and have uncertain effectiveness. These drugs should be avoided (especially for long-term use).	High

Anticholinergics and antihistamines: chlorpheniramine, diphenhydramine, hydroxyzine, tripeleennamine, cyproheptadine, promethazine, dexchlorpheniramine.	All nonprescription and many prescription antihistamines may have potent anticholinergic properties. Nonanticholinergic antihistamines are preferred in elderly patients being treated for allergic reactions.	High
Diphenhydramine	May cause confusion and sedation. Should not be used as a hypnotic, and when used to treat emergency allergic reactions, it should be used in the smallest possible dose.	High
Ergot mesyloids and cyclandelate	Have not been shown to be effective in the doses studied.	Low
Ferrous sulfate > 325 mg/d	Doses > 325 mg/d do not dramatically increase the amount absorbed but greatly increase the incidence of constipation.	Low
All barbiturates (except phenobarbital) except when used to control seizures	Are highly addictive and cause more adverse effects than most sedative or hypnotic drugs in elderly patients.	High
Meperidine	Not an effective oral analgesic in doses commonly used. May cause confusion and has many disadvantages compared with other narcotics.	High
Ticlopidine	Has been shown to be no better than aspirin in preventing clotting and may be considerably more toxic. Safer, more effective alternatives exist.	High
Ketorolac	Immediate and long-term use should be avoided in older persons, since a significant number have asymptomatic GI pathologic conditions.	High
Amphetamines and anorexic agents	These drugs have potential for causing dependence, hypertension, angina, and myocardial infarction.	High
Long-term use of full-dosage, longer half-life, non-COX-selective NSAIDs: naproxen, oxaprozin, and piroxicam	Have the potential to produce GI bleeding, renal failure, high blood pressure, and heart failure.	High
Daily fluoxetine	Long half-life of drug and risk of producing excessive CNS stimulation, sleep disturbances, and increasing agitation. Safer alternatives exist.	High
Long-term use of stimulant laxatives: bisacodyl, cascara sagrada, and castor oil, except in the presence of opiate analgesic use.	May exacerbate bowel dysfunction.	High
Amiodarone	Associated with QT interval problems and risk of provoking torsades de pointes. Lack of efficacy in older adults.	High

Orphenadrine	Causes more sedation and anti-cholinergic adverse effects than safer alternatives.	High
Guanethidine	May cause orthostatic hypotension. Safer alternatives exist.	High
Guanadrel	May cause orthostatic hypotension.	High
Cyclandelate	Lack of efficacy.	Low
Isoxsuprine	Lack of efficacy.	Low
Nitrofurantoin	Potential for renal impairment. Safer alternatives available.	High
Doxazosin	Potential for hypotension, dry mouth, and urinary problems.	Low
Methyltestosterone	Potential for prostatic hypertrophy and cardiac problems.	High
Thioridazine	Greater potential for CNS and extrapyramidal adverse effects.	High
Mesoridazine	CNS and extrapyramidal adverse effects.	High
Short-acting nifedipine	Potential for hypotension and constipation.	High
Clonidine	Potential for orthostatic hypotension and CNS adverse effects.	Low
Mineral oil	Potential for aspiration and adverse effects. Safer alternatives available.	High
Cimetidine	CNS adverse effects, including contusion.	Low
Ethacrynic acid	Potential for hypertension and fluid imbalances. Safer alternatives available.	Low
Thyroid desiccated	Concerns about cardiac effects. Safer alternatives available.	High
Amphetamines (excluding methylphenidate hydrochloride and anorexics)	CNS stimulant adverse effects.	High
Estrogens only (oral)	Evidence of the carcinogenic (breast and endometrial cancer) potential of these agents and lack of card ioprotective effect in older women.	Low

COX, cyclooxygenase; SIADH, syndrome of inappropriate antidiuretic hormone secretion. Adapted from Fick DM et al. Arch Intern Med. 2003.

(1)

REFERENCE:

(1.) Fick DM, Cooper JW, Wade WE, et al. Updating the **Beers criteria** for potentially inappropriate medication use in older adults: results of a US consensus panel of experts. Arch Intern Med. 2003;163:2716-2724.

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