

### Potentially Inappropriate Medication Use in Older Adults

Drug/Class	Severity	Concern	Alternatives
<b>Tricyclic antidepressants:</b>	High	Strong anticholinergic and sedative properties	Depression: SSRIs, SNRIs, bupropion, mirtazepine Sleep: sleep hygiene, zolpidem, eszopiclone Neuropathy: gabapentin
<b>Antihistamines:</b> diphenhydramine (Benadryl), hydroxyzine (Atarax, Vistaril), chlorpheniramine (ChlorTrimeton)	High	Potent anticholinergic properties, confusion and sedation. Non-anticholinergic antihistamines are preferred for chronic allergy therapy. Not appropriate as hypnotic therapy.	Allergies: fexofenadine, loratadine NOTE: For acute allergic reactions use diphenhydramine is smallest possible dose for shortest possible duration
<b>GI antispasmodics/antimuscarinics:</b> dicyclomine (Bentyl), hyoscyamine (Levbid, Levsin, Levsinex), propantheline (Pro-Banthine), oxybutinin (Ditropan)	High	Strong anticholinergic properties and uncertain effectiveness. Should be avoided (especially long-term use).	IBS: Dietary modification, fiber supplements Urge incontinence: bladder retraining, scheduled toileting, darifenecin, trospium
<b>Muscle relaxants:</b> carisoprodol (Soma), chlorzoxazone (Paraflex, Parafon), cyclobenzaprine (Flexeril), metaxalone (Skelaxin) methocarbamol (Robaxin)	High	Poorly tolerated in the elderly due to potent anticholinergic effects, sedation, and weakness. Effectiveness at doses tolerated by elderly is questionable.	Musculoskeletal pain: acetaminophen, tramadol, topical analgesics
<b>Benzodiazepines, long-acting:</b> chlorazepate (Tranxene), chlordiazepoxide (Librium), diazepam (Valium), flurazepam (Dalmane),	High	Long half-life in the elderly produces prolonged sedation and increased risk of falls and fractures. Short/intermediate acting benzodiazepines without active metabolites are preferred.	Anxiety: Lorazepam
<b>NSAIDs:</b> indomethacin (Indocin), meloxicam (Mobic), ibuprofen (Advil, Motrin), naproxen (Aleve, Naprosyn, Anaprox), celecoxib (Celebrex), nabumetone (Relafen), sulindac (Clinoril), etc.	High	Have potential to induce or exacerbate GI bleeding, renal failure, high blood pressure, and heart failure.  Indomethacin has highest incidence of CNS side effects of all NSAIDs.	Osteoarthritis: acetaminophen Acute gout: naproxen
<b>Propoxyphene (Darvon, Darvocet-N)</b>	High	Few analgesic advantages over acetaminophen, yet has the ADEs and risks associated with narcotics. Norpropoxyphene metabolite may induce bradycardia, heart block, hypotension, arrhythmia or decreased cardiac contractility.	Alternative: acetaminophen, other opiates
<b>Clonidine</b>	High	Potential for orthostasis and CNS adverse effects	Other antihypertensive agents
<b>Digoxin</b> (NTE 0.125mg/d except for atrial arrhythmia).	Low	Decreased renal clearance may lead to increased risk of toxicity	
<b>Ferrous sulfate</b> (>325mg/d)	Low	Doses > 325mg day do not increase amount absorbed, but greatly increase risk of constipation.	

#### References:

1. Fick DM, et al. Updating the Beers criteria for potentially inappropriate medication use in older adults. Arch Int Med 2003;163:2716-2724.
2. NCQA. HEDIS 2006. Technical Specifications (Volume 2). Washington, DC:NCQA;2005.

**Potentially Inappropriate Medication Use in the Elderly (Considering Diagnoses or Conditions)**

<b>Disease/Condition</b>	<b>Drug/Class</b>	<b>Severity</b>	<b>Concern</b>
Chronic constipation	Anticholinergics Calcium channel blockers Tricyclic antidepressants	Low	May exacerbate constipation.
Cognitive impairment	Anticholinergics GI antispasmodics Urinary tract antispasmodics Muscle relaxants Antihistamines	High	Concern due to CNS altering effects.
COPD	Long-acting benzodiazepines	High	CNS adverse may induce or exacerbate respiratory depression.
Depression	Long-term benzodiazepine use Sympatholytic agents: methyldopa	High	May produce or exacerbate depression.
Gastric or duodenal ulcer	NSAIDs and aspirin	High	May induce or exacerbate ulcer disease
Congestive heart failure	Disopyramide (Norpace) NSAIDs	High	Disopyramide: negative inotropic effect NSAIDs: potential to promote fluid retention and exacerbate heart failure
Hypertension	Amphetamines Decongestants NSAIDs	High	Amphetamines, decongestants: may elevate blood pressure secondary to sympathomimetic activity NSAIDs: may elevate blood pressure secondary to fluid retention
Insomnia	Amphetamines, methylphenidate Decongestants Monoamine oxidase inhibitors Theophylline	High	Concern due to CNS stimulant effects
Parkinson's disease	Conventional antipsychotics, clozapine Metoclopramide	High	Concern due to antidopaminergic and anticholinergic effects.
Seizure disorder	Bupropion (Wellbutrin, Zyban) Conventional antipsychotics, clozapine	High	May lower seizure threshold
SIADH/hyponatremia	SSRIs	Low	May induce or exacerbate SIADH
Stress incontinence	Alpha-blockers Anticholinergics Tricyclic antidepressants	High	Alpha-blockers: decreased urethral tone may worsen incontinence Anticholinergics, TCAs: urinary retention may worsen urine loss during stress episode
Syncope/falls	Benzodiazepines Tricyclic antidepressants	High	May produce ataxia, impaired psychomotor function, syncope and falls

References:

3. Fick DM, et al. Updating the Beers criteria for potentially inappropriate medication use in older adults. Arch Int Med 2003;163:2716-2724.
4. NCQA. HEDIS 2006. Technical Specifications (Volume 2). Washington, DC:NCQA;2005.