High Risk Medications in the Elderly (Age≥65) and Suggested Alternatives

(This is for informational purposes only and should not be construed as treatment protocols or required practice guidelines. Diagnosis, treatment recommendations, and the provision of medical care services for patients is the responsibility of physicians and other prescribers.)

Therapeutic Class	Medication(s) †	Reason for Risk†	Alternative Medication†

Anti-inflammatories	• APAP-diphenhydramine (Tylenol PM)
	• NSAIDS
	• Ketorolac (Toradol)
		• Increases risk of GI bleeding/peptic ulcer disease in high-risk groups:
		  • >75 years old
		  • taking oral or parenteral corticosteroids
		  • anticoagulants or antiplatelet agents.
		• Use of proton pump inhibitor or misoprostol reduces but does not eliminate risk.
		• Avoid chronic use unless other alternatives are not effective and patient can take gastro protective agent (proton-pump inhibitor or misoprostol)
		• Of all the NSAIDs, indomethacin has the most adverse effects
		• May cause exacerbation of hypertension, heart failure
		• May cause deterioration in renal function
			Mild pain:
			• APAP*
			
			Moderate/severe pain:
			• morphine sulfate**
			• hydrocodone/APAP**
			• oxycodone**
			• oxycodone/APAP**
			• fentanyl patch**
			
			***limit duration*

Narcotics	• APAP/pentazocine (Talacen) • Meperidine (Demerol) • Naloxone/pentazocine (Talwin NX) • Tramadol (Ultram)	• Enhanced CNS effects: confusion, hallucinations; falls, fractures; seizure risk • Pentazocine: CNS adverse effects, including confusion and hallucinations, more commonly than other narcotic drugs; is also a mixed agonist and antagonist; safer alternatives available. • Meperidine: Not an effective oral analgesic in dosages commonly used; may cause neurotoxicity; safer alternatives available. • Tramadol: Lowers seizure threshold; may be acceptable in patients with well-controlled seizures in	Mild pain: • APAP* Moderate/severe pain: • morphine sulfate** • hydrocodone/APAP** • oxycodone** • oxycodone/APAP** • fentanyl patch** ***limit duration*

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		whom alternative agents have not been effective. • Drowsiness, postural hypotension, vertigo • Severe constipation risk • Exacerbation of cognitive impairment	
Antihistamines	• Benztropine (Cogentin) • Brompheniramine (Bromfed, Bromax, Dimetapp, Iodrane, LoHist-12) • Codeine/phenylephrine/promethazine • Codeine/promethazine • Cyproheptadine (Periactin) • Dextromethorphan/promethazine • Diphenhydramine (Benadryl, Excedrin PM, Tylenol PM) • Hydroxyzine HCL (Atarax, Vistaril) • Promethazine (Phenergan) • Trihexyphenidyl (Artane, Trihexane)	• Phenothiazines: may lower seizure threshold • Clearance reduced with advanced age • Anticholinergic side effects, especially with prolonged use (>1 week): worsened cognition & behavioral problems (especially in dementia), urinary retention OR incontinence, confusion, enhanced sedation, dry mouth, constipation, and other anticholinergic effects/toxicity. • Tolerance develops to hypnotic effect • Use of diphenhydramine may be appropriate in special situations such as acute treatment of severe allergic reaction	• Fexofenadine (Allegra)* • Desloratadine (Clarinex) • Loratadine (Claritin)* *Consider a topical agent, where appropriate.*
Anti-infectives	• Nitrofurantoin (Furadantin, Macrodantin, Macrobid)	• Nitrofurantoin: nephrotoxicity Potential for pulmonary toxicity; safer alternatives	• Trimethoprim/sulfa DS • Ciprofloxacin

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Alpha 1 Blockers	• Doxazosin (Cardura) (Beers Drug/Disease in Syncope) • Prazosin (Minipress) (Beers Drug/Disease in Syncope) • Terazosin (Hytrin) (Beers Drug/Disease in Syncope)	• Avoid use as an antihypertensive. • High risk of orthostatic hypotension; alternative agents have superior risk/benefit profile. • Risk of urinary frequency and worsening of incontinence	Selective alpha 1 blockers: • Tamsulosin (Flomax) • Sildosin (Rapaflo)
Alpha Blockers, Central	• Clonidine (Catapres) • Guanfacine (Intuniv, Tenex) • Methyldopa (Aldomet)	• High risk of adverse CNS effects; may cause bradycardia and orthostatic hypotension • Not recommended as routine treatment for hypertension. Avoid Clonidine as a first line antihypertensive.	• ACE inhibitors/ARBs • Calcium Channel Blocker • Beta-Blocker
Antiarrhythmics (Class Ia, Ic, and III)	• Amiodarone (Cordarone) • Dofetilide (Tikosyn) • Dronedarone (Multaq) • Flecainide (Tambocor) • Propafenone (Rythmol) • Sotalol (Betapace, Sorine)	• Avoid antiarrhythmic drugs as first-line treatment of atrial fibrillation (AF). Data suggest that rate control yields better balance of benefits. • Amiodarone: multiple toxicities, including thyroid disease, pulmonary disorders, and QT interval prolongation. • Dronedarone: Worse outcomes have been reported in patients who have permanent AF or heart failure. • In general, rate control is preferred over rhythm control for AF	• Beta-Blockers • Diltiazem • Verapamil
Anticoagulants	• Ticlopidine (Ticlid) (Beers overall) • Dabigatran (Pradaxa) (use with caution) • Dipyridamole (Persantine) as monotherapy for cardiovascular secondary	• Ticlopidine: Safer, effective alternatives available. • Dabigatran: Increased risk of bleeding compared with warfarin in adults ≥75 years old; lack of evidence for efficacy and safety in patients with CrCl <30 mL/min • Dipyridamole: no evidence for efficacy • Prasugrel: Increased risk of bleeding in older adults; risk may be offset by benefit in highest-risk older patients (e.g., those with prior myocardial infarction or	Stroke prevention: • Ticagrelor (Brilinta)

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	prevention • Prasugrel (Effient) (use with caution)	diabetes). • Increased risk of gastrointestinal bleeding	
Cardiovascular, other	• Disopyramide (Norpace) • Digoxin (>0.125mg/day) (Lanoxin)	• Disopyramide may induce heart failure in older adults; strongly anticholinergic; other antiarrhythmic drugs preferred. • Digoxin: In heart failure, higher dosages associated with no additional benefit and may increase risk of toxicity; decreased renal clearance (estimated GFR <50ml/min.) may lead to increased risk of toxic effects.	
Calcium Channel Blockers	• Nifedipine (Procardia) (short-acting only) • Calcium channel blockers with chronic constipation • Use of diltiazem (Cardizem, Cartia Tiazac, Dilt) or verapamil (Calan, Verelan) with NYHA Class III or IV heart failure	• Potential for hypotension; constipation; risk of precipitating myocardial ischemia. • may exacerbate constipation • may worsen heart failure	• Nifedipine ER • Amlodipine (Norvasc)
Vasodilators	• Dipyridamole(Persantine)—short-acting only • Isoxsuprine (Vasodilan) • Cilostazol in heart failure	• Orthostatic hypotension; ineffective for stroke prevention; unproven and/or questionable efficacy • Dipyridamole: orthostatic hypotension; more effective alternatives available; IV form acceptable for use in cardiac stress testing. • Isoxsuprine: lack of efficacy • Cilostazol: Potential to promote fluid retention and/or exacerbate heart failure.	<u>Stroke prevention:</u> • Aspirin • Clopidogrel (Plavix) • Aspirin and extended-release dipyridamole (Aggrenox) • Ticagrelor (Brilinta) • Prasugrel (Effient)

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Amphetamines	• Amphetamine/dextroamphetamine (Adderall) • Benzphetamine (Didrex) • Dexmethylphenidate (Focalin) • Dextroamphetamine (Dexedrine, ProCentra) • Diethylpropion (Tenuate) • Methylphenidate (Ritalin, Concerta, Daytrana, Methylin) • Pemoline in insomnia • Phendimetrazine (Bontril) • Phentermine(Adipex-P, Suprenza) • Oral decongestants with insomnia	• CNS stimulation: agitation, insomnia, hypertension, myocardial ischemia, dependence, appetite suppression	N/A
Anticonvulsants	• Anticonvulsants in history of falls or fractures • Carbamazepine (Tegretol) (use with caution)	• Ability to produce ataxia, impaired psychomotor function, syncope, and additional falls. Avoid unless safer alternatives are not available; avoid anticonvulsants except for seizures • Carbamazepine: May exacerbate or cause SIADH or hyponatremia; need to monitor sodium level closely when starting or changing dosages in older adults due to increased risk.	• Levetiracetam (Keppra)
Antidepressants	• Selective serotonin re-uptake inhibitors (SSRI's) with a history of clinically significant hyponatremia (non-iatrogenic	• Bupropion: Lowers seizure threshold; may be acceptable in patients with well-controlled seizures in whom alternative agents have not been effective. • SSRIs, SNRIs, TCAs, Mirtazapine: May exacerbate or cause SIADH or hyponatremia; need to monitor	

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	hyponatremia <130mmol/l within the previous 2 months). • Bupropion in chronic seizures or epilepsy • Mirtazapine (Remeron) (use with caution)	sodium level closely when starting or changing dosages in older adults due to increased risk. Use with caution.	
Antipsychotic, typical	• Phenothiazines in patients with epilepsy • Antipsychotics, chronic and as-needed use, in dementia and cognitive impairment/ history of falls or fractures • All antipsychotics with Parkinson disease except clozapine and quetiapine • Chlorpromazine (Thorazine) • Fluphenazine (Permitil, Prolixin) • Haloperidol (Haldol) • Perphenazine (Trilafon) • Pimozide (Orap) • Thioridazine (Mellaril)	• Phenothiazines: may lower seizure threshold • CNS side effects: seizure risk, EPS effects, tremor, slurred speech, muscular rigidity, dystonia, bradykinesia, akathisia • Increased risk of stroke and mortality in persons with dementia. • Avoid use for behavioral problems of dementia unless non-pharmacologic options have failed and patient is threat to self or others. • Thioridazine: Highly anticholinergic and greater risk of QT-interval prolongation. • Chlorpromazine/thioridazine: Lowers seizure threshold; may be acceptable in patients with well-controlled seizures in whom alternative agents have not been effective. • Parkinson's: Quetiapine and clozapine appear to be less likely to precipitate worsening of Parkinson disease. • risk of confusion, hypotension, extra-pyramidal side effects, falls • likely to worsen extra-pyramidal symptom • may cause gait dyspraxia, Parkinsonism	• Risperidone*** • Aripiprazole (Abilify)*** • Iloperidone (Fanapt)*** • Ziprasidone (Geodon)*** • Paliperidone (Invega)*** • Quetiapine (Seroquel)*** • Olanzapine (Zyprexa)*** ****atypical antipsychotics associated w/ increased mortality when used to treat behavioral issues in elderly w/ dementia.*

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Barbiturates	• Butalbital (Butisol Sodium) • Phenobarbital (Luminal, Solfoton)	• Higher risk of side effects in elderly: falls, fractures, confusion, cognitive impairment; dependence	For sleep (avoid for >90days): • Zolpidem (Ambien) • Zaleplon (Sonata) • Eszopiclone (Lunesta) • Ramelteon (Rozerem) • Behavior modification
Benzodiazepines (includes all combination drugs)	• Chlordiazepoxide (Librium) • Chlordiazepoxide/amitriptyline (Limbitrol) • Chlordiazepoxide/clidiniu m (Librax) • Clonazepam (Klonopin) • Diazepam (Valium, Diastat) • Estazolam (Promsom) • Flurazepam (Dalmane) • Lorazepam (Ativan) • Oxazepam (Serax) • Temazepam (Restoril) • Triazolam (Halcion)	• Older adults have increased sensitivity to benzodiazepines and decreased metabolism of long-acting agents. • In general, all benzodiazepines increase risk of cognitive impairment, delirium, depression, falls, fractures, respiratory depression (especially in COPD), and motor vehicle accidents in older adults. • Risk of dependence • Avoid benzodiazepines (any type) for treatment of insomnia, agitation, or delirium. • Short and intermediate acting: May be appropriate for seizure disorders, rapid eye movement sleep disorders, benzodiazepine withdrawal, ethanol withdrawal, severe generalized anxiety disorder, periprocedural anesthesia, end-of-life care. • Fall Risk: Ability to produce ataxia, impaired psychomotor function, syncope, and additional falls; shorter-acting benzodiazepines are not safer than long-acting ones.	For anxiety: • Buspirone (Buspar) For sleep (avoid for >90days): • Zolpidem (Ambien) • Zaleplon (Sonata) • Eszopiclone (Lunesta) • Ramelteon (Rozerem) • Behavior modification
Nonbenzodiazepine hypnotics (include when continuous day supply is >90 days)	• Eszopiclone (Lunesta) • Zolpidem (Ambien • Zaleplon(Sonata)	• Benzodiazepine-receptor agonists have adverse events similar to those of benzodiazepines in older adults (e.g., delirium, falls, fractures); minimal improvement in sleep latency and duration. Avoid chronic use > 90 days	

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Central Nervous System, other	• Chloral hydrate (Noctec, Somnote)	• tolerance occurs within 10 days and risk outweighs the benefits in light of overdose	
TCAs (as a single agent or as part of a combination product)	• Amitriptyline (Elavil) • Amitriptyline/chlordiazepoxide (Limbitrol) • Amitriptyline/perphenazine (Etrafon) • Clomipramine (Anafranil) • Doxepin (Sinequan, Adapin) (>6mg/day) Imipramine (Tofranil)	• Highly anticholinergic, sedating, and cause orthostatic hypotension; the safety profile of low-dose doxepin (≤6 mg/day) is comparable to that of placebo. • worsening cognitive impairment • likely to exacerbate glaucoma • pro-arrhythmic effects • likely to worsen constipation • risk of severe constipation • risk of urinary retention • orthostatic hypotension or bradycardia • Ability to produce ataxia, impaired psychomotor function, syncope, and additional falls • May exacerbate or cause SIADH or hyponatremia; need to monitor sodium level closely when starting or changing dosages in older adults due to increased risk.	SSRIs, SNRIs
Estrogens, oral	• Conjugated estrogen (Premarin) • Conjugated estrogen/medroxyprogesterone(Prempro) • Esterified estrogen (Menest) • Esterified estrogen/methyltestostero ne (Estratest) • Estropipate (Ogen)	• Increased risk of breast and/or endometrial cancer, not cardio-protective and may increase risk of pulmonary embolism, stroke, and coronary artery disease • Avoid oral and topical patch. • Topical vaginal cream: Acceptable to use low-dose intravaginal estrogen for the management of dyspareunia, lower urinary tract infections, and other vaginal symptoms. • Evidence that vaginal estrogens for treatment of vaginal dryness is safe and effective in women with breast cancer, especially at dosages of estradiol <25 mcg twice weekly. • Increased risk of recurrence in patients with a history of breast cancer or VTE	• Topical estrogens For Hot Flashes*: non-drug therapy should be emphasized.* • Venlafaxine (Effexor) • Fluoxetine (Prozac) • Sertraline (Zoloft) • Desvenlafaxine (Pristiq) Bone Density: • Calcium* • Vitamin D*

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		• Increased risk of endometrial cancer	• Alendronate (Fosamax) • Risedronate (Actonel) • Ibandronate (Boniva) • Raloxifene (Evista) *
Hypoglycemics, oral	• Glyburide (Diabeta, Micronase, Glynase) • Chlorpropamide (Diabenese)	• Higher risk of severe prolonged hypoglycemia in older adults.	• Glimepiride (Amaryl) • Glipizide (Glucotrol) • Metformin • DPPIV inhibitors • Alternative oral hypoglycemic classes
Miscellaneous	• Methyltestosterone (Testred, Android, Methitest) • Testosterone • Thyroid, desiccated (Armour Thyroid, Westhroid, Nature-Throid) • Megestrol (Megace)	• Methyltestosterone: cardiac side effects and prostatic enlargement in men. Avoid unless indicated for moderate to severe hypogonadism. • Thyroid desiccated: cardiac adverse events; safer alternatives available. • Megestrol: Minimal effect on weight; increases risk of thrombotic events and possibly death in older adults.	<u>Testosterone:</u> N/A <u>Armour Thyroid:</u> • Levothyroxine (Synthroid) • Levoxyl
Antiemetics	• Scopolamine (Transderm Scop)	• Anticholinergic side effects: worsened cognition & behavioral problems (especially in dementia), urinary retention OR incontinence, questionable efficacy • Avoid except in short-term palliative care to decrease oral secretions.	• Ondansetron • Granisetron • Prochlorperazine
Belladonna alkaloids (includes all combination drugs)	• Atropine • Atropine/hyoscyamine/PB / scopolamine (Donnatal,	• Anticholinergic adverse effects: worsened cognition & behavioral problems (especially in dementia), urine retention, agitation & delirium	<u>Constipation:</u> • psyllium fiber (Metamucil)*

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	Barbidonna, Spasmolin, Chardonna) • Atropine/diphenoxylate (Lomotil) • Belladonna/ergotamine/phenobarbital (Bellergamin) • Clidinium/chlordiazepoxide (Librax) • Hyoscyamine (Anaspaz, Daturine, Hyomax, Levsin, Levsinex, Symax)	• Uncertain effectiveness. • Avoid except in short-term palliative care to decrease oral secretions. • Delayed diagnosis, may exacerbate constipation with overflow diarrhea, may precipitate toxic megacolon in inflammatory bowel disease, may delay recovery in unrecognized gastroenteritis • Exacerbation or protraction of infection	• Polyethylene glycol (Miralax)* • Docusate* Diarrhea: • loperamide (Imodium)* • Aluminum hydroxide*
Gastrointestinal antispasmodics	• Dicyclomine (Bentyl) • Propantheline (Pro-Banthine)	• Anticholinergic side effects: worsened cognition & behavioral problems (especially in dementia), urinary retention OR incontinence, questionable efficacy • Uncertain effectiveness. • Avoid except in short-term palliative care to decrease oral secretions. • Risk of exacerbation of constipation	Constipation: • psyllium fiber (Metamucil)* • Polyethylene glycol (Miralax)* Diarrhea: • loperamide (Imodium)* • Aluminum hydroxide*
Skeletal muscle relaxants (includes all combination drugs)	• Carisoprodol (Soma) • Chlorzoxazone (Paraflex, Lorzone) • Cyclobenzaprine (Flexeril) • Metaxalone (Skelaxin) • Methocarbamol (Robaxin) • Orphenadrine (Norflex, Orphengesic) • Tizanidine (Zanaflex)	• Most muscle relaxants poorly tolerated by older adults, because of anticholinergic adverse effects, sedation, increased risk of fractures, worsened cognition, behavioral problems (esp. in dementia), urinary retention OR incontinence	• Baclofen

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1. National Committee for Quality Assurance/Centers for Medicare and Medicaid Services. High Risk Medications in the Elderly (DAE). Available at http://www.ncqa.org/tabid/1442/Default.aspx. Accessed 7 August, 2012.
2. The Pharmacy Quality Alliance. Table HRM-A: High-Risk Medications. Available at: http://www.pqaalliance.org/files/Table-HRM-arcticle_JUN2012NL.pdf Accessed 7 August, 2012.

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