Prescribing Guidelines for Reduction in Falls and Geriatric Polypharmacy

Potentially inappropriate medications are often prescribed to the elderly population. Evidence shows that these medications are often poorly tolerated and may lead to poor outcomes in the elderly. An increased number of medications prescribed increases the risk of adverse drug events, drug-disease state interactions, inappropriate drug expense, drug-drug interactions, and poor compliance. The elderly are particularly vulnerable to adverse events related to medications due to metabolic changes, decreased drug clearance, and poor understanding of the medication regimen.

Up to 60% of elderly patients are prescribed medications that are inappropriate or lacking an indication. Gallagher, et al, found that patients 65 and older who were prescribed 6 or more medications were significantly more likely to present to the hospital with an adverse event related to an inappropriate medication. Lai, et al, investigated the effects of polypharmacy on hip fractures in patients >65 year of age. These authors again found that the OR for hip fractures increases with the number of medications taken per day, as well as with increasing age. This risk was highest in patients >85 years and in female patients, specifically.

The evidence mentioned above emphasizes the importance of being cognizant of every medication that is ordered on those patients who are 65 and older. Risks of falls and adverse events increase with each medication ordered and given. All medications should have a clear indication, and all medications should be reviewed for appropriateness on admission and throughout the hospitalization. This guideline is designed to help reduce the risk of falls, interactions, adverse events, and optimize medication options to expedite hospital discharge and prevent readmissions.

Medication	Prescribing Guidelines
Quetiapine	*Do not use for RASS less than +1
Olanzapine	*Do not use for RASS less than 0
Haloperidol	*Avoid use in TBI's for greater than 3 days
Gabapentin	*Avoid use unless patient specifically has neuropathic pain (Pain, Agitation, and Delirium guidelines only recommend it for this indication). May continue if home medication (consider reduced dose if frequent falls).
Phenytoin	*Use levetiracetam for patient's greater than 65 years old (500mg BID x 7days)
Famotidine	*Discontinue when appropriate (tolerating enteral diet outside of the ICU). Choose omeprazole or pantoprazole if a PPI is required.
Diazepam	*Most appropriate for patients < 65 years of age and without significant liver disease. *Delirium Tremens (DT): 96 hours of highest risk window (goal to start weaning benzodiazepines on hospital day 5 with a goal to stop by day 8-9). *Indications for a prn dose of benzodiazepine for DT include: hallucinations, tachycardia, hypertension, diaphoresis, disorientation. Educate nurses to not give benzodiazepines for agitation only, but for actual clinical signs/symptoms of withdrawal.
Lorazepam	*Preferred for ages 65 and older or significant liver disease (may use for ETOH

	withdrawal or benzodiazepine maintenance if home agent is inappropriate) *See above comments for duration and indications.
Alprazolam	*Should be restarted if a home medication due to short half-life and risk of withdrawal. *Do not use more than 1 benzodiazepine in a single patient (i.e. continuing home alprazolam dose, but also with prn diazepam for ETOH withdrawal).
Diphenhydramine	*Use for true allergic reaction only. Do not use as a sleeping aid.
Ziprasidone	*Oral formulation is available. May use as a secondary option for quetiapine or olanzapine failure in frontal lobe TBI's.
Sleep medications	*Pick ONE: melatonin, quetiapine, trazadone are preferred agents Avoid zolpidem or benzodiazepines.
Promethazine	*Avoid if > 65 years old
Ondansetron	*Preferred agent for nausea, but has Black Box warning that it can prolong QT interval. Monitor if requiring frequent, prolonged dosing.
Muscle Relaxers	*Cyclobenzaprine, methocarbamol, tizanidine, carisoprodol, and baclofen. Poorly tolerated in elderly due to anticholinergic effects. Do not use more than 1 muscle relaxer at a time. Do not restart home muscle relaxers unless patient has a documental musculoskeletal disorder or has new onset of specific muscle-spasmodic pain. *EXCEPTION: Baclofen- must be restarted due to risk of baclofen withdrawal (may use reduced dose if PO). *Consult CPS if the patient has baclofen pump. *Tizanidine: very effective muscle relaxer, but can drop pressure and works centrally (alpha-2 agonist); has to be up-titrated from 2mg dosage, do not start at 4mg.
NSAIDs	*Do not use more than 1 type of NSAID drug. NSAIDs are not contraindicated in TBI patients. Consult neurosurgery notes for specific time frames to avoid aspirin.
Home Antihypertensive Medications	*Antihypertensives: be careful about re-starting multiple home antihypertensives. *Restart home antihypertensive medications at a level appropriate for current vital sign trends. May be wise to start at 50% of home dose and see how blood pressure tolerates. Also, could consider choosing 1-2 home antihypertensives and titrate upward in a stepwise approach. *If acutely elevated potassium and/or SCr: hold ACE's, thiazide, and potassium-sparing diuretics (triamterene, spironolactone).

Avoid >65 yrs:

1. Tricyclic antidepressants (examples: amitriptyline, imipramine)
2. Promethazine
3. Hydroxyzine
4. Benztropine
5. Scopolamine
6. Nitrofurantoin (do not use if CrCl <60 ml/min)
7. Alpha-1 blockers: terazosin, doxazosin. Tamsulosin is preferred if able to take PO.

8. Central alpha-agonists: clonidine, guanfacine, methyldopa (clonidine should not be used as first line antihypertensive).

a. If clonidine is a home med, we should restart at appropriate dose for current vitals and wean as tolerated. Do not abruptly stop if long term.

9. Barbiturates (examples: phenobarbital)

10. First generation antihistamines (examples: chlorpheniramine, diphenhydramine)

11. Megestrol: poorly tolerated and increased risk of thrombosis

12. Anti-spasmodics (bladder) : tolterodine, oxybutinin, dicyclomine

13. Opiates: It is preferred that we do not use morphine/MS Contin in > 65 yo patients. Oxycontin is preferred if a long-acting is needed.

14. Second generation antipsychotics (example: quetiapine, olanzapine): Carry Black Box warning of increasing mortality in elderly with dementia. Avoid long-term use if at all possible.

a. If absolutely needed, dose within recommended ranges and for no longer than absolutely necessary: olanzapine 2.5-5mg, quetiapine 12.5-100mg, haloperidol 1-5mg.

b. Please consider discontinuing prior to discharge.

15. Benzodiazepines: Elderly have greater sensitivity to benzodiazepines and slower metabolism. Do not use for treatment of insomnia, agitation, or delirium.

a. May be appropriate for seizure disorders, ETOH withdrawal, palliative care, benzodiazepine withdrawal, short-term anxiety treatment, and peri-procedural anesthesia.

References

1. The American Geriatrics Society 2012 Beers Criteria Updated Expert Panel. American geriatrics society updated beers criteria for potentially inappropriate medication use in older adults. *J Am Geriatrics.* 2012; 12:1.
2. Abdulraheem IS. Polypharmacy: a risk factor for geriatric syndrome, morbidity, and mortality. *Aging Sci.* 2013; 1(2): e103.
3. Gallagher P, O'Mahony Denis. STOPP: application to acutely ill elderly patients and comparison with Beers' criteria. *Age and Aging*. 2008; 37:673.
4. Lai SW, Liao KF, Liao CC, et al. Polypharmacy correlates with increased risk of hip fracture in the elderly: a population-based study. *Medicine*. 2010;89(5): 295.