

Medication Management And Reducing Fall Risk

The Cost of Falling¹

- 1 in 4 adults over 65 fall each year, with nearly 800,000 hospitalized due to injury sustained during a fall
- In 2015, total medical costs for falls totaled over \$50 billion
 - Includes direct medical costs (i.e. fees for hospital/nursing home care, professional services, rehabilitation, medical equipment and prescription drugs)
 - Average cost of hospitalization due to a fall injury: \$30,000!
 - As our aging population continues to increase, so will the costs associated with falls and fall related injury.

The Risk Factors²

- Age
- Female gender
- History of previous falls
- Fear of falling
- Mobility impairment
- Low level of activity
- Arthritis
- Pain
- Joint disorder
- Vision impairment
- Hearing impairment
- Cognitive impairment
- Urinary incontinence
- Cardiovascular disease
- Parkinson's disease
- Postural hypotension
- Depression
- Stroke
- Dizziness
- Chronic disease
- Drug use

Medications and Falls^{2,3}

The elderly population has a higher incidence of adverse drug reactions (ADRs) due to increased risk of *polypharmacy, cognitive impairment, and physiological changes affecting pharmacokinetics of many medications.*

Most common drug classes associated with a significant risk of falls:

- Psychotropic Medications
- Cardiovascular Drugs
- Anticonvulsants
- Anticholinergic Medications
- Pain Medications

Psychotropic Medications

Anxiolytics/Sedative-Hypnotics

- Examples: Benzodiazepines (BZD), Ambien, Lunesta, Sonata
- Side effect profile: unsteady gait, cognitive impairment, delirium, dependence
- Not recommended in elderly population due to risk of adverse side effects, however the prevalence of use is 10-12%
- Nearly 80% of those listed above continue on BZD for over 2 years, despite data suggesting ability to treat does not exceed a few weeks
- Alternative treatments:
 - Anxiety: BuSpar, SSRI/SNRI antidepressants
 - Sedatives: Sleep hygiene, behavioral intervention, melatonin

Antipsychotics

- Examples: Haldol, Zyprexa, Seroquel, Abilify, Risperdal
- Side effect profile: syncope, sedation, impaired psychomotor function, loss of balance
- Newer regulations (F757, F758) give guidance regarding gradual dose reduction and limitations on PRN orders
- When in doubt-documentation is key!
- Alternative treatments:
 - Not many. Goal should be to minimize total dose for the shortest duration possible

Antidepressants

- Examples: Remeron, Trazodone, Zoloft, Celexa, Paxil, Prozac, Pamelor, Doxepin, Tofranil
- Side effect profile by class:
 - TCAs: alpha-blocking/antihistamine activity, delirium, dry mouth, constipation, urinary retention, sedation, impaired balance
 - SSRIs: ataxia, syncope, impaired psychomotor function, reduced bone mineral density
 - SNRIs: as above, plus increased incidence of orthostatic hypotension
- Most antidepressants have the potential to cause hyponatremia which has also been linked to falls
- Limiting fall risk: if prescribing, always use the lowest dose clinically needed and attempt to avoid administering with other medications with high fall risk

Anticholinergic Medications

- Examples: Sedating antihistamines (chlorpheniramine, diphenhydramine, cyproheptadine, doxylamine, hydroxyzine), Zyprexa, Paxil, TCA antidepressants,
- Side effect profile: increased confusion, delirium, constipation, urinary retention, sedation
- Alternative treatments:
 - Allergies: nasal saline, nasal steroids, Zyrtec, Allegra, Claritin

- Sleep: non-pharmacologic interventions (first-line), melatonin

Cardiovascular Drugs

Antihypertensives

- All medications in this class have potential to increase falls due to hypotension, however some classes have better safety data (HCTZ, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, long-acting calcium channel blockers)
- Alpha-blockers (i.e. doxazosin, prazosin, terazosin) and clonidine have high incidence of increased fall risk
- Alternative treatments:
 - Attempt to give alpha-blockers at bedtime to help reduce fall risk
 - Use a more selective alpha-blocker (i.e. Flomax) to treat BPH due to lower potential for orthostatic hypotension

Diuretics

- Examples: Thiazide diuretics (chlorthalidone, metolazone, HCTZ) and loop diuretics (Lasix, Bumex)
- Can cause dehydration, orthostatic hypotension, weakness due to hypokalemia or hyponatremia

Pain Medications

- Examples: morphine, fentanyl, oxycodone combinations, hydrocodone combinations, hydromorphone, tramadol
- Side effect profile: dizziness, syncope, CNS depression, sedation
- Recent studies have found a link between opioid use and an increased risks of falls and death in older adults⁴
- Recommended to use non-opioid pain medications first, however if resident requires opioids, ensure constant monitoring and de-escalation to alternative medications as soon as possible

Anticonvulsants

- Examples: Neurontin, Dilantin, Depakote, Keppra, Lamictal
- Side effect profile: ataxia, syncope and impaired psychomotor function can contribute to falls
- Check therapeutic drug levels after every dose adjustment and as required by individual institutional policy to ensure levels remain within normal limits

Additional Information

- CDC/STEADI website <http://www.cdc.gov/steady/materials.html>
- Appropriate patients may benefit from Vitamin D supplementation
- Avoid polypharmacy (the use of three or more medications) when able

References

1. Important facts about falls. CDC website. <https://www.cdc.gov/homeandrecreationalafety/falls/adultfalls.html>. Updated February 10, 2017.
2. De Jong M, Van der Elst M, Hartholt K. Drug-related falls in older patients: implicated drugs, consequences, and possible prevention strategies. *Ther Adv Drug Saf*. 2013; 4(4): 147-154.
3. Coggins, M. Medication monitor: medications that increase fall risk. *Today's Geriatr Med*. 2018; 11(4): 30.
4. Opioid use linked to increased risk of falls, death in older adults. EurekAlert! Website. https://www.eurekalert.org/pub_releases/2018-04/cmaj-oul041718.php.