**Medications that Impact Falls in Seniors**

**Risk factors for falls among older adults: A review of the literature**

Falls are a leading cause of injury and death among older adults and a significant public health issue [[1]](https://www.sciencedirect.com/science/article/pii/S0378512213000546?casa_token=nVxcNdEXKokAAAAA:7TprbbRDnfqi9dEV9y9Xj4alp7rh3_bdFBi-uqHMKjHcYJYC4G3cosLSraZsFImV_mqv8YgQjg" \l "bib0005). Falls affect one in three adults over the age of 65 annually [[2]](https://www.sciencedirect.com/science/article/pii/S0378512213000546?casa_token=nVxcNdEXKokAAAAA:7TprbbRDnfqi9dEV9y9Xj4alp7rh3_bdFBi-uqHMKjHcYJYC4G3cosLSraZsFImV_mqv8YgQjg" \l "bib0010), and 50% of adults over the age of 80 [[3]](https://www.sciencedirect.com/science/article/pii/S0378512213000546?casa_token=nVxcNdEXKokAAAAA:7TprbbRDnfqi9dEV9y9Xj4alp7rh3_bdFBi-uqHMKjHcYJYC4G3cosLSraZsFImV_mqv8YgQjg" \l "bib0015). Twenty to thirty percent of these patients will suffer moderate to severe injuries interfering with their ability to continue living in the community, require hospitalization and have an increased risk of death [[4]](https://www.sciencedirect.com/science/article/pii/S0378512213000546?casa_token=nVxcNdEXKokAAAAA:7TprbbRDnfqi9dEV9y9Xj4alp7rh3_bdFBi-uqHMKjHcYJYC4G3cosLSraZsFImV_mqv8YgQjg" \l "bib0020).

**Medications that Impact Falls in Seniors**

According to the [**Centers for Disease Control and Prevention**](https://www.cdc.gov/injury/features/older-adult-falls/index.html) (CDC), falls are the leading cause of fatal and non-fatal injuries in older adults. In fact, one in four Americans aged 65 and older experiences a fall each year.

While prevention efforts tend to focus on minimizing environmental hazards and improving mobility, another important contributing factor is often overlooked: prescription and over-the-counter medications. Of the 20 medications that are most frequently prescribed to older adults, researchers from the Karolinska Institute (KI) medical university in Stockholm, Sweden, have found that over half of these may increase fall injury risk.

**Polypharmacy in Older Adults**

**Abstract**

Polypharmacy, by definition, is the concurrent use of several different medications *(3 or more)* consumed by a person. Often these multiple medications are in the same class and are used to treat more than one chronic condition. Older individuals are often faced with issues of polypharmacy due to multiple chronic conditions and multiple providers. The risks associated with polypharmacy can lead to increased adverse effects, falls, and decreased risk of medication compliance. This paper will discuss the issues surrounding polypharmacy and provide a case example to illustrate the significance of this problem.

**Medications That Can Cause Falls**

Drugs that affect the central nervous system, such as antidepressants, hypnotics and opioids, have long topped the list of pharmaceuticals that may increase fall risk. Diuretics, constipation medications and non-steroidal anti-inflammatory drugs (NSAIDs) have also become notorious for the potential to make patients unsteady on their feet. But by tracking the medical records of more than 64,000 Swedes who’d been hospitalized due to a fall, researchers at KI uncovered surprising new links between fall injuries, medications and even [**dietary supplements**](https://www.agingcare.com/articles/dietary-supplements-for-seniors-more-is-not-always-better-133854.htm).

Möller and her fellow researchers found that the following types of prescription drugs, over-the-counter medications and dietary supplements may enhance a senior’s fall risk.

1. Antithrombotic agents (antiplatelet and anticoagulant drugs used to prevent blood clots)
2. Drugs used to treat peptic ulcers and gastroesophageal reflux disease (GERD)
3. High ceiling diuretics (like furosemide)
4. NSAIDs
5. Vitamin B12 and folic acid supplements
6. Constipation drugs
7. Calcium supplements
8. Hypnotics and sedatives
9. Analgesics and antipyretics
10. Opioids
11. Antidepressants
12. Thyroid hormones

**Falls and medications in the elderly**

**INTRODUCTION**

Falls are common in the elderly and contribute to morbidity and mortality. Elderly people are often on a variety of medications as well, and this suggests a causative relation between use of medicine and falls. However, the evidence available to support this assumed relationship is not very robust. In this article, we will discuss specifically the medications that are presumed to be associated with falls.

**DEFINING THE PROBLEM**

For elderly people aged >65 years who live in the community, the risk of falling varies from 25 to 40% a year,2,3,7,8 while for the institutionalized elderly this can be as high as 70%.9 The incidence of falls increases with age and is greater in women.10-12 At least 5% of community-dwelling elderly >65 years will suffer from a fracture related to a fall. Especially fractures of the hip result in hospital admission4 with a death rate within the following year of 20 to 30%.13,15 The same percentage of elderly people is admitted to a nursing home because of remaining disability.13,14

**AGE-RELATED CHANGES OF PHARMACOKINETICS AND PHARMACODYNAMICS**

In the elderly, the rate of absorption of most drugs administered orally is almost identical to that of younger people, but with ageing marked changes in body components affect the distribution. Body fat as a proportion of body weight increases by over 35% from the age of 20 to 70 years. There is a concurrent decrease in plasma volume of 8% with normal ageing; lean body mass and total body water decrease approximately 17%40 with an increased rate of adverse effects of both lipophilic (for example diazepam: large volume of distribution) and hydrophilic medications (high plasma concentration). Also, the metabolism of many medicines’ changes with ageing. Hepatic biotransformation is a prerequisite for drugs with limited renal clearance. There is a modest decrease in the efficiency of phase I reactions (oxidative and hydroxylation processes), reactions generally mediated by the mixed-function monooxygenase system (cytochrome P-450 system). In contrast, phase II reactions (by conjugation enzymes and transferases) are generally unaffected and in older vs younger patients’ drugs metabolized by phase II processes only are preferable. Drugs known to have a strong ‘first pass’ effect, such as metoclopramide and opiates, should be used in low doses. Renal drug excretion includes glomerular filtration, tubular secretion, and in a varying degree, tubular reabsorption as well. The half-life of a drug is directly related to the volume of distribution and inversely related to its clearance (metabolism and excretion). In the majority of elderly people renal function is diminished due to a reduction in both renal blood flow and number of functional nephrons with an increased half-life for drugs that depend on renal function for elimination.41 Insight into the effects of ageing on pharmacodynamics, probably through disease-related changes in target organs, diminished reserve capacity and changes in receptor function of end organs, is limited.42 As an example, the plasma concentration of diazepam required to achieve a certain level of sedation is much lower in the elderly than in subjects aged 30 to 50 years. An increased sensitivity has also been shown for opiates, anticholinergic and antihypertensive drugs and dopamine agonists. In contrast, the susceptibility of older vs younger patients for -blockade and insulin40 is reduced. From this viewpoint, data from literature concerning antipsychotics, (tri)cyclic antidepressants, anticonvulsive and cardiovascular medications are discussed.

**SOURCES:**

Falls and medications in the elderly

Page 19: <https://www.njmonline.nl/getpdf.php?t=i&id=67#page=19>

Medications that Increase Fall Risk in Older Adults

<https://www.agingcare.com/Articles/medications-increase-fall-risk-in-older-adults-171464.htm>

Polypharmacy in Older Adults

<https://pubmed.ncbi.nlm.nih.gov/26529442/>

Medications and Falls in the Elderly

<https://sandiego.networkofcare.org/content/client/4/Medication%20and%20falls%20elderly.pdf>