



## Balance and Falls in the Older Adult

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One of the leading health concerns for people over the age of 60 is falling, which is often related to balance problems. Each year millions of adults fall and one in five of those falls leads to serious injury (CDC) <sup>1,2</sup>. One of three adults 65 or older fall, but only 50% tell their doctor. The percent of people falling increases from 40% to 65% to 82% with each decade after age 65 years.

The consequences of falls can be substantial; between 12% and 67% of elderly adults who fracture a hip die within one year. Even if a bone is not fractured during a fall, falls cause pain and injury while reducing future mobility and quality of life. As a result, major scientific efforts are devoted to determining the causes of falling in older adults in an attempt to reduce this significant health hazard.

### CAUSES OF IMBALANCE IN OLDER PEOPLE

Balance in walking and standing is dependent on many factors. Good balance requires reliable sensory input from the vision, vestibular system (the balance system of the inner ear), and proprioceptors (sensors of position and movement in the feet and legs). The elderly are prone to a variety of diseases that affect these systems, including:

cataracts, glaucoma, diabetic retinopathy, and macular degeneration, which affect vision; peripheral neuropathy, which impairs proprioception in the feet and legs; and degeneration of the vestibular system.

Balance is also dependent on muscle strength, joint mobility, and healthy feet. A sedentary lifestyle, painful arthritis or diseases of bones and muscles can compromise strength, mobility, and the base of foot support.

Balance control also depends on healthy function across many brain areas. The brain needs to process and interpret sensory information, select appropriate balance strategies, and adapt and learn new strategies with practice. As we age, brain processing can slow down, which results in slower balance responses. People with cognitive problems also have balance problems, showing the importance of higher level brain processing in balance control.

Because balance is a complex function, there is often no single identifiable cause of falls in an older person. However, older people with chronic dizziness or imbalance are two to three times more likely to fall in comparison with older people who do not experience these

problems.<sup>1</sup> Experiencing a previous fall in the last year is the highest risk factor for a future fall.

**Risk-Factors for Falls Risk\***

Fell in past year	5X
Weakness	4.4
Peripheral Neuropathy	3.0
Balance	2.9
Slow Gait	2.9
Cane	2.6
Vision Problems	2.5
Arthritis	2.4
ADL Deficit	2.3
Depression	2.2
Cognitive decline	1.8
Ages >80	1.7
> 5 medications	1.7

\*indicates the likeliness of falling, e.g. "5 times more likely."

**DIZZINESS**

Symptoms of a sense of lightheadedness or disorientation (dizziness) and/or a mild to violent spinning sensation (vertigo) can have a variety of causes: vestibular (inner ear) disorders, central nervous system disorders (such as stroke), cardiovascular problems (including low or high blood pressure), low blood sugar, infection, hyper-ventilation associated with anxiety attacks, medication side effects or interactions between drugs, or an inadequate or poorly balanced diet. Dizziness, or an abnormal sense of spatial orientation, should not be confused with disequilibrium or a sense of imbalance or unsteadiness.

A thorough evaluation by a physician is usually necessary to help sort out these different possible causes of dizziness to arrive at a correct diagnosis. This task can be even more complicated when multiple problems are present. In such cases, the trouble in any one system may not be severe, but the combined effects may be enough to cause a serious problem with balance. For example, an elderly individual with age-related, mild degeneration in vestibular function may not complain of dizziness until they develop postural hypotension, or light-headedness when quickly moving from sitting to standing due to a new medication, low blood pressure or a cardiovascular problem. In fact, slow, age-related loss of vestibular function is usually not associated with dizziness, although it is associated with imbalance and falls. However, peripheral neuropathy resulting in poor positional sense in the feet and legs results in more severe balance problems and falls than vestibular problems, although a combination of both vestibular and proprioceptive deficits can have an even more profound effect on balance control.

**THE AGING VESTIBULAR SYSTEM**

Most people are familiar with the problems associated with the aging of senses such as vision and hearing. However, the vestibular system is another sensory system that gradually begins to lose function with age, potentially contributing to imbalance and falls. (See VEDA's article titled *Vestibular*

*Function in the Older Adult* for more information.)

## PRECAUTIONS

Although the problem of imbalance in older persons can be complex, there are a few simple precautions that everyone can follow to help ensure an active old age. Balance in standing and walking is a skill that older adults can learn to maintain and/or improve, and it is dependent on good general physical condition. Therefore, sound nutrition and health habits—including regular exercise, such as walking, strength training and participating in Tai Chi—can go a long way toward preventing balance trouble<sup>2</sup>.

In older people, a regular physical examination by a doctor familiar with the problems of aging, such as a geriatrician, can help identify and correct potential problems before a serious fall. Having a physician and pharmacist work to minimize the number of medications an older person is taking can help reduce potential side-effects and interactions causing dizziness and imbalance, and has been shown to reduce falls. Taking good care of the feet by wearing good shoes and maintaining healthy nails and skin is particularly important for good balance. In addition, making sure that the older person's environment is safe (with good lighting, secure footing, clear walkways, handrails and anti-skid devices in bathrooms, etc.) can help prevent falls and their attendant injuries.

**A tendency to fall and symptoms of dizziness should never be dismissed as unavoidable consequences of aging but may be important signs of a condition that might be cured or controlled.** The elderly have a higher risk of contracting many different kinds of diseases. As a result, the average older person is more likely to have a disease that interferes with balance than a younger person. The vestibular system should be ruled out as a source of these symptoms.

The ability to move about freely is an important factor in the quality of life for both younger and older people, and a healthy balance system is vitally important to freedom of movement.

## REFERENCES

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2. Sterling DA, O'Connor JA, Bonadies J. Geriatric falls: injury severity is high and disproportionate to mechanism. *Journal of Trauma-Injury, Infection and Critical Care* 2001;50(1):116-9

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