

# Orthopaedic Observations

*A Matter of Medicine...*

*TM Pending*

## Are You At Risk For Falling?

By Michael DeChello, MS, PT



There continues to be a growing concern regarding the number and frequency of falls among the older population. Are you concerned you are having increasing difficulty with your balance? Do you find yourself or a family member more unstable on their feet, lose their balance more often or have fallen, when in the past would have been able to avoid a fall?

Unintentional injuries are the sixth leading cause of death in individuals over age 65 and are the leading cause of death in people over age 85. The majority of these deaths are related to falls. The fear of falling is also common in older adults who have or have not sustained a fall. Estimates range as high as 73% of older adults have a fear of falling, which may lead to a decrease in activity levels and an increased risk of falls.

In efforts to reduce the risk of falling related to balance problems, we must first understand the components of balance. The three main components or systems that work together to help maintain balance and postural control are vision, the vestibular system and the somatosensory system. Vision provides information on relative body/head position in space. The ocular reflex maintains gaze stabilization during head movements. The vestibular system provides information relative to head position in space and head relative to the body. The vestibular reflex stabilizes the head and body and activates skeletal muscles and makes postural adjustments. The somatosensory system provides information on body to environment contact. For example, the receptors on the bottom of your feet provide information up to the brain when you are on uneven terrain and helps you make adjustment to prevent falling.

In the normal aging process there are physiological changes that occur in these three systems. Vision can be affected by decreased depth perception, decreased acuity, cataracts, glaucoma and macular degeneration. The vestibular system is affected by the degeneration of the tiny hair cells in the inner ear, specialized nerve cell loss, decreased nerve conduction velocity and nerve damage. The

somatosensory system is affected by the loss of specialized nerve cells in the cerebellum, decreased position and vibratory sense, peripheral neuropathies and joint degeneration. Not all of these changes are inevitable with aging, but are the result of pathologies often seen in older persons. In addition, there are extrinsic factors that have an effect on balance. The intake of various medications can affect balance, sometimes many medications at the same time. Other common extrinsic factors are poor lighting, loose carpets, clutter, uneven stairs and sidewalks, and the weather. However, the greatest single intrinsic factor is the presence of muscle weakness for increasing the likelihood of falling. There is a 4.4 fold increase in falls related to muscle weakness.

There are numerous research studies that have been done that show the benefits of exercise in the older population. More specifically, the research supports seniors who take part in training regimens that involve deliberate (slow), transitional, multi-planar movements that move joints through a significant ROM show significantly improved strength, fitness and balance.

There are simple tests a physical therapist can perform to evaluate if someone is at an increased risk for falling. Some of the simple tests that can be done require very little, if any measuring equipment. Tests such as the Berg Balance Test, Tinetti Test, Timed Up and Go, and the Functional Reach Test to mention a few are specific for balance and gait. Physical Therapists also check joint range of motion, muscle strength and gait quality and how restrictions and weakness can impact balance. After identifying someone who is at a risk for falling, a treatment plan can be devised. A typical treatment plan includes stretching tight joints, muscles and soft tissue. Developing a dynamic and static home stretching program is very important. A fall reduction program also consists of challenged balance activities, functional exercise/activities, weight shifting activities, gait training and resisted strength training. All of these interventions will challenge the vestibular system and help decrease the effects of age on muscle strength.

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As the population lives longer, these systems will continue to be compromised at greater incidence making it even more important to engage in an exercise program as a preventative measure or slowing the rate in which these changes occur.

If you would like further information on how to tell if you are at increased risk for falling and what can be done, please contact Michael DeChello @ 203-865-6784.

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