



GORDON
CENTER FOR BALANCE, MOBILITY
AND WELLNESS



**HEALTHY BALANCE
IS IN YOUR CONTROL**

Perspectives on Fall Prevention

“National data indicate that falls are the largest single cause of restricted-activity days among older adults; are a leading precipitating cause of nursing home admissions; and account for six percent of all medical expenditures for persons 65 years of age and older.”

(Annals of Internal Medicine, 2001)

According to the U.S. Center for Disease Control:

- » Every year one-third of all people 65 years and older will experience falls.
- » Among those who fall, 20 to 30 percent will fracture a hip.
- » **The total cost of caring for falls in those age 65 and older exceeds \$20 billion annually.**

HOW MIGHT A BALANCE PROBLEM AFFECT ME?

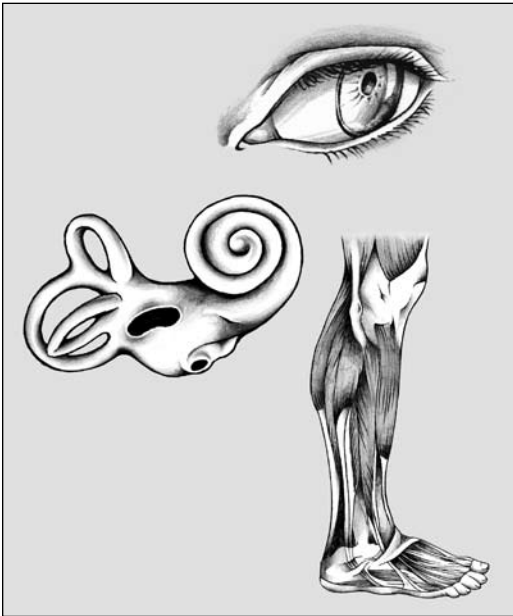
Maintaining balance is essential for carrying out activities of daily living such as washing and dressing, getting in and out of the car and walking up stairs. Not only might a balance problem affect your ability to carry out these and other tasks, it also puts you at an increased risk for falls. If not addressed, this increased fall risk may lead to more severe health consequences. People with a balance problem often become inactive due to a fear of falls. Unfortunately, inactivity often makes a balance problem worse.

HOW DO I CONTROL MY BALANCE?

Balance is controlled by complex processes requiring the cooperation of three main body systems.

First, your sensory system is essential for providing information about bodily motion as well as your body's position in space. There are three primary components of your sensory system that are critical for balance (see image below).

- » Vision provides information about position and movement of your head with respect to the environment.
- » The vestibular system (inner ear) detects position and motion of the head in relation to gravity and helps keep your head, eyes and body oriented during movement.
- » Your somatosensory system (special receptors in your muscles, tendons and joints) informs you of where your limbs and body are in space.



Sensory System: vision, vestibular and somatosensory

The **second** major component involved in maintaining your balance is your central nervous system. The central nervous system, including the brain, processes and organizes all of the sensory information it receives and then sends messages to the **third** system required for balance, your musculoskeletal system. Here muscles of the ankle, hip and neck contract to keep you upright and maintain your center of gravity over your feet.

These three systems are so intricately connected that when all are working appropriately you require no conscious effort to maintain balance.

WHY AM I EXPERIENCING A BALANCE PROBLEM?

Problems with balance are NOT an inevitable consequence of aging! However, as you age, your risk increases for developing a deficit in one or more of the three primary systems for balance. For example, abnormalities in the inner ear can lead to dizziness, which may result in unsteadiness on your feet. Poor eyesight can lead to compromised information about your environment. Neuropathies (loss of sensation) in your lower legs and feet can decrease the amount of information your brain receives about your body's position in space. Neurological conditions such as stroke, Parkinson's disease and multiple sclerosis interfere with the central nervous system's processing of information necessary for good balance. Joint problems such as arthritis may cause pain during movement. This often results in a decrease in daily activities, ultimately leading to muscle weakness and joint stiffness. Muscle weakness increases your chance of falling because your muscles may not react with the proper speed and force to keep you steady. Deficits can occur in more than one system at a time. Often it is not a single problem but the accumulation of several small problems in multiple systems that leads to unsteadiness and increased fall risk.



HOW WILL THERAPY IMPROVE MY BALANCE?

A fall risk assessment by a physical therapist is the first step in fall prevention. Your therapist will help determine the underlying cause of your instability. He or she will create a treatment plan designed to modify the negative effects that result from changes within the systems which maintain your balance. Much like you might weight train to strengthen a specific group of weak muscles, your therapist will instruct you in specific exercises to challenge your weaker components of balance. You will receive highly customized therapy unique to your specific limitations and capabilities. Your therapist can also teach you strategies to compensate for your balance deficits. This helps to ensure safe, independent mobility. Education regarding your condition and progress is another key part of your therapy program.

WHAT OTHER PRECAUTIONS CAN I TAKE TO MINIMIZE MY RISK OF FALLING?

Factors in the environment also influence your risk for suffering a devastating fall. First, assess the environments you are often in. Then take steps to make those environments as safe as possible. Since 60 percent of falls occur in the home, and 50 percent of falls are due to slipping or tripping, making your home safe is the place to start.

- » Install handrails and slip-free mats in your bathroom.
- » Ensure adequate lighting throughout your home, including night lights.
- » Eliminate throw rugs, stray cords and clutter.
- » Install handrails on your stairs if you don't have them already, and *always* use them.
- » Reorganize your kitchen cabinets, placing things you use most often at counter height to avoid reaching overhead. If you have to reach overhead, take a step back first to widen your base of support.
- » Invest in comfortable, sturdy shoes to improve your safety; rubber-soled shoes with a thin tread are best.
- » Use a walking stick or cane—especially in unfamiliar environments—to help compensate for loss of sensation in your feet and ankles.
- » Take special care in hazardous environments—such as curbs, wet surfaces and crowded areas—to help prevent a dangerous fall.

IT IS IMPORTANT TO KNOW YOUR OWN HEALTH.

- » Vision is a key part of balance; schedule regular eye exams.
- » Discuss with your doctor the potential side effects of medications that may be detrimental to your balance.
- » Get plenty of calcium to maintain strong bones. The USRDA recommends 1,200 milligrams of calcium for all adults over age 50.

THERE ARE SPECIFIC MOVEMENT STRATEGIES YOU CAN USE TO AVOID PUTTING YOURSELF AT RISK FOR A FALL.

- » Step back to widen your base of support when reaching or lifting.
- » Turn slowly and carefully, especially if you have a problem with dizziness.
- » Rise slowly from your chair and wait a few seconds before walking. This is especially important when getting up in the middle of the night or first thing in the morning.
- » Avoid doing too many tasks at once. To decrease your risk for falling, concentrate on the primary task of moving safely.

MAINTAINING PHYSICAL ACTIVITY IS ONE OF THE BEST MEASURES YOU CAN TAKE TO IMPROVE YOUR BALANCE AND PREVENT FALLS.

- » A regular exercise program will improve strength, flexibility and coordination, which are all necessary for maintaining balance, especially in unfamiliar environments.
- » Walking, tai chi, dancing, tennis and golf are all good choices and are especially good for maintaining bone strength because they are weight-bearing exercises.
- » Prolonged sitting can negatively affect your balance. Do not sit for more than 45 minutes without getting up to stand or walk.

TAI CHI

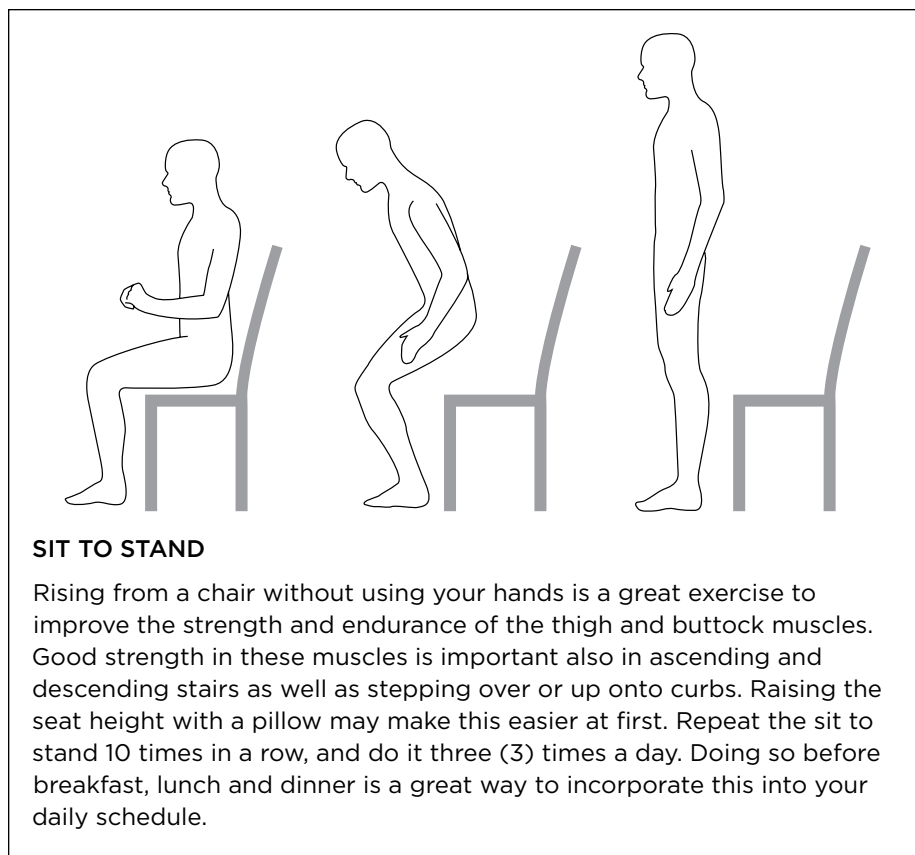
Recent studies have confirmed what health professionals have suspected for years: tai chi is a beneficial exercise for older adult populations. The benefits appear to be twofold. In a 2003 study from Emory University, patients enrolled in a tai chi class had a 42 percent lower risk of falling than patients who only received wellness education.

Other potential benefits of tai chi include increasing your ability to focus attention. Since divided attention is a risk factor for falls, learning to focus attention better on a specific task will help prevent falls.

BALANCE: USE IT OR LOSE IT

Your therapist will prescribe specific exercises to challenge your balance systems. It is essential that you consistently perform the exercises and stay as active as you can to enjoy the maximum benefits of therapy and maintain the healthiest balance possible. Here are some sample exercises that promote healthy balance.

PLEASE NOTE: These exercises should be performed next to a wall or countertop so you have something for support if necessary. Do not try these exercises for the first time when alone. Exercises are intended to be challenging but doable.



SENSORY (ANKLE) ENHANCER

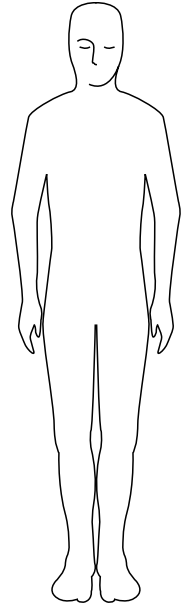
Closing your eyes while standing promotes the use of receptors located in the feet, ankles and lower legs in order to maintain stability and proper orientation of the body.

Stand with feet together. Close eyes and visualize upright position. If this is too difficult, perform with your eyes open to start.

- » Hold 30 seconds
- » Repeat three (3) times per session
- » Do three (3) sessions per day

To make this exercise more challenging:

Turn head side to side or up and down; try this first with your eyes open. If it is too difficult, spread your feet apart two to three inches.



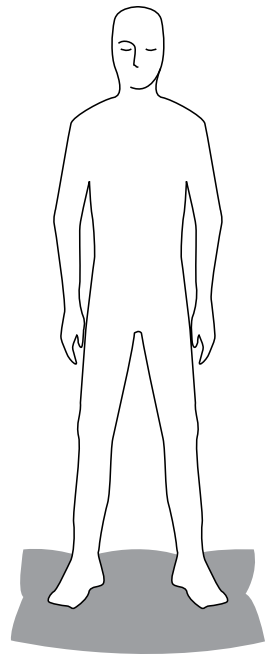
SENSORY (INNER EAR) ENHANCER

Standing with eyes closed on a cushion increases the use of information from the vestibular system (inner ear) in order to maintain stability and proper orientation of the body.

Stand on a cushion. Start with feet apart and eyes open. If this is too easy, try closing your eyes or bringing your feet closer together.

- » Hold 30 seconds
- » Repeat three (3) times per session
- » Do three (3) sessions per day

While standing with eyes closed, count backward from 100 by three's or recite a poem.



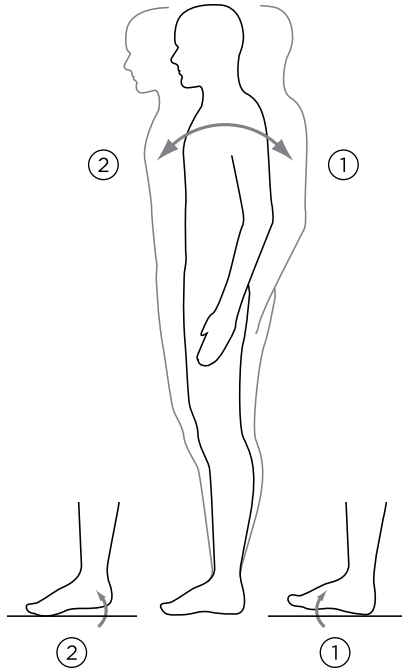
WEIGHT SHIFT

This exercise strengthens the ankle muscles, which are responsible for controlling movement of your center of gravity.

Stand with feet shoulder-width apart. (1) Slowly shift weight backward until toes begin to rise off the floor. Return to starting position. (2) Shift weight forward until heels begin to rise off the floor. Return to starting position again.

- » Hold each position three to five (3-5) seconds
- » Repeat 15 times per session
- » Do two to three (2-3) sessions per day

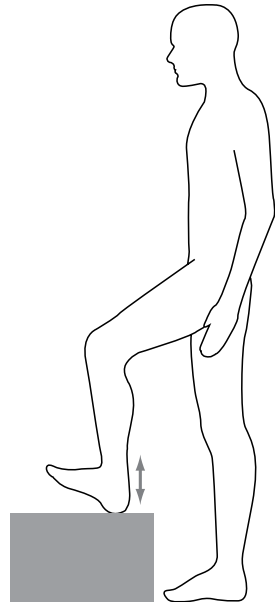
Once you can do this easily, try performing the exercise on a cushion.



STAIR TAP

While standing in front of a bottom stair, alternately tap right and left heel to stair for one minute. Lightly hold rail for support.

To make this exercise more challenging:
Gradually decrease hand support.



STAYING ACTIVE

Poor balance and increased fall risk are not a necessary part of aging. Declines in balance are often accelerated because of changes in lifestyle and sedentary physical activity levels. However, since balance is a learned skill, it may be improved and maintained with appropriate exercise, motivation and compliance—it's in your control.



CREDITS

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FURTHER INFORMATION AND RESOURCES

HOME SAFETY

www.nsc.org/issues/fallstop.htm

www.mnsafetycouncil.org/seniorsafe/falls/index.cfm

EXERCISE

www.nihseniorhealth.gov/exercise/toc.html

www.niapublications.org/exercisebook/exercisebook.asp

www.weboflife.ksc.nasa.gov/exerciseandaging/toc.html

www.helpguide.org/life/senior_fitness_sports.htm

FALL PREVENTION

www.fallprevention.org/index.htm

www.cdc.gov/ncipc/pub-res/toolkit/toolkit.htm

HELP GUIDE SENIOR FITNESS

www.helpguide.org/aging/senior_fitness.htm

AGING

www.ncoa.org/index.cfm

www.nia.nih.gov

www.americangeriatrics.org

HEALTH INFORMATION

www.nlm.nih.gov/medlineplus/falls.html

www.vestibular.org

www.balanceandmobility.com

www.balance-and-dizziness.com

LOCAL ORGANIZATIONS

North Shore Elder Services

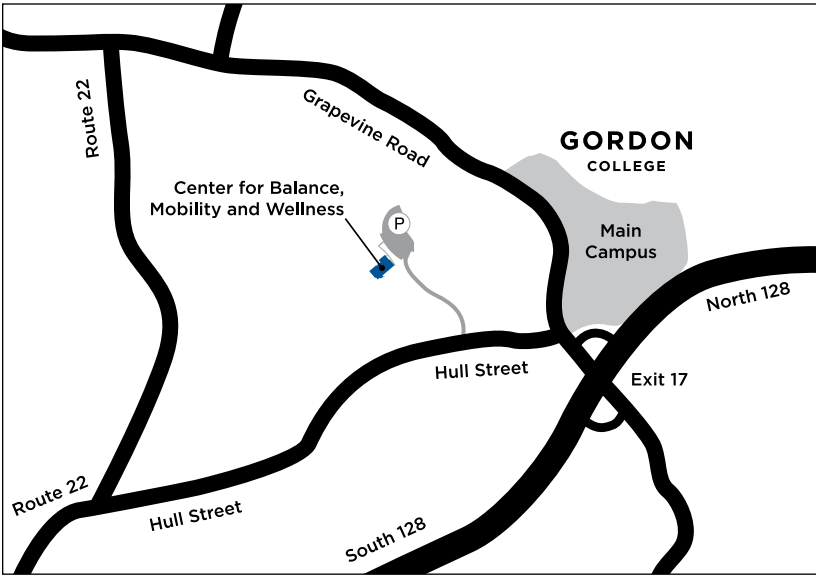
978 750 4540

Massachusetts Association Council on Aging

617 457 5880

American Geriatric Society

212 308 1414



DIRECTIONS: FROM POINTS SOUTH

- » Stay on Route 95 North until it separates from Route 128.
- » Take Route 128 North towards Gloucester, passing through Peabody, Danvers and Beverly.
- » Take Exit 17, Grapevine Road.
- » Turn left at end of ramp, cross over 128.
- » Turn left onto Hull Street.
- » Turn right into the Brigham Athletic Complex parking lot—26R Hull Street.

More directions available online at www.gordon.edu/directions.



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