

Balance

If rock hopping or log crossing triggers panic, maybe you need to fine-tune your balancing act.

Walking genes? Does a DNA imbalance doom you to scooting across downed trees on their butts?

It turns out that inheritance doesn't play a role in balance, according to Tonya Toole, Ph.D., a professor in the Department of Food, Nutrition, and Movement Sciences at Florida State University in Tallahassee, who specializes in human motor control. "Many factors determine good balance, including age, muscular strength, use of visual cues, range of motion in the joints, and kinesthetic perception, for starters."

To understand how all these factors work in concert, think of one of the most basic laws of physics: For every action there is an equal and opposite reaction. Now, translate that principle to your bodily movements. As soon as you start walking, your center of balance shifts and your muscles, tendons, and ligaments make instantaneous adjustments to counteract that movement. In essence, with each step you're losing, correcting, and regaining your balance.

But how does your body know to flail the left arm when a creek bank gives way under your right foot? Simply put, your body automatically gathers information from the inner ear, from visual cues, and from a finely tuned system known as proprioception, which constantly monitors the location of all your various body parts.

When all these cogs of the balance machine are in optimum working order, our bodies have an amazing ability to negotiate obstacles and stay upright in the face of sudden surprises. Start adding variables like unstable footing, poor visibility, or fatigue, and maintaining your balance becomes more challenging. Pile on a 45-pound backpack that shifts your natural center of gravity, and your body's mechanisms for maintaining equilibrium are really put to the test.

"The center of mass is pulled back" by a weighty pack, says Dr. Toole, who's an avid hiker, "making balance more difficult when you need to take larger steps up and down, such as when maneuvering over rocks." That's why maintaining strong torso and leg muscles is particularly critical to good balance, she adds.

Most people know they're more likely to stumble at the end of a long day when their legs are tired. According to Dr. Toole and other researchers, other factors can also contribute to falls and balance deterioration, including medication you may be taking, heart disease, an inner ear inflammation, poor proprioception, and the glasses you may be wearing (such as looking through bifocals while walking on the trail). Even lack of confidence can hamper your body's attempts to stay on top of things.

So how can you tell if your balance needs a tune-up? Frequent stumbling over roots and rocks in the trail is one clue, says Dr. Toole. Or try the "test" suggested in "Simple Steps To Better Balance." Regardless of how you fare, bear in mind that researchers believe most of us reach our

equilibrium zenith sometime in our teens. After 30, we're all playing beat the clock, so keeping your balance in top shape is essential to feeling confident and staying injury-free.

Simple Steps To Better Balance

First, see where you stand, so to speak. Stand with one foot off the floor and not touching the other leg, arms folded across your chest. Do this for more than 30 seconds and you've passed the most basic balance test. Try this exercise with each leg raised and with your eyes closed. Then try it pointing your raised leg to different compass points, or while bouncing a ball, or wearing a backpack and standing on a foam sleeping pad. If you have trouble, repeat the exercise three times a day. Time yourself periodically to see how you're improving.

Opt for boots with stiffer soles instead of those with more flexible soles. One study revealed that thick, soft soles common in "walking shoes" have a negative effect on balance.

Improve your overall fitness, including strength, cardiovascular endurance, and flexibility. Lower-leg strength is especially critical, and Dr. Toole suggests the following at-home exercises: **Ankle raise.** Stand on the edge of a step, allowing your heels to drop below the step. Raise your body by standing on your toes, then lower your heels below the step. Do this 10 to 12 times and rest. **Knee extension.** Place ankle weights around one ankle. Sit in an upright chair and raise your leg to a count of four until it's horizontal with the floor. Slowly lower, and repeat 10 to 12 times. Do three or four sets per leg. **Knee flexing (hamstring).** Stand with feet together and weights around one ankle. Hold onto a countertop or table, and lift the weighted foot behind your back by bending the leg at the knee. Raise the foot to a count of four and lower to a count of two. Put the weights on the other ankle and repeat. Do this 10 to 12 times per leg. Rest, and then do one to three more sets on each leg. You should be able to lift two-thirds of the weight you did with the knee extensions.

Make sure the weight of your loaded pack is balanced both front-to-back and side-to-side.

If you're really serious about achieving better balance, try tai chi or hatha yoga. One study of senior citizens suggests that the slow, graceful movements of tai chi, an ancient Chinese fitness exercise, significantly improves balance and coordination. Check fitness and community centers for classes in both tai chi and yoga.