Balance After Traumatic Brain Injury

This factsheet looks at common balance problems after TBI and describes treatment options.

People with traumatic brain injury (TBI) often have problems with balance. About half of people with TBI have dizziness and loss of balance at some point in their recovery. When you are dizzy, you may have vertigo (the feeling that you or your surroundings are moving) and feel unsteady. You may also feel faint or lightheaded.

Many factors determine how bad your balance problem is, including:

- How severe your brain injury is.
- What part of the brain was injured.
- If you have other injuries along with your TBI. For example, in a car crash, you could have a TBI, neck injury, and broken ribs and legs. All of these injuries will affect your ability to keep your balance.
- Some medications can have an effect on your balance.

What is balance?

Balance is the ability to keep your body centered over your base of support. When standing, your base of support is your feet. When sitting, your base of support is your butt, thighs, and feet. Many factors affect your ability to keep your balance. These factors include your physical strength and coordination, your senses, and your ability to think.

Most people can control the movement of their body for a time before they lose their balance and need to change their posture or take a step to keep from falling. Changing your posture or taking a step to keep your balance before, during, or after movement is a complex process; TBI may affect this process.

Why is balance important?

Falls are one of the main causes of TBI. Falls affect children (younger than 17) and older adults (older than 65) the most. Improving balance can help prevent TBIs.

If you have poor balance after a TBI, you have a high risk of falling. Falls can cause another TBI or a broken bone. Keeping your balance while sitting and standing is important for doing daily activities. These activities include walking and self-care tasks like bathing, using the toilet, and dressing. Poor balance can keep you from being able to play sports, drive, or work.

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Diagnosing balance problems

Several of your body's systems are involved in keeping your balance. Many health care providers diagnose and treat balance problems. These may include doctors who focus on physical medicine or rehabilitation (physiatrists) or doctors who focus on the nervous system and brain (neurologists). Other providers may include doctors who focus on the ears, nose, and throat (otolaryngologists) and physical therapists (PTs). Your doctor may start by looking at the medicines you take. Medicines are a common cause of balance problems.

PTs and occupational therapists (OTs) use balance tests to identify specific problems and assess your risk for a fall. These tests also measure and track your progress with balance.

What are some common causes of balance problems after TBI?

Medicines. Many medicines can make you feel dizzy, lightheaded, and off-balance. These include antibiotics, tranquilizers, and blood pressure, heart, and seizure medicines. Ask your doctor if any of the medicines you take may be causing dizziness or balance problems. A change in medicine or dosage may fix the problem.

Postural hypotension. If your blood pressure drops when you stand or sit up quickly, you may feel lightheaded and dizzy. This can happen when you stand up quickly from sitting on the toilet or a chair or when you get out of bed. Taking your blood pressure while lying, sitting, and standing may help diagnose balance problems caused by your blood pressure.

Vision problems. Eyesight is one of the key senses you need to keep your balance. Problems such as double vision, visual instability, partial loss of vision, and problems with depth perception can make your balance worse.

Inner ear problems. Your inner ear has tiny organs that help you keep your balance. This is called the vestibular system. Your inner ear has three loop-shaped structures called semicircular canals. These canals contain fluid and have fine, hair-like sensors that monitor the rotation of your head. Your ear also has other structures called otolith organs that monitor the linear movements of your head. The otolith organs contain crystals that make you sensitive to movement and gravity. If your TBI damages your vestibular system, you may have balance problems, dizziness, or a sudden feeling that you're spinning or that your head is spinning.

Problems with your ability to feel things. Nerves in your feet send messages to your brain that help you keep your balance. If your TBI damages these nerves, your brain may not get the messages it needs. In this case, your brain may need to rely more on your eyesight and inner ear to keep your balance.

Brain stem injury. A traumatic injury to the brain stem and cerebellum (the parts of the brain that control movement) can make it hard for you to walk and keep your balance.

Mental health issues. Some people with TBIs have anxiety, depression, or a fear of falling. These issues can cause or increase balance problems. Practitioners all this psychogenic dizziness.

Treatment options

Balance problems have many different causes. Each cause requires a different treatment. Your doctor, PT and OT, and other health care providers will work with you to find out and treat the different causes. Treatment needs to be tailored to your needs. It should also challenge you without compromising your safety.

How can you improve your balance?

- Be cautious when working on your balance. Make sure you work at the right level to avoid falling when no one is around. A PT or OT can help design a program that is safe for you to practice at home.
- Increase your strength and flexibility. You can do stretches for your ankle and hip muscles. Other exercises will help strengthen your legs. These include mini squats, toe raises, or standing leg lifts. Go to www.nia.nih.gov/Go4Life for more information about these exercises. You can also talk to your doctor or PT about what you can do.
- Find your limits in balance. You can do this by moving your body over your feet as far as you can without lifting your feet. This will help you develop strategies to keep from losing your balance. You can also practice movements that allow you to move from one position to another. These movements include going from sitting to standing, reaching above your head to get something off a shelf, or picking up something on the ground.
- Practice standing or walking in different conditions. Practice standing with your eyes closed. This will decrease your dependence on using your vision for balance. Stand on a pillow; this will improve your ability to use your vision for balance. Change how far apart your feet are; bring them closer together or in front of one another. You can also stand on one leg.
- Practice activities that will improve your balance while walking. These include walking longer distances; walking and keeping up with someone else while talking; walking over different surfaces, such as on grass and sidewalks; and walking in crowded places such as the grocery store.
- Try a balance program that is based on evidence and designed for groups. Examples include A Matter of Balance, or the Otago Exercise Program. These programs may be available in your community.

How quickly can your balance improve?

The extent of your injury and your health status before your injury determine how quickly your balance problems will get better. Some balance problems can be treated effectively in one or two treatment sessions; others can take weeks, months, or years.

Research shows that:

- Most people with a TBI can walk on their own within 3 months of their injury. While most people walk again, many have problems moving quickly. They do not have the balance they need to return to activities such as running or sports.

With hard work, people with TBI can continue to improve their balance for many years after injury. But balance problems are more common in people with TBI than in people without TBI.

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Authorship

Balance After TBI was developed by Michelle Peterson, PT, DPT, NCS, and Brian D. Greenwald, MD, in collaboration with the Model Systems Knowledge Translation Center.

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