

Dizziness and Balance

Balance is the body's ability to maintain your center of gravity over your base of support. Balance is important for us to be able to move through our environment safely. Center of gravity is the point where the weight of a person is concentrated. It varies slightly depending on each person's body structure.

Sensory input that helps us maintain our balance:

- Vestibular – inner ear
- Sensory (Somatosensory) – joints, tendons, muscles, skin receptors
- Visual – eyes

You may be able to balance if you have two to three of the sensory systems available to provide information. If you have only one system available, your ability to balance will be reduced significantly.

Signs and symptoms:

- Frequent falls
- Injury to joints/muscles/bones
- Limited ability to engage in leisure activities
- Limited ability to return to work
- Unsteady with movement
- Increased need for caregiver supervision at all times.

Other factors that may cause dizziness:

- Medications
- Metabolic changes
- Some cervical spine injuries
- Panic disorder or anxiety
- Migraines
- Blood pressure changes

The **vestibular system** has two important functions:

- Provides information to the brain and muscles to help you maintain balance
- Provides information to the brain and eye muscles to help you see clearly when your head is moving.

The vestibular system is important for us to move safely through the world. A problem anywhere in the vestibular system, including nerve pathways that carry information and the areas of the brain that receive information, can cause dizziness, problems with balance and/or problems with seeing clearly when your head is moving.

Dizziness and Balance

If there is a problem in the vestibular system, there are exercises and techniques that can help decrease dizziness, improve balance and improve sight when moving.

Individuals with brain injuries who have vestibular involvement may complain of:

- Dizziness with rolling over in bed, lying down, sitting up, standing up or walking
- Loss of balance frequently or loss of balance with specific activities or movements
- General complaints of dizziness

Causes of Dizziness/Balance Disorders

Vestibular Ocular Reflex (VOR)

The VOR is responsible for the ability to see clearly. It moves your eyes in the equal and opposite direction of the head. Any interruptions along the nerve pathway to your eye muscles can cause a change in the VOR.

- Signs and symptoms:
 - Complaint of dizziness when walking or moving
 - Complaint of dizziness in busy environments
 - Complaint of dizziness and/or blurred vision when trying to read

Benign Paroxysmal Positional Vertigo (BPPV)

- BPPV is not life threatening. It occurs suddenly and is related to position changes.
- BPPV occurs when one of the crystals in the inner ear gets knocked loose and drops into one of the canals in your ear.

Vertigo vs. Dizziness

- Vertigo – Individual feels they are spinning or the world is spinning.
- Dizziness – May include light-headedness or wooziness, feeling faint, not feeling steady, feeling like you are going to fall

Symptoms of dizziness:

- Individual may complain of vertigo when they roll over, when they lie down, look up or bend over. They may or may not complain of dizziness when they return to the upright sitting position.
- Individual will report when they go into provoking position that they feel the world is spinning or they are spinning.

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Motion Sensitivity

An individual may complain of dizziness that is not related to one specific movement but is generalized to include a variety of movements. Individuals suffering from motion sensitivity may report a fear of moving. They may move very stiffly or slowly and avoid provoking positions.

Signs and symptoms of motion sensitivity:

- Dizziness with head movements
- Dizziness with walking and turning
- Dizziness with body movements

Treatment and Management Methods

Screening/evaluation in a rehabilitation setting is essential.

- Motions sensitivity test
- Balance testing
- Observations for and identification of type of nystagmus
- VOR testing
- Visual acuity
- Hall Pike-Dix test
- Treatment
- Visual motor exercises
- Canalith repositioning techniques
- Habituation and/or substitution exercises
- Walking with head movements
- Balance exercises with head movements
- Balance activities
- Education and problem solving

You can read more information about Balance difficulty after brain injury provided by Traumatic Brain Injury Model Systems at:

<http://www.msctc.org/tbi/factsheets/Balance-Problems-After-Traumatic-Brain-Injury>