

Randal W. Swenson, M.D.  
 David K. Palmer, M.D.  
 John E. Butler, M.D.  
 Justin D. Gull, M.D.



ENT SPECIALISTS  
[www.entslc.com](http://www.entslc.com)

Joshua G. Yorgason, M.D.  
 Wesley R. Brown, M.D.  
 Nancy J. Stevenson, PA-C  
 Kristin G. Hoopes, PA-C

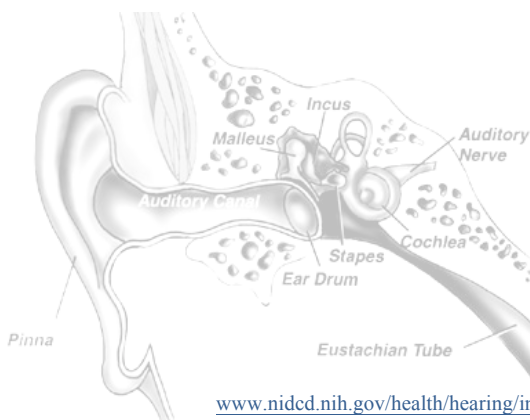
## Dizziness / Imbalance

**Dizziness** is a subjective sensation of unsteadiness, imbalance or disorientation to one's surroundings. It is not a disease, but rather a symptom of one of many different diseases, and varies from mild unsteadiness, to a severe spinning sensation known as **Vertigo**. Dizziness may or may not be accompanied by a hearing impairment, depending on the cause. Hearing is measured in decibels (dB), and a hearing level of 0-25 dB is considered normal hearing. Your level is:

Right ear \_\_\_\_\_ dB      Left ear \_\_\_\_\_ dB

### Hearing Severity / % Loss

25 dB (normal).....0%	65dB(Severe).....60%
35 dB (mild).....15%	75dB(Severe).....75%
45 dB (moderate)..30%	>85dB (Profound)..>90%



[www.nidcd.nih.gov/health/hearing/innear](http://www.nidcd.nih.gov/health/hearing/innear)

**The normal ear** is divided into the outer, middle and inner ear. The outer ear helps carry sound to the ear drum, or tympanic membrane. In the middle ear, sound is transmitted from the ear drum to the three hearing bones, or ossicles, and then to the inner ear. In the inner ear, sound is converted into a fluid wave, and interpreted by the **hearing organ**, the cochlea, as different sound frequencies. The hearing nerve carries this sound information to the brain. The inner ear also contains five **balance organs**, including three fluid-filled semicircular canals which detect head rotation, and

two other crystal-containing organs that detect vertical and horizontal movements.

**The human balance (vestibular) system** is organized into three peripheral sensory inputs: the eyes, the inner ear, and body (sensation from the feed as well as feedback from the muscles). These separate systems send information to the brain, which acts as a central computer for processing and interpreting it as balance. Any time you have problems with the eyes (example: cataracts), the inner ear (example: ear infection), the body (example: loss of feet sensation from diabetic neuropathy), or the brain (example: multiple sclerosis) it can disrupt this process and lead to the sensation of dizziness. Inner ear diseases usually cause room-spinning **vertigo**, whereas central disease or problems with the eyes or the body lead to a more vague type of dizziness or imbalance.

### Inner Ear Causes of Dizziness

**Labyrinthitis**, or vestibular neuritis, is the most common cause of inner ear dizziness. This usually presents as severe room-spinning vertigo that comes on suddenly, and then gets better over several days. This is thought to be caused by a viral upper respiratory viral infection (a cold), or from a bacterial ear infection. Acute labyrinthitis can also cause a sudden hearing loss, which needs immediate testing and treatment. It usually gets better on its own, but can sometimes lead to a permanent loss of hearing or balance. These losses can be diagnosed with hearing and balance testing, and treated with hearing aids or balance therapy, respectively.

**Benign positional vertigo** is the second most common cause of inner ear dizziness. This presents as a spinning vertigo that lasts for several seconds and that is brought on by sudden head movements or by lying down with the head turned to one side. This is caused by calcium carbonate crystals from one balance organ that come loose and get trapped

in a balance canal, leading to an exaggerated vestibular response with head movement. This can be diagnosed and treated with specific maneuvers that reposition the loose crystals. Severe cases can be treated with surgery to block the crystals from re-entering the balance canal.

**Meniere disease** is another common inner ear cause of dizziness. It presents as spinning or vague dizziness that last for minutes to hours, and is typically accompanied by tinnitus (head noise) and a sensation of pressure or fullness in the ear. It can also cause intermittent hear loss, but also lead to sudden irreversible hearing loss, or worsening of hearing over years. It usually is in one ear, but can over many years progress to both ears. It may be caused by many factors, such as viral, allergy, autoimmune, which are theorized to disrupt the flow of fluid in the inner ear, leading to a build-up of fluid in the inner ear that affects hearing and balance. It can be treated with lowering dietary salt intake, but taking diuretics (water pills) or other medications that alter the fluid production in the ear. It can be treated with a pressure device attached to ear bud inserts that require surgical placement of ear ventilation tubes. It can be treated occasionally with in-office steroid or gentamicin ear injections. It can also be treated surgically with an endolymphatic mastoid shunt procedure, a labyrinthectomy or a vestibular nerve section.

**Autoimmune ear disease** is another cause of dizziness and hearing loss, that is typically seen in patients with other autoimmune diseases, or in patients with no other identifiable cause as this is a diagnosis of exclusion. It can lead to symptoms similar to Meniere disease, but typically eventually involves both ears. It can improve with corticosteroids, which can be administered orally or injected into the ear drum. Long-term treatment is with medication that targets the immune system, and is managed by a rheumatologist.

**Perilymphatic fistula** is when there is a leak in the inner ear bone leading to dizziness with pressure changes or exertion. This is usually seen in patients with chronic ear infections or who have had ear surgery. **Superior canal dehiscence** is a condition where there is unexplained thinning of the skull bone directly over one of the balance canals. This can lead to dizziness with exertion, as intra-abdominal pressure is transferred to the brain and then to the inner ear. It can also cause hearing loss.

It is diagnosed with a CT scan and certain balance tests, and can be treated surgically in cases of debilitating dizziness.

### Central Causes of Dizziness

Migraine is a common disorder, affecting 10% of men and 30% of women. **Atypical migraine** causes a vague type of dizziness in 25% of patients with migraine headaches, and can also occur in patients who do not have migraine headaches. It may be a more common cause of dizziness than any inner ear problem. It is more common in patients who have a family history of migraines. Migraines are believed to occur because of altered blood flow to the brain or brainstem leading to abnormal neuron electrical activity. This is why patients get altered sensations such as visual lights and face burning/pain or numbness. Migraines can be treated with medications to prevent as well as abort attacks, and patients should learn what triggers their migraines and avoid these triggers. Severe cases may require a neurologist. Patients with atypical migraines and dizziness are encouraged to learn about classic migraines to better understand and treat their condition.

An **acoustic tumor** is a benign (not cancer) slow-growing mass that occasionally occurs on the balance nerve. It typically presents with hearing loss in one side and tinnitus (head noise or ringing), but can also cause dizziness. Any patient with an unexplained hearing loss in only one ear and dizziness should get an MRI to rule out this tumor. It can be followed with serial MRIs and can also be treated with a form of radiation. Most commonly, an acoustic tumor is treated with surgery to prevent complications caused by ongoing tumor growth. An operation has been developed to remove small tumors and still preserve hearing. Large tumors usually have to be removed through the ear bone, and hearing is not spared.

Other central causes of dizziness include a brainstem stroke and **transient ischemic attacks** (TIAs or ministrokes), or temporary stroke symptoms, and other brain conditions like **Multiple Sclerosis**.

For more information visit:

<http://www.entnet.org/healthinformation/ears.cfm>

<http://emedicine.medscape.com/article/1159385-overview>