

Vertigo is the feeling of spinning or falling through space when there is no motion. Sensations associated with vertigo include a sense of spinning, tumbling, falling forward or backward, or of the ground rolling beneath one's feet. It may be difficult to focus visually; many people find it uncomfortable to keep their eyes open during vertigo spells. Sweating, nausea, and vomiting are also common. Vertigo can last only a few minutes, or it can last days, depending on the cause.

Vertigo is not a disease but is a symptom of a broad range of disorders, diseases, and conditions, including:

- Diseases or disorders of the inner ear (such as motion sickness; the formation of “sludge” in the inner ear, which causes the inner ear to send a confusing motion signal to the brain; or tumors in the inner ear)
- Injuries or other damage to the inner ear (for example, from drugs such as aspirin and some diuretics, chemotherapy drugs, and antibiotics)
- Diseases or disorders of the brain (such as tumors, migraine, transient ischemic attack or stroke, or a psychiatric disease or disorder)
- Disorders affecting the acoustic nerve, which connects the inner ear to the brain
- Ménière's disease or Ménière's syndrome
- Viral and bacterial infections
- Allergies
- Multiple sclerosis
- Damage to the nerves in the neck that help the brain monitor the relative position of the neck and trunk (this form of vertigo, called cervical vertigo, often occurs after an injury such as a whiplash injury but may be associated with arthritis in the neck or degenerative cervical spine disease)
- Low blood pressure

Under normal circumstances, the brain relies on three sensory systems to maintain spatial orientation: the vestibular system (the inner ear), the visual system (the eyes), and the somatosensory system (which conveys information from the skin, joint, and muscle receptors). These three systems overlap, allowing the brain to assemble an accurate sense of spatial orientation. However, a compromised system or conflicting signals can cause vertigo.

The vestibular system is most often involved with vertigo. The sensory organs for the vestibular system are located in the bony labyrinths of the inner ear. They include three semicircular canals and an otolithic apparatus on each side. The otolithic apparatus consists of tiny particles of calcium carbonate suspended in a gelatinous matrix in two structures called the utricle and the saccule. These particles shift in response to movement in a straight line, stimulating cilia (hair-like fibers) that are embedded in the gel. Movement at an angle is detected by the semicircular canals. These components work together to provide a sense of spatial orientation.

Broadly classified, vertigo is usually either physiologic or pathologic. Physiologic vertigo is normal and occurs when there is a conflict between the signals sent to the brain by the vestibular system and by the other balance-sensing systems of the body. It can also occur when the head is subjected to unfamiliar movements, such as the rolling motion associated with seasickness, spinning for an extended period, or when the head is held in an unusual position (such as when you tilt your head and neck back for an extended period). Physiologic vertigo is usually easily corrected, either by moving the head and neck into a more normal position or by focusing on an external reference point to give the vestibular system an opportunity to stabilize. This is why a person with motion sickness is advised to look into the distance and focus on some faraway point, such as the horizon.

Pathologic vertigo occurs because of lesions or disorders in any of the three sensory systems (usually the vestibular system). Pathologic vertigo is further broken down into:

- **Labyrinthine dysfunction**—Labyrinthine dysfunction can occur as a result of any disease or condition that affects the ability of the vestibular organs (the labyrinths) to communicate with the brain.
- **Vertigo of the vestibular nerve**—Diseases of the eighth (vestibular) cranial nerve cause vertigo of the vestibular nerve.
- **Central vertigo**—Lesions on the brainstem or cerebellum (parts of the nervous system in which information from the vestibular system is integrated with information from the eyes and from the musculoskeletal position sensors, or proprioceptors) can cause central vertigo.
- **Psychogenic vertigo**—Psychogenic vertigo usually occurs with panic attacks or agoraphobia (fear of open spaces).

No matter what the cause, vertigo is common, affecting millions of people annually. Episodes of vertigo increase with age, accounting for more than 61 percent of all cases of dizziness by age 65 (Oghalai JS et al 2000). The overall incidence of dizziness,

vertigo, and imbalance is 5 percent to 10 percent of the overall population and 40 percent in patients older than 40.

BENIGN PAROXYSMAL POSITIONAL VERTIGO

Benign paroxysmal positional vertigo (BPPV) occurs after a sudden movement of the head. It is one of the most common types of vertigo (Crespi V 2004). Women are affected twice as often as men, and the average age of onset is the middle 50s (Salvenelli F et al 2004).

BPPV is usually harmless and often no cause is ever detected (that is, it is idiopathic). In some cases, however, BPPV is caused by age-related degeneration or head trauma (Gordon CR et al 2002). Patients with BPPV have short-lived episodes of temporary dizziness, lightheadedness, imbalance, and nausea. The symptoms of BPPV usually develop suddenly after a change in head position and may be severe enough to cause vomiting (Goplen F et al 2002). Typical motions that cause episodes of BPPV include getting out of bed, rolling over, bending down, and looking up while standing (Bertholon P et al 2002). One of the characteristic symptoms of BPPV is the rapid movement of the eye in one direction followed by a slow drift back to its original position. This involuntary movement of the eyes is a type of nystagmus. Doctors can sometimes tell what kind of vertigo is present by the nature of the nystagmus.

BPPV occurs when debris from the otoliths settles into the posterior semicircular canal. This renders the canal oversensitive to the pull of gravity, producing a constant sense of motion or of falling (Parnes LS et al 2003).

MÉNIÈRE'S SYNDROME AND MÉNIÈRE'S DISEASE

The terms Ménière's disease and Ménière's syndrome are sometimes used interchangeably, but they are not the same disorder even though both involve the inner ear apparatus. Ménière's disease develops due to idiopathic (or unknown) causes, while Ménière's syndrome is secondary to other diseases such as inner ear inflammation caused by syphilis, thyroid disease, or head trauma. Of the two, the most common is idiopathic Ménière's disease.

Ménière's of either variety is recognized by a classic triad of symptoms: vertigo; low-frequency, fluctuating hearing loss; and tinnitus (ringing in the ears) (da Costa SS et al 2002). Also, the condition is characterized by a condition known as endolymphatic hydrops, or increased hydraulic pressure in the inner ear's endolymphatic system. Although researchers have long suspected that endolymphatic hydrops was the underlying cause of the symptoms of Ménière's disease, newer studies have called into question an even deeper cause. According to the most recent research, the endolymphatic hydrops in Ménière's disease may be caused by neurotoxicity and progressive nerve damage in the cochlear nerve in the ear, and the increased pressure is a result, rather than a cause (Megerian CA 2005; Semaan MT et al 2005). Some early research has suggested that the nerve cell toxicity is mediated by nitric oxide, which is an important mediator in the inflammatory process. This suggests that agents that block nitric oxide may someday be important in the treatment of Ménière's (Megerian CA 2005; Takumida M et al 2001).

In the meantime, while researchers are still pursuing these findings, other treatments may come to the forefront. For instance, because people with Ménière's disease have been shown to have characteristic abnormalities in their inner ear, and an elevated level of free radicals (Raponi G et al 2003), free radical scavengers may be of benefit in treating Ménière's.

People who have Ménière's may experience attacks of vertigo that last 1 to 8 hours. These attacks (and the accompanying tinnitus) can be severe. There may also be an aura (such as a sensation of seeing lights or smelling odors). These symptoms may last an indefinite period. In the worst cases, hearing loss is permanent (de Sousa LC et al 2002).

OTHER TYPES OF VERTIGO

Other types of vertigo include:

- **Vestibular neuronitis** involves an attack of vertigo that occurs without accompanying disruption of hearing. Its symptoms may persist for up to several weeks before clearing, but usually abate within a matter of days. It is sometimes referred to as vestibular neuropathy (El-Kashlan HK et al 2000).
- **Labyrinthitis** is an acute inflammation of the labyrinths, often caused by viral infections, although it can also be caused by reactions to medications or toxins. People with labyrinthitis experience an acute onset of severe vertigo that lasts several days to a week. It is typically accompanied by hearing loss and ringing in the ears.
- **Phobic postural vertigo** is the second most common diagnosis in people who have dizziness or vertigo, although there is some debate about whether this is a single disorder or represents a group of different conditions with possibly different causes (Eckhardt-Henn A et al 1997). Phobic postural vertigo is characterized by nonrotational vertigo with postural and gait instability, and mainly occurs in people who have an obsessive-compulsive personality (Dieterich M 2000).
- **Migraine-associated vertigo** is a disorder that can accompany a migraine headache. In medical practices focused on treating migraine, 27 percent to 42 percent of patients report episodic vertigo. A large number (about 36 percent) of these

patients also experienced vertigo during headache-free periods (Bir LS et al 2003).

- **Posttraumatic vertigo** immediately follows head trauma, in most cases causing damage to the inner ear mechanisms in the absence of other central nervous system signs. The interval between injury and onset of symptoms can be days or even weeks. The mechanism for the delay of symptoms is uncertain but includes hemorrhage into the labyrinth, with later development of labyrinthitis in the fluids of the inner ear (Ernst A et al 2005).
- **Central nervous system dysfunction** causes of vertigo are varied and include brainstem vascular disease, arteriovenous malformation, tumor of the brainstem and cerebellum, multiple sclerosis, and vertebrobasilar migraine (Baloh RW 2002).

CONVENTIONAL TREATMENT OF VERTIGO

Although BPPV and some other common causes of vertigo are relatively harmless and disappear over time, there are other forms whose appearance might signify the beginning of a more serious condition. Because of this, it is always recommended that any case of vertigo be evaluated by an experienced physician.

The conventional treatment of vertigo depends on its underlying cause. In the case of BPPV, the most common therapy is repositioning exercises that redistribute the calcium carbonate back throughout the inner ear. There are various forms of repositioning exercises, including the Epley maneuver. In the Epley maneuver, the person lies down and the head is moved from side to side, with each position being held about 20 seconds. This has been shown to redistribute the calcium deposits in the inner ear, thus reestablishing normal function (Epley JM 1994). Nonsurgical, nonpharmaceutical exercises such as the Epley maneuver have an excellent record of reversing vertigo caused by BPPV.

Treatment of Ménière's is aimed at controlling the vertigo, usually through salt restriction or diuretics to relieve the elevated pressure in the endolymphatic sac. Similarly, glucocorticoids may be prescribed. For severe cases, surgery is sometimes recommended to decompress the endolymphatic sac. Unfortunately, no effective therapy for the tinnitus or hearing loss has been identified.

Other pharmaceuticals used to suppress vestibular abnormalities include anticholinergics, benzodiazepines, and antihistamines. Some patients who have nausea use antiemetics.

NUTRITIONAL APPROACHES TO VERTIGO

As a symptom, the presence of vertigo is always a reason to see a physician. At the same time, however, for conditions in which vertigo persists (such as Ménière's disease), a number of nutrients might be considered to counteract the effects, including:

- **Antioxidants**—Antioxidants mitigate the damaging effects of free radicals on tissues, cell membranes, and DNA. Vitamin C, vitamin E, lipoic acid, and glutathione are among the most important antioxidants. Vitamin C has been shown to have a beneficial effect on patients with Ménière's disease when given in combination with glutathione (Takumida M et al 2003). Glutathione itself, a powerful antioxidant, has been demonstrated to be effective in treating vertigo induced by Ménière's disease (Raponi G et al 2003). Because glutathione is poorly absorbed by the body, the Life Extension Foundation recommends taking precursors to glutathione, including N-acetylcysteine and lipoic acid. It is worth noting, however, that the role of L-glutamate has been studied in vertigo with somewhat conflicting results. There is some evidence that the neurotoxicity associated with some forms of vertigo is mediated by glutamate (Takumida M et al 2001). Glutamate-blocking drugs have also been proposed as treatment for vertigo (Shulman A 1997).
- **Vitamin B6**—Studies have reported positive effects using vitamin B6 on drug-induced vertigo and nausea, suggesting that vitamin B6 appears to offer protection against this form of vertigo (Claussen CF et al 1988).
- **Ginkgo biloba**—Researchers in Poland have recently found that vertigo induced by vestibular receptor impairment can be reduced by Ginkgo biloba extract. According to their study, almost all of the 45 patients who received 120 mg twice daily of Ginkgo biloba extract for 30 days showed a significantly increased ability to compensate for vestibular lesions and subsequently experienced fewer episodes of vertigo (Orendorz-Fraczkowska K et al 2002). These results confirmed the earlier work performed by researchers at the University of Sassari (Italy), who found that patients who received Ginkgo biloba extract at 80 mg twice daily had their vertigo and dizziness reduced by as much as 65 percent (Cesarani A et al 1998). Positive results have also been found in trials of people who have vertigo of various causes (Claussen CF 1986; Haguenaer JP et al 1986; Issing W et al 2005).
- **Coenzyme Q10 (CoQ10)**—During a multicenter clinical trial of 2664 patients with congestive heart failure, 73 percent reported a decrease in the incidence of vertigo after only 3 months of treatment with 50 to 150 mg of CoQ10 daily (Baggio E et al 1994).
- **Ginger**—Volunteers who took ginger and were then subjected to induced motion sickness (which includes vertigo as a symptom) experienced delayed onset of motion sickness and reported a shorter recovery time (Lien HC et al 2003). These results have been confirmed by other studies that showed that ginger reduced motion sickness and its associated vertigo (Grontved A et al 1986; Grontved A et al 1988). One researcher hypothesized that the positive effects of ginger were likely the result of its effect on the gastric system (Holtmann S et al 1989).

If you have vertigo, it is important to see a physician, who will try to uncover any underlying conditions that may be causing the vertigo. In some kinds of vertigo (for example, BPPV), patients may be taught the Epley maneuver and other positional exercises that have been shown to help relieve vertigo.

In other forms of vertigo, particularly Ménière's disease, the following supplements may help improve symptoms:

- **Vitamin C**—1000 to 6000 mg daily with food with 500 to 1000 mg of N-acetylcysteine daily
- **Vitamin B6**—150 mg with food, while vertigo persists
- **Ginkgo biloba**—120 mg daily
- **CoQ10**—50 to 200 mg daily with food
- **Ginger**—As directed on label (especially for motion sickness).

VERTIGO SAFETY CAVEATS

An aggressive program of dietary supplementation should not be launched without the supervision of a qualified physician. Several of the nutrients suggested in this protocol may have adverse effects. These include:

Coenzyme Q10

- See your doctor and monitor your blood glucose level frequently if you take CoQ10 and have diabetes. Several clinical reports suggest that taking CoQ10 may improve glycemic control and the function of beta cells in people who have type 2 diabetes.
- Statin drugs (such as lovastatin, simvastatin, and pravastatin) are known to decrease CoQ10 levels.

Ginger

- Do not take ginger if you have a bile duct obstruction or gallstones. Ginger may stimulate bile production.
- High doses of ginger (6 grams or more) can cause damage to the stomach lining and ulcers.
- Ginger can cause allergic skin reactions.
- Consult your doctor before taking ginger if you take blood thinners such as warfarin (Coumadin). Ginger can increase the risk of bleeding.

Ginkgo biloba

- Individuals with a known risk factor for intracranial hemorrhage, systematic arterial hypertension, diabetes, or seizures should avoid ginkgo.
- Do not use prior to or after surgery.
- Avoid concomitant use of ginkgo with NSAIDS, blood thinners, diuretics, or SSRI's.
- Gastrointestinal symptoms (nausea and diarrhea) may occur.
- Allergic skin reactions may occur.
- Elevations in blood pressure may occur.

Vitamin B6

- Individuals who are being treated with levodopa without taking carbidopa at the same time should avoid doses of 5 milligrams or greater daily of vitamin B6.

Vitamin C

- Do not take vitamin C if you have a history of kidney stones or of kidney insufficiency (defined as having a serum creatine level greater than 2 milligrams per deciliter and/or a creatinine clearance less than 30 milliliters per minute).
- Consult your doctor before taking large amounts of vitamin C if you have hemochromatosis, thalassemia, sideroblastic anemia, sickle cell anemia, or erythrocyte glucose-6-phosphate dehydrogenase (G6PD) deficiency. You can experience iron overload if you have one of these conditions and use large amounts of vitamin C.

For more information see the Safety Appendix

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