

Vertigo

What is vertigo?

Dizziness is a general, non-specific term to indicate a sense of disorientation. Vertigo is a type of dizziness and refers to a false sensation that oneself or the surroundings are moving or spinning (usually accompanied by nausea and loss of balance) that is a result of a mismatch between vestibular, visual and somatosensory systems.^[1]

Causes of vertigo are often differentiated into:

- Central (cerebral cortex, cerebellum, brain stem) - eg, cerebrovascular disease, migraine, multiple sclerosis, acoustic neuroma, diplopia, alcohol intoxication.
- Peripheral (vestibular labyrinth, semicircular canals or vestibular nerve) - eg, viral labyrinthitis, vestibular neuritis, benign paroxysmal positional vertigo (BPPV), Ménière's disease, motion sickness, ototoxicity (eg, gentamicin), herpes zoster (Ramsay Hunt syndrome).

Vertigo has often inappropriately become synonymous with labyrinthitis, which is then used to mean acute and chronic dizziness that is presumed to be benign in origin. However, vertigo, is the illusion of movement, whereas labyrinthitis refers to inflammation of the labyrinth (vestibular and cochlear) and is very rare in practice. Vestibular neuritis (inflammation of the vestibular nerve with sparing of the cochlear nerve, which is more common than labyrinthitis) is also often inappropriately referred to as vestibular labyrinthitis.^[2]

Vertigo causes^[3]

- [Vestibular neuritis and labyrinthitis.](#)
- [Benign paroxysmal positional vertigo \(BPPV\).](#)
- [Vertebrobasilar ischaemia.](#)

- Eustachian tube dysfunction (causes mild vertigo).
- [Ménière's disease](#).
- [Chronic otitis media](#).
- Drugs: salicylates, quinine, aminoglycosides.
- [Vestibular migraine](#).
- [Epilepsy](#): the likely diagnosis if vertigo is associated with loss of consciousness.
- [Acoustic neuroma](#): may cause mild vertigo but associated with unilateral sensorineural deafness and tinnitus.
- [Nasopharyngeal carcinoma](#).
- Neurological: brain stem [cerebrovascular accident](#), [multiple sclerosis](#), [syringobulbia](#), [cerebellar tumours](#).
- Following [head injury](#).

Vertigo epidemiology

- Most balance problems that present in primary care are not true rotatory vertigo. One review showed that, of people presenting with symptoms of dizziness in the community, around a third were found to have vertigo, this proportion increasing with age.
- A community study of more than 2000 randomly sampled adults, found that 7% had reported true vertigo in the previous year. The lifetime prevalence of vertigo has been estimated to be 3-10%.
- The prevalence of vertigo and dizziness in people aged more than 60 years reaches 30%.^[4]
- The most common causes of vertigo symptoms in primary care are benign paroxysmal positional vertigo, Meniere's disease, and vestibular neuronitis.^[5]

Vertigo symptoms^[5] ^[6]

In the elderly, common causes of vertigo may present differently with less rotatory vertigo and more nonspecific dizziness and instability than in younger patients, making diagnosis more difficult.^[4]

Complaints of dizzy spells are very common and are used by patients to describe many different sensations. The key to making a diagnosis is to find out exactly what the patient means by dizzy and then decide whether or not this represents vertigo. With a clear description of vertigo, the precipitants and time course (onset, frequency and duration of attacks) are often diagnostic.

Assess the nature of the dizziness

- Assess whether the person has vertigo rather than presyncope, disequilibrium (imbalance), or light-headedness. Vertigo usually causes rotatory or spinning symptoms. See also the separate [Dizziness, Giddiness and Feeling Faint](#) article.

Assess any associated symptoms

- Ear symptoms - eg, hearing loss, ear discharge, tinnitus.
- Neurological symptoms - eg, headache, diplopia, visual disturbance, dysarthria or dysphagia, paraesthesia, muscle weakness or ataxia.
- Autonomic symptoms - eg, nausea and vomiting, sweating or palpitations.
- Symptoms suggesting migraine aura - eg, visual or olfactory symptoms.

Assess any relevant medical history

- Recent upper respiratory tract infection or ear infection (may suggest a diagnosis of vestibular neuronitis or labyrinthitis).
- History of migraine.
- Head trauma or recent labyrinthitis suggests BPPV.
- Direct trauma to the ear, which may indicate possible perilymph fistula.
- Both anxiety or depression can aggravate dizziness or vertigo.
- Cardiovascular risk factors increase the likelihood that stroke may be the cause of vertigo.

- Some drugs (eg, aminoglycosides, furosemide, antidepressants, antipsychotics, anticonvulsants) may cause vertigo.
- Acute intoxication with alcohol may cause vertigo.

Examination

- Neurological examination, including gait and their ability to stand unaided, cranial nerves, cerebellar function, signs of peripheral neuropathy and any indication of a cerebrovascular event.
- Ear examination, including signs of infection, discharge and cholesteatoma.
- Eye examination: nystagmus (common in acute vertigo), fundoscopy.

Specific clinical tests

Romberg's test

This is used to identify instability of either peripheral or central cause:

- The patient stands up straight with feet together (or at a distance for them to be steady) with arms outstretched. Then ask them to shut their eyes.
- If they are unable to maintain their balance with their eyes closed, the test is positive (usually fall to the side of the lesion so stay close by to prevent them falling).
- A positive test suggests a problem with proprioception or vestibular function. Romberg's test can also be positive in neuromuscular disorders and may not be reliable in very elderly people.

Dix-Hallpike manoeuvre

Can be used to confirm BPPV.

Head impulse test

This is used to help determine whether the cause of vertigo is peripheral or central (although it is not a sensitive test):

- Be very cautious if the patient has neck pathology, as it involves rapid repositioning of the head. Ask the patient to rotate their neck to assess for any limitation of neck movement. If in doubt about the safety of the manoeuvre, seek specialist advice or refer the person to a balance specialist.
- The patient should sit upright and fix their gaze on the examiner.
- Rapidly turn their head 20° to one side and watch the eyes for corrective abnormal movements.
- Repeat several times to the same or opposite side (at random) until satisfied as to the consistent presence or absence of the corrective abnormal movements.
- Corrective abnormal movements represent a positive test and imply moderate to severe loss of function of the horizontal semicircular canal on the side to which the test is positive.

Unterberger's test

This is used to identify damage to one of the labyrinths:

- The patient should march on the spot for 30 seconds with their eyes closed; observe them for lateral rotation:
 - If there is no rotation, there is symmetrical labyrinthine function.
 - If there is labyrinthine damage, the person will rotate to the side of the affected labyrinth.

To determine the cause of vertigo

- Determine whether the vertigo is central or peripheral. Features increasing suspicion of a central cause of vertigo include:
 - Persistent, severe, or prolonged vertigo (although this may also indicate severe Ménière's disease, or severe vestibular neuronitis).
 - New-onset headache.
 - Focal neurological symptoms and signs - eg, cranial nerve palsies, dysarthria, ataxia, or other cerebellar signs, papilloedema.
 - Central-type nystagmus - eg, vertical nystagmus.
 - Abnormal response to the Dix-Hallpike manoeuvre (eg, vertical nystagmus without latency, adaptation, or fatiguability; excessive nausea and vomiting).
 - Prolonged, severe imbalance with inability to stand up even with the eyes open.
- In central vertigo:
 - Nausea and vomiting are usually less severe than with peripheral causes.^[3]
 - Hearing is usually normal, except in acute brainstem stroke, when a unilateral hearing loss can occur. Hearing may be symmetrically reduced if a coincidental hearing loss is present.
 - There is no sensation of pressure in the ear as may be present in Ménière's disease.
 - The head impulse test is negative.

- If peripheral vertigo is suspected, use the history and examination findings to differentiate between conditions:
 - In BPPV, episodes of vertigo are induced by moving the position of the head and episodes last for seconds (but may be described as minutes).
 - In vestibular neuronitis and labyrinthitis, vertigo usually persists for several days and gradually improves with time.
 - In vestibular neuronitis there is no hearing loss or tinnitus.
 - People with labyrinthitis report sudden hearing loss associated with vertigo, and tinnitus may be present, but they do not usually have the feeling of fullness in the ear that is described by people with Ménière's disease.
 - In Ménière's disease, episodes of vertigo occur spontaneously, are not provoked by positional change, and last much longer (30 minutes to several hours) than in BPPV. Tinnitus, hearing loss and fullness in the ear are present in Ménière's disease but not usually in BPPV or vestibular neuronitis.

Differential diagnosis^[7]

See also the separate [Dizziness, Giddiness and Feeling Faint](#) article.

- Dizziness associated with [postural hypotension](#).
- Disequilibrium, which occurs when the brain receives inadequate information about the body's position from the somatosensory, visual and vestibular systems, may result from peripheral neuropathy, eye disease, or peripheral vestibular disorders.
- Presyncope is caused by reduced cerebral perfusion caused by cardiovascular disorders or anaemia.
- Light-headedness is nonspecific and hard to diagnose; it may result from panic attacks with hyperventilation.

Investigations

- No investigations are likely to be performed in primary care.

- Secondary care investigations include:
 - Audiometry for cochlear function.
 - Vestibular function: electronystagmography, calorimetry and brain stem-evoked responses.
 - Possible neurological cause: CT or MRI.
 - Electroencephalography (EEG): epilepsy.
 - Lumbar puncture: possible multiple sclerosis.
 - Syphilis serology.

Vertigo treatment and management^[8] ^[9] ^[10]

For specific treatment of the various conditions, see individual articles. Explanation and reassurance are important as anxiety exacerbates vertigo. Persistent disequilibrium should be overcome by central adaptation but anxiety may prevent this.

Referral^[5]

- Severe nausea and vomiting and inability to tolerate oral fluids or symptomatic drug treatment (admit to hospital).
- Very sudden onset of vertigo (within seconds) that is not provoked by positional change and is persistent (admit or urgently refer to a neurologist or balance specialist (eg, ENT, audiovestibular specialist, or care of the elderly physician with a special interest)).
- Central neurological symptoms or signs - eg, a new type of headache (especially occipital), gait disturbance, truncal ataxia (admit or urgently refer the person to a neurologist).
- Acute deafness without other typical features of Ménière's disease (admit or urgently refer the person to an ENT specialist or audiovestibular physician).
- For all other people with vertigo of undetermined cause: refer to a balance specialist (ENT, audiovestibular physician, neurologist, or care of the elderly physician with a special interest). The urgency of referral depends on the clinical presentation.

General advice^[5]

- Advise the person not to drive when they are dizzy, or if they are likely to experience an episode of vertigo while driving. The DVLA states that people liable to sudden attacks of unprovoked or unprecipitated disabling giddiness should stop driving.
- The person should inform their employer if their vertigo poses a risk in the workplace – eg, using ladders, operating heavy machinery or driving.
- Discuss the risk of falling in the home during an episode of vertigo and suggest measures to reduce this.

Drug treatment^[5] ^[11]

Consider offering symptomatic drug treatment with prochlorperazine, betahistine, cinnarizine, cyclizine or promethazine (antihistamines) for no longer than one week. It is important that the person should stop symptomatic treatment 48 hours before seeing a specialist. See the British National Formulary for prescribing information.^[12]

Rehabilitation programmes^[13]

- There is evidence to support the efficacy of vestibular rehabilitation programmes for unilateral peripheral vestibular disorder; a simple programme including patient education and home-based exercises can be sufficient.^[14]
- Booklet-based vestibular rehabilitation for chronic dizziness has been shown to be a simple and cost-effective means of improving patient reported outcomes in primary care.^[15]
- Balance rehabilitation is important and beneficial in elderly people, in whom dizziness is invariably multifactorial.
- A Cochrane review confirmed the efficacy of Epley's manoeuvre and then a period of post-Epley postural restriction (eg, upright head posture for 48 hours) in treating BPPV.^[16]
- The Cawthorne–Cooksey and other vestibular rehabilitation exercises promote central compensation and help resolve persistent disequilibrium. Disequilibrium due to Ménière's disease or BPPV may not respond. See under 'Further reading' below for a description of Cawthorne–Cooksey exercises.

A paper in the BMJ recommended that, for the management of people with chronic vertigo, specific treatment for the underlying vestibular disease should be provided first, but, patients who do not respond to disease-specific treatments should be offered vestibular rehabilitation instead of anti-vertigo drugs. Vestibular rehabilitation is a form of exercise therapy designed to optimise the process of vestibular compensation that is disrupted in patients with chronic vertigo.^[17] .

Surgery

Surgical options for Ménière's disease include endolymphatic sac surgery, vestibular nerve section, micropressure therapy and labyrinthectomy. See the separate [Ménière's Disease](#) article.

Complications^[5]

- Increased risk of falls, especially in the elderly.
- Vertigo may confine people to their homes, making them fearful or depressed.

Prognosis

The prognosis depends on the underlying cause.

Further reading

- [Cawthorne-Cooksey exercises](#); West Suffolk NHS Foundation Trust

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