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Common Causes of Vertigo and Vestibular Exercises That Can Help

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STORY AT-A-GLANCE

- Vertigo is characterized by a false sensation of movement or spinning while stationary. It can be categorized as either peripheral (caused by inner ear issues) or central (caused by central nervous system problems)
- Peripheral vertigo can result from conditions like benign paroxysmal positional vertigo (BPPV), Meniere's disease and vestibular neuritis. Central vertigo may be caused by migraines, strokes, multiple sclerosis or brain injuries
- Targeted treatments for BPPV include repositioning maneuvers such as the Epley, Foster, Semont and Gufoni maneuvers, which aim to relocate displaced inner ear crystals
- Vestibular rehabilitation therapy is a specialized form of physical therapy designed to retrain the brain in processing balance information
- Preventive measures to lower your risk of vertigo episodes include sleeping with your head raised, moving slowly when getting up, avoiding rapid head movements and exploring natural remedies like ginger tea or essential oils

Vertigo is a specific type of dizziness characterized by a false sensation of movement or spinning even when you're stationary. Approximately 40% of U.S. adults have experienced vertigo at least once in their lifetime, with women being more susceptible than men.[1]

Rather than a disease on its own, vertigo is a symptom that typically signals an underlying issue with your body's vestibular system or, in some cases, the central nervous system.[2] When left untreated, vertigo can significantly impact your quality of life, leading to persistent discomfort, stress and anxiety, and difficulty performing daily activities.

The good news is that effective strategies exist to address vertigo, often categorized as "exercises," though they go beyond the traditional notions of physical exercise. Rather, they are specialized techniques and maneuvers designed to recalibrate your body's balance system and improve your brain's ability to process spatial information. The specific techniques used for treatment can vary depending on the underlying cause of your vertigo.

Peripheral Vertigo — An Indicator of Vestibular Issues

Peripheral vertigo accounts for about 80% of all vertigo cases.[3] It's caused by a problem in the inner ear, where the vestibular system is found. Its key components include the semicircular canals, which are three loop-shaped tubes that detect rotational movements of the head, and the otolith organs (utricle and saccule), which detect linear accelerations and contain otoconia, tiny calcium-carbonate crystals that shift with head movement.[4]

Together, these components work to maintain balance and spatial orientation by continuously sending information about head movements and position to the brain via the vestibular nerve. Disruptions in these components can trigger peripheral vertigo. Common causes include:[5]

- **Benign paroxysmal positional vertigo (BPPV) —** The most frequent cause of peripheral vertigo, BPPV occurs when tiny calcium crystals in the inner ear become dislodged and move into the semicircular canals. This is often triggered by specific head positions and causes false signals to be sent to the brain.[6]

- **Meniere's disease —** Caused by abnormal fluid production within the inner ear, this condition causes pressure to build up, leading to vertigo. It may also impact your hearing.[7]
- **Labyrinthitis —** This condition is mainly defined by inflammation in the labyrinth of your inner ear, often due to a viral infection. It affects both your balance and hearing.[8]
- **Vestibular neuritis —** Characterized by an inflammation of the vestibular nerve, this condition disrupts the flow of sensory information from your inner ear to the brain.[9]
- **Acoustic neuroma —** This is caused by noncancerous tumor growths in the cranial nerve of your inner ear, which pushes against the adjacent structures, causing vertigo, hearing loss, headaches, tinnitus and even facial numbness.[10]

Central Vertigo — A Less Common Type of Vertigo

Your central nervous system (CNS), which comprises your brain and spinal cord, controls muscle movement and transmits sensory stimuli to your brain. With central vertigo, damage or dysfunction in the cerebellum, the brain's balance center, is often to blame.[11] Common underlying causes of central vertigo include:

- **Vestibular migraine —** This condition is characterized by episodes of vertigo that occur with or without headache. It's one of the most common causes of recurrent spontaneous vertigo episodes. Vestibular migraines can last hours to days and are often accompanied by sensitivity to light and sound, as well as visual disturbances.[12]
- **Stroke —** When a stroke affects areas of the brain involved in balance and spatial orientation, such as the brainstem or cerebellum, it can result in sudden, severe vertigo.[13]
- **Multiple sclerosis (MS) —** This chronic autoimmune disease affects the central nervous system, damaging the protective covering of nerve fibers (myelin).[14] When MS lesions occur in areas of the brain responsible for processing balance and

spatial information, it can cause vertigo that may come and go as part of relapsing-remitting symptoms.[15]

- **Traumatic brain injury or concussion —** Physical trauma to the head can disrupt normal brain function, including areas responsible for maintaining your balance.[16]
- **Brain and/or spinal cord tumors —** Tumors, whether benign or malignant, can cause vertigo if they develop in or put pressure on areas of the central nervous system involved in processing information from the vestibular system.[17]

Targeted Approaches for BPPV

To determine the appropriate treatment for your vertigo, it's crucial to get an accurate diagnosis to identify its underlying cause. As you might expect, treatment for peripheral vertigo differs from central vertigo because the problem originates in different parts of the body (ears versus CNS).

While most vertigo cases resolve on their own in a short time, persistent or chronic vertigo requires medical attention. For BPPV, physical therapy is often recommended. A physical therapist will perform specific head movements to reposition the crystal deposits in your inner ear to an area that doesn't affect your balance. These particle repositioning procedures include:

- **Epley maneuver —** The Epley maneuver, also known as the canalith repositioning procedure, is the most commonly used technique for treating BPPV affecting the posterior semicircular canal. It involves a series of head movements to reposition the displaced otoconia from the semicircular canals back to the utricle, where they no longer cause symptoms.[18]

  For mild, temporary cases, you can try to perform this technique at home if you know which of your ears is affected. Follow these steps to do the Epley maneuver:[19,20]

  1. Start by sitting on the edge of your bed.

2. Tilt your head 45 degrees to whichever side is causing vertigo.
3. Quickly lie flat on your back while still keeping your head turned. Your shoulders should now be resting on the pillow, and your head should be reclined. Wait for 30 seconds.
4. Without raising your head, turn it 90 degrees to the opposite side. Your head should now be looking 45 degrees in the opposite direction. Wait for another 30 seconds.
5. Turn your head and body another 90 degrees in the same direction, so you are lying on your side. Wait for another 30 seconds.
6. Carefully sit up.

- **Foster maneuver —** Also called the "half somersault" maneuver, the Foster maneuver was developed as a home treatment option for posterior canal BPPV. It involves a sequence of movements that mimic a somersault, but only halfway. Some people find this easier to perform, as it does not require lying on a bed. The video below demonstrates how to perform the Foster maneuver. Here's a summary:

    1. Kneeling on all fours, raise your head and look at the ceiling for a few seconds.
    2. Tuck your chin toward your knees, allowing the top of your head to rest on the floor. Wait for the vertigo to stop, typically about 30 seconds.
    3. Turn your head about 45 degrees toward the side causing the vertigo. Wait 30 seconds.
    4. Quickly raise up on all fours so that your head is level with your back (tabletop position), still at a 45-degree angle toward the affected side. Wait 30 seconds.
    5. Quickly sit upright, with your head angled at 45 degrees toward the affected side, then slowly stand up and straighten your head. If needed, repeat the sequence after resting for 15 minutes.

- **Semont maneuver —** This technique involves quickly moving from a sitting position to lying on one side, then to the opposite side in a single, swift movement to

dislodge and relocate the otoconia. Here's how it's performed:[21,22]

1. Sit upright with your head turned 45 degrees toward the unaffected ear.
2. Quickly lie down on the affected side, so you are looking up at the ceiling. Wait for about 30 seconds or until the dizziness has subsided.
3. With your head still turned to a 45-degree angle, rapidly rotate your body to the unaffected side, so that you're facing down. Wait for 30 seconds or until the dizziness has subsided.
4. Slowly return to a sitting position.

- **Brandt-Daroff exercises —** While not as immediately effective as the repositioning maneuvers, Brandt-Daroff exercises are often recommended as a supplementary or follow-up treatment for BPPV.[23] These exercises involve a series of repetitive movements performed several times a day. They aim to disperse otoconia through repeated position changes and may help prevent recurrence of BPPV symptoms. Follow these steps:[24]

    1. Sit on the bed with your feet on the floor. Turn your head 45 degrees to the right.
    2. While keeping your head turned, lie down on your left side. Remain in this position until any dizziness subsides, then continue to wait for an additional 30 seconds. If you feel no dizziness, hold the position for 30 seconds.
    3. Slowly return to the sitting position and wait for 30 seconds.
    4. Turn your head 45 degrees to the left. Then, repeat the process of lying on your right side, waiting for the dizziness to pass, and holding for 30 seconds if no dizziness is experienced.
    5. Return to the sitting position and wait for another 30 seconds.
    6. Perform a total of five repetitions on each side. Do this three times per day.

- **Gufoni maneuver —** This is primarily used to treat BPPV affecting the horizontal semicircular canal.[25] Here's how you can perform it, according to the University of

Michigan Health System:[26]

1. Begin by sitting on the edge of your bed. Sit with your head facing straight ahead and your chin level.
2. Quickly lie down on your right side. Wait for all your symptoms to go away plus an additional one minute.
3. Quickly turn your head so you are looking diagonally towards the floor (45 degrees downward). Stay in this position for two minutes.
4. Slowly return to a sitting position and keep your head level for 15 minutes.

Vestibular Rehabilitation Therapy (VRT) May Benefit Balance Disorders in General

Unlike the specific maneuvers used for BPPV, VRT is a specialized form of physical therapy designed to alleviate a wide range of balance disorders, including various types of vertigo.[27]

VRT works on the principle of neuroplasticity — the brain's ability to form new neural connections and adapt to changes. The therapy aims to compensate for the dysfunction in the vestibular system by retraining the brain to process balance information more effectively.[28,29] A study published in the Brazilian Journal of Otorhinolaryngology further explains:[30]

> *"VR is a physiological therapy method that acts on the vestibular system to stimulate CNS plasticity, supports the restoration of body balance, accelerates the mechanisms of compensation, adaptation and habituation. It has been suggested that VR increases the quality of life in individuals with dizziness and balance disorder.*
>
> *The leading VR principles are desensitizing the vestibular system, increasing vestibulo-ocular and vestibulo-spinal reflex gains and creating new alternative*

senses against imbalance triggered by position change. Improvement in all these mechanisms results in progressive improvement in dizziness and vertigo.

Components of vestibular rehabilitation include 'desensitizing' the vestibular system by provoking symptoms, learning to coordinate eye and head movements, developing balance and walking skills, and learning to handle disturbing situations.

VR components: 1) Compensation/habituation; 2) Adaptation (an adaptation of VOR [vestibulo-ocular reflex], gaze stabilization), 3) Sensory substitution (substitution of other strategies for lost function), 4) Motor learning to change movement behavior includes postural control exercises, fall prevention, relaxation exercises, reconditioning exercises and functional retraining."

Other Strategies to Reduce Your Risk of Vertigo

Aside from performing the vestibular exercises and maneuvers above, there are several preventive measures you can adopt to minimize your risk of experiencing vertigo episodes, including:[31]

Sleep with your head slightly raised.

Upon waking, move slowly when getting out of bed and sit on the edge of the bed for a minute or two before standing.

Avoid bending down to pick up items.

Avoid movements involving neck extension, such as reaching up to a high shelf.

Avoid rapid head movements during daily tasks.

Consider using natural remedies that may help against general dizziness, including Ginkgo biloba,[32] apple cider vinegar with honey,[33] ginger tea[34] and essential oils, such as peppermint,[35] ginger,[36] lavender and lemon[37] essential oils.

Keep your magnesium levels in check, as a deficiency in this mineral has been linked to a higher risk of vertigo.[38]

Stay hydrated by drinking pure, filtered water, as even mild dehydration can cause vertigo.[39]

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