CONDITION

Paroxysmal positional nystagmus

Paroxysmal positional nystagmus is a brief, involuntary eye movement brought on by changes in head position.

WHAT IT IS
Brief involuntary eye movements triggered by head-position changes

BODY SYSTEM
Balance system and nervous system

MAIN SYMPTOMS
Spinning dizziness, jerking eyes, nausea, imbalance

WHAT CAUSES IT
Usually loose inner-ear crystals; sometimes nervous system disorders

HOW IT IS DIAGNOSED
Positional tests with direct observation or video recording

MAIN TREATMENT
Repositioning manoeuvres or treatment of the underlying cause

CAN IT BE CURED?
Sometimes - inner-ear cases often respond to repositioning

IS IT AN EMERGENCY?
Sometimes - new stroke symptoms require emergency care

LONG-TERM OUTLOOK
Often improves, but recurrence is common

Overview

Paroxysmal positional nystagmus is a pattern of involuntary eye movement triggered by moving the head into certain positions. "Paroxysmal" means it happens in sudden episodes. "Positional" means it is brought on by position changes. "Nystagmus" means repetitive eye movement that you cannot control.

The eye movement may be horizontal, vertical, twisting, or a combination. It can happen when you lie back, roll over in bed, look upward, bend down, or sit up. The direction and duration of the movement help identify where the problem may be.

Paroxysmal positional nystagmus is a condition or clinical sign rather than one single disease. Its most common cause is benign paroxysmal positional vertigo, often shortened to BPPV. In BPPV, tiny calcium carbonate particles in the inner ear become displaced and interfere with

the balance sensors.

Less often, positional nystagmus is related to the brain pathways that control balance and eye movement. This is called central positional nystagmus. Identifying the pattern matters because inner-ear and central causes are assessed and managed differently.

Symptoms

You may not notice the eye movement itself. Instead, you may feel as though you or the room is spinning. This sensation is called vertigo. Someone looking at your eyes during an episode may see them jerk or drift.

Symptoms often begin after a particular head movement. In typical BPPV, they may start after a brief delay and settle within about a minute once the head is still. Some people remain mildly unsteady or "off" between episodes.

Possible symptoms include:

Position-related dizziness is not always caused by nystagmus or BPPV. Light-headedness when standing, for example, may come from a drop in blood pressure rather than the balance system.

Symptoms that continue without a break, are not clearly linked to position, or occur with new neurological problems need further assessment. "Neurological" symptoms are those involving the brain, spinal cord, or nerves, such as weakness, speech difficulty, or loss of coordination.

- Brief spinning brought on by turning or tilting the head
- Nausea, sometimes with vomiting
- Unsteadiness when standing or walking
- A sensation that the surroundings jump or move
- Anxiety about lying down, rolling over, or looking upward

Causes and risk factors

The inner ear contains fluid-filled balance organs. Some of these organs detect rotation, while others use tiny calcium carbonate particles to sense gravity and straight-line movement.

In BPPV, particles become loose and enter one of the fluid-filled semicircular canals. When your head moves, the particles shift and create a false signal of rotation. The mismatch between the two ears causes vertigo and a predictable pattern of nystagmus.

Often there is no clear reason why the particles became displaced. BPPV becomes more common with age. It may also occur after a head injury, a period of prolonged bed rest, or another inner-ear condition. Migraine is associated with positional vertigo in some people, although not every episode in someone with migraine is BPPV.

Central positional nystagmus can occur when a condition affects the cerebellum or brainstem. These parts of the brain coordinate balance and eye movements. Possible causes include stroke, multiple sclerosis, structural abnormalities, tumours, medication effects, and some inherited or degenerative neurological conditions. These causes are much less common than BPPV, but they are important to recognise.

The eye movement alone cannot tell you the cause without considering your symptoms, examination, and medical history.

Diagnosis

Diagnosis usually begins with questions about what brings on the symptoms, how long they last, and whether you have hearing or neurological symptoms. A clinician will examine your eyes, balance, walking, hearing, and nerve function as needed.

Positional tests deliberately move your head into positions that may bring on nystagmus. The Dix-Hallpike test is commonly used to assess the posterior semicircular canal, the canal most often involved in BPPV. A supine roll test can assess the horizontal canals.

During these tests, the clinician looks at:

Special goggles may be used to prevent visual fixation, which can suppress some forms of nystagmus. Video-oculography uses cameras to record eye movements for closer analysis.

Brain imaging is not routinely needed when the history and examination show a typical BPPV pattern without other concerning findings. MRI may be considered when the nystagmus is unusual, treatment does not produce the expected response, symptoms persist, or the examination suggests a central cause. Hearing tests may be arranged if you also have hearing loss, ringing in the ear, or ear pressure.

- Which position triggers the eye movement
- The direction in which the eyes move
- How quickly the movement begins
- How long it lasts
- Whether it becomes weaker when repeated

Treatment and management

Treatment depends on the cause and the affected part of the balance system.

For BPPV caused by loose inner-ear particles, the main treatment is a canalith repositioning manoeuvre. This is a planned sequence of head and body movements that guides the particles out of the affected semicircular canal. The Epley manoeuvre is commonly used for posterior-canal BPPV. Other manoeuvres are used for horizontal- or anterior-canal patterns.

Many people improve after one treatment, while others need the manoeuvre repeated. Temporary dizziness or nausea can occur during or shortly after it. The correct manoeuvre depends on which ear and canal are involved, so assessment is useful before attempting treatment at home.

Vestibular rehabilitation may help if you remain unsteady or sensitive to movement. This is a form of physical therapy that uses eye, head, balance, and walking exercises. It does not replace repositioning when loose particles are still causing BPPV, but it may support recovery.

Medicines for nausea or motion sensitivity may occasionally be used for short-term symptom relief. They do not move inner-ear particles back into place or cure BPPV. Some can cause sleepiness and may increase fall risk.

If the pattern suggests central positional nystagmus, management focuses on identifying and treating the underlying neurological condition. Repositioning manoeuvres generally do not correct a central cause. Surgery for persistent BPPV is rarely needed and is reserved for carefully selected cases.

Complications

The main immediate concern is falling during an unexpected episode. Activities involving ladders, heights, machinery, driving, or unsupported bathing may be unsafe while head movement is causing sudden vertigo.

Repeated nausea can affect eating and drinking. Severe vomiting may lead to dehydration. Some people also reduce normal activity because they fear triggering symptoms. Over time, this can contribute to stiffness, reduced confidence, or poorer balance.

BPPV can return after successful treatment, sometimes in the same ear and sometimes in another canal. Recurrence does not necessarily mean that treatment failed or that a dangerous condition is present, but a new episode should be reassessed if the pattern has changed.

With central positional nystagmus, complications depend mainly on the underlying condition

rather than the eye movement itself.

Prevention

Paroxysmal positional nystagmus often cannot be prevented. In many cases of BPPV, there is no identifiable event that caused the inner-ear particles to move.

Avoiding all head movement is not a reliable prevention strategy and may make stiffness, balance, and movement sensitivity worse. After a repositioning manoeuvre, strict sleeping-position or head-movement restrictions are not routinely needed for most people unless the clinician performing the treatment gives a specific reason.

Protecting your head during work, sports, and travel can reduce the risk of head injury, but it cannot prevent every case. There is no proven method that guarantees BPPV will not return.

Practical safety measures do not prevent the condition, but they can reduce harm during an active episode. These include using handrails, turning on lights before walking at night, and sitting down promptly if spinning begins.

Living with it and what to expect

When loose inner-ear particles are the cause, symptoms often improve after an appropriate repositioning manoeuvre. Some episodes also settle without treatment over days or weeks. Mild imbalance or motion sensitivity can remain after the brief spinning attacks stop.

BPPV can recur months or years later. If you have had a confirmed episode before, a clinician or vestibular therapist may teach you what recurrence can feel like and whether a home manoeuvre is suitable. A past diagnosis should not be used to assume that every later episode has the same cause.

Most people with successfully treated BPPV can return to their usual work, exercise, sleep positions, and daily activities. Return gradually if movement still causes symptoms. Avoid driving or hazardous tasks while you are having sudden vertigo or cannot move your head safely.

Central positional nystagmus has a less predictable course. It may improve when the underlying cause is treated, remain stable, or change over time. Follow-up may involve neurology, ear and balance specialists, or vestibular rehabilitation.

Arrange routine follow-up if symptoms keep returning, do not improve after treatment, or begin to follow a different pattern. Persistent imbalance may deserve assessment even after

the spinning has stopped.

When to get medical help

Arrange a routine medical appointment if you develop repeated brief spinning episodes when rolling over, lying back, looking up, or bending down. Assessment is also appropriate if symptoms interfere with walking, work, sleep, or driving.

Seek prompt medical advice if you have new hearing loss, severe ear symptoms, repeated vomiting, recent head injury, or dizziness that remains continuous rather than occurring only with position changes. Sudden hearing loss should be assessed urgently because early treatment may matter.

Call emergency services if dizziness or nystagmus occurs with possible stroke or another acute neurological problem, including:

Do not drive yourself for emergency assessment.

- New facial drooping, arm or leg weakness, or numbness
- New trouble speaking, understanding speech, or swallowing
- Sudden severe difficulty standing or walking
- New double vision, loss of vision, or marked loss of coordination
- A sudden severe headache unlike your usual headaches
- Collapse, loss of consciousness, or a seizure

Common questions

Is paroxysmal positional nystagmus the same as BPPV?

Not exactly. Paroxysmal positional nystagmus describes the eye movement. BPPV is the most common condition that causes this pattern, but neurological conditions can also produce positional nystagmus.

Can I see the nystagmus myself?

You may notice that your vision jumps or that the room appears to move, but many people cannot see their own eye movements. A clinician may observe them directly or record them with video goggles during positional testing.

How long does an episode last?

In typical BPPV, the strongest spinning and nystagmus usually last less than a minute after the triggering movement. Lingering nausea or imbalance may last longer. Continuous or unusually prolonged symptoms should be assessed rather than assumed to be BPPV.

Can I do the Epley manoeuvre at home?

A home manoeuvre may be appropriate after the affected ear and canal have been identified and you have been shown the correct technique. Using the wrong manoeuvre may not help and can sometimes move particles into another canal. Neck, back, blood vessel, or eye problems may also affect whether certain positions are safe.

Why does it keep coming back?

Inner-ear particles can become displaced again, and recurrence is common after BPPV. A return of familiar symptoms is usually treatable, but symptoms that are different, persistent, or accompanied by neurological changes need a fresh assessment.

Does positional nystagmus mean I have a brain tumour?

Usually not. BPPV is a much more common cause of brief position-triggered nystagmus. Brain imaging may be considered when the eye movement is atypical, repositioning does not help as expected, or there are other neurological findings.

Sources

- Bhattacharyya N, Gubbels SP, Schwartz SR, and colleagues. "Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update)." Otolaryngology-Head and Neck Surgery . 2017;156(3 Suppl):S1-S47.
- von Brevern M, Bertholon P, Brandt T, and colleagues. "Benign Paroxysmal Positional Vertigo: Diagnostic Criteria." Journal of Vestibular Research . 2015;25(3-4):105-117.
- Macdonald NK, Kaski D, Saman Y, Al-Shaikh Sulaiman A, Anwer A, and Bamiou DE. "Central Positional Nystagmus: A Systematic Literature Review." Frontiers in Neurology . 2017;8:141.
- Hilton MP and Pinder DK. "The Epley Manoeuvre for Benign Paroxysmal Positional Vertigo." Cochrane Database of Systematic Reviews . 2014;12:CD003162.
- National Institute on Deafness and Other Communication Disorders. "Balance Disorders." National Institutes of Health. NIH Publication No. 00-4374.