What is BPPV?
BPPV is short for benign paroxysmal positional vertigo. That is quite a mouthful, but knowing the meaning of each word helps in understanding this condition:
- **Benign** – not a life-threatening health problem
- **Paroxysmal** – comes and goes in short attacks
- **Positional** (sometimes the term “positioning” is used) – occurs with certain head positions
- **Vertigo** – refers experiencing a spinning sensation, rather than feeling light-headed or woozy.

BPPV is an inner-ear problem. It is defined as sudden attacks of vertigo that last for seconds and usually provoked by certain head positions.

First described in 1921, BPPV is by far the most common cause of vertigo. BPPV affects about 2.5% of people at some point in their lives becomes progressively more common with age, accounting for 50% of older patients presenting with dizziness.

Symptoms of BPPV
The hallmark symptom of BPPV is vertigo that usually lasts less than 60 seconds and usually occurs in bouts. Vertigo may range from mildly annoying to severe enough to cause vomiting and difficulty standing or walking without losing balance. Bouts of vertigo may be frequent for several weeks and then go away. It may then recur several months later. Someone who has had BPPV is likely to get it again, however when is not predictable. Abnormal rhythmic eye movements (nystagmus) usually accompany the symptoms of BPPV.

Causes of BPPV
BPPV is caused by a problem in the balance organs of the inner ear. Tiny calcium carbonate crystals (otoconia) detach from the utricle (gravity receptor organ) where they normally belong and float into one or more of the fluid-filled semi-circular canals (see diagram).

It most commonly affects one of the posterior (rear) canals. When enough of these crystals clump together, normal fluid motion in the canals is disrupted. This causes a false message to be sent to the brain when the head is moved in a certain way. The result is brief spells of vertigo each time that specific head movement is repeated.

There are two types of BPPV: in the first and more common variant, **canalithiasis**, the crystals become free-floating particles; in the second, **cupulolithiasis**, the crystals get stuck on a little hinged area of a canal. Symptoms can be more intense and treatment can be more challenging when BPPV is the cupulolithiasis type.

Risk factors for BPPV include:
- Ear surgery
- Trauma to the head
- Viral ear infections
- Other vestibular disorders such as Ménière’s disease
- Medications that damage the ear (ototoxins)
- Aging
- Unusual head positions, for example leaning your head back for a long time at the dentist or hair dresser

Most cases of BPPV are idiopathic, meaning the cause is unknown.

Diagnosis of BPPV
Diagnosis of BPPV is purely clinical. Imaging tests (X-Rays, CT Scans, MRIs) and other special balance tests are not recommended for diagnosing BPPV.

Most family doctors or an audiologist or physiotherapist with advanced training in vestibular disorders can diagnose a problem with crystals in the posterior semi-circular canal, the most common type of BPPV.

Following a series of questions about your vertigo, your head will be moved in a series of motions called the *Dix-Hallpike manoeuvre*. The examiner will closely observe your eye movements as the manoeuvre is done and ask...
how you are feeling. The direction of your eye movements is used as a clue to diagnosing which canal contains the crystals. As the eye movement is sometimes very rapid (nystagmus), you may be asked to put on special goggles; these connect to a monitor that clearly graphs the movement.

Otolaryngologists (ENTs) or highly specialized neuro-otolaryngologists may need to be consulted to diagnose and/or treat BPPV affecting a lateral or anterior semi-circular canal, several canals at once, cupulolithiasis, or BPPV that is resistant to treatment or recurring.

**Treatment of BPPV**

Repositioning manoeuvres
Most cases of BPPV affect the posterior (rear) canal and can be successfully treated by the Epley manoeuvre, a procedure done in the doctor or physiotherapist’s office. The head is moved through a series of motions to return the crystals to where they belong. Symptoms usually subside immediately after the manoeuvre and the crystals reabsorb over the coming days.

Repositioning manoeuvres for BPPV are about 80 to 90% successful and one treatment is often enough. Sometimes, however, more than one manoeuvre or treatment is needed. If the Epley manoeuvre is not done perfectly or if the head is lifted up, for example, some of the particles may fall backwards or into another canal. Sometimes the examiner sees a different and unexpected eye movement; this indicates that the particles have moved into another canal requiring a different manoeuvre to fix the problem. And sometimes the Epley manoeuvre moves some of the particles but not all, requiring another treatment.

Medication
As BPPV is essentially a mechanical disorder there are no medications that will cure it. Some medications, such as antihistamines and sedatives, act as vestibular suppressants and reduce the spinning sensation of vertigo – using them for a short period of time can help control severe nausea and vomiting. However, because vestibular suppressants slow down the brain’s ability to adjust to the abnormal signals triggered by the particles in the inner ear, they should not be taken for an extended period of time.

Surgery
Surgery to block a canal may be considered if several treatments with repositioning manoeuvres are unsuccessful or if the BPPV continues to recur. Blocking a canal is not a common procedure and is only done after every other treatment has been tried. As fluid can leak out when the canal is plugged, patients are at risk of complete hearing loss in that ear.

Less common variants of BPPV
A minority of patients have less common variants of BPPV. They may have crystals stuck in a canal, in more than one canal, or on both sides of their head. These patients are difficult to diagnose and treat. Their eye movements are complicated and it takes a specialist lot of time, expertise and patience to figure out the problem.

- **Cupulolithiasis** is challenging to treat. The eye movements last longer and can be quite pronounced. Usually Epley manoeuvres alone will not move the clump of particles stuck on the hinged area of the canal. In these cases, a skull vibrator is sometimes successfully applied to convert them to free-floating particles, which are easier to treat.

- **Particles in the horizontal canal** are very troublesome for most patients. Again, the symptoms can be quite pronounced. They are diagnosed by simply watching eye movements as a patient rolls from one side to the other while lying down. It is, however, very complicated to determine which ear is impacted. By analyzing a graph of the rapid eye movements, a neuro-otologist can figure out if the left or right ear is involved. The treatment consists of the aptly named “barbecue roll”; the patient is turned round and round as though on a spit, causing dizziness and discomfort for many individuals.

- The patient frequently inadvertently treats particles in the anterior canal. Because the stones usually are at the top of the head, lying down or sitting up causes them to fall back where they belong. Often patients make themselves better even before they reach the specialist’s office. In some patients, the particles get stuck on the hinged joint and that can be a problem. However the Dix-Hallpike manoeuvre usually fixes this, so many health professionals are coincidentally fixing the problem during testing.

- **Ménière’s disease and BPPV** frequently overlap; you can have both. Canal re-positioning manoeuvres do not work for Ménière’s.