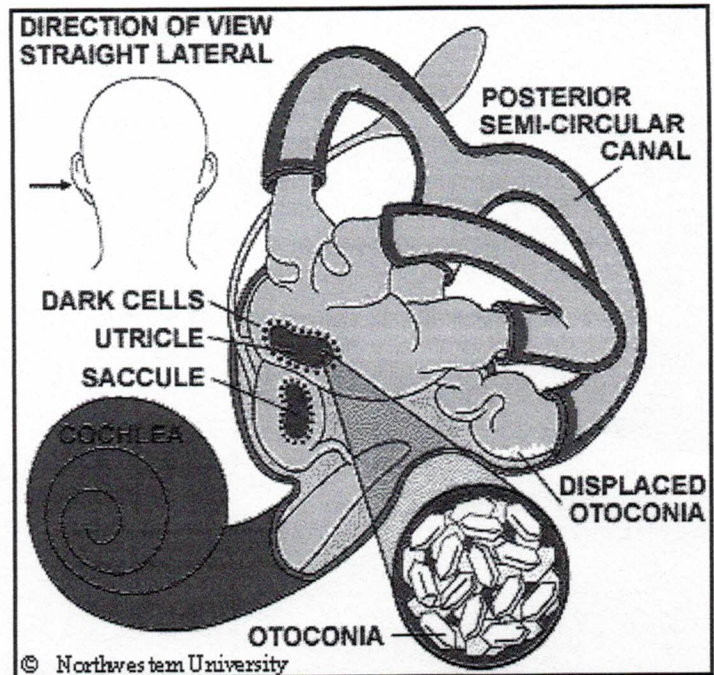




# BENIGN PAROXYSMAL POSITIONAL VERTIGO

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In Benign Paroxysmal Positional Vertigo (BPPV) dizziness is generally thought to be due to debris which has collected within a part of the inner ear. This debris can be thought of as "ear rocks", although the formal name is "otoconia". Ear rocks are small crystals of calcium carbonate derived from a structure in the ear called the "utricle" (figure 1). While the saccule also contains otoconia, they are not able to migrate into the canal system. The utricle may have been damaged by head injury, infection, or other disorder of the inner ear, or may have degenerated because of advanced age. Normally otoconia appear to have a slow turnover. They are probably dissolved naturally as well as actively reabsorbed by the "dark cells" of the labyrinth (Lim, 1973, 1984), which are found adjacent to the utricle and the crista, although this idea is not accepted by all (see Zucca, 1998, and Buckingham, 1999).



BPPV is a common cause of dizziness. About 20% of all dizziness is due to BPPV. While BPPV can occur in children (Uneri and Turkdogan, 2003), the older you are, the more likely it is that your dizziness is due to BPPV. About 50% of all dizziness in older people is due to BPPV. In a recent study, 9% of a group of urban dwelling elders were found to have undiagnosed BPPV (Oghalai et al., 2000).

The symptoms of BPPV include dizziness or vertigo, lightheadedness, imbalance, and nausea. Activities which bring on symptoms will vary among persons, but symptoms are almost always precipitated by a change of position of the head with respect to gravity. Getting out of bed or rolling over in bed are common "problem" motions. Because people with BPPV often feel dizzy and unsteady when they tip their heads back to look up, sometimes BPPV is called "top shelf vertigo." Women with BPPV may find that the use of shampoo bowls in beauty parlors brings on symptoms. A Yoga posture called the "down dog", or Pilates are sometimes the trigger. An intermittent pattern is common. BPPV may be present for a few weeks, then stop, then come back again.

<http://www.dizziness-and-balance.com/disorders/bppv/bppv.html>

## WHAT CAUSES BPPV?

The most common cause of BPPV in people under age 50 is head injury. There is also an association with migraine (Ishiyama et al, 2000). In older people, the most common cause is degeneration of the vestibular system of the inner ear. BPPV becomes much more common with advancing age (Froeling et al, 1991). In half of all cases, BPPV is called "idiopathic," which means it occurs for no known reason. Viruses affecting the ear such as those causing vestibular neuritis, minor strokes such as those involving anterior inferior cerebellar artery (AICA syndrome), and Meniere's disease are significant but unusual causes. Occasionally BPPV follows surgery, where the cause is felt to be a combination of a prolonged period of supine positioning, or ear trauma when the surgery is to the inner ear (Atacan et al 2001). BPPV is also common in persons who have been treated with ototoxic medications such as gentamicin (Black et al, 2004). Other causes of positional symptoms are discussed here.

## HOW IS THE DIAGNOSIS OF BPPV MADE?

Your physician can make the diagnosis based on your history, findings on physical examination, and the results of vestibular and auditory tests. Often, the diagnosis can be made with history and physical examination alone. The figure to the right illustrates the Dix-Hallpike test. In this test, a person is brought from sitting to a supine position, with the head turned 45 degrees to one side and extended about 20 degrees backward. A positive Dix-Hallpike tests consists of a burst of nystagmus (jumping of the eyes). The eyes jump upward as well as twist so that the top part of the eye jumps toward the down side. Click here to see a movie of BPPV nystagmus. (13 meg download). The test can be made more sensitive by having the patient wear Frenzel goggles or a video goggle. Most doctors that specialize in seeing dizzy patients have these in their office.

With respect to history, the key observation is that dizziness is triggered by lying down, or on rolling over in bed. Most other conditions that have positional dizziness get worse on standing rather than lying down (e.g. orthostatic hypotension). There are some rare conditions that have symptoms that resemble BPPV. Patients with certain types of central vertigo such as the spinocerebellar ataxias may have "bed spins" and prefer to sleep propped up in bed (Jen et al, 1998). These conditions can generally be detected on a careful neurological examination and also are generally accompanied by a family history of other persons with similar symptoms.

Electronystagmography (ENG) testing may be needed to look for the characteristic nystagmus (jumping of the eyes) induced by the Dix-Hallpike test. It has been claimed that BPPV accompanied by unilateral lateral canal paralysis is suggestive of a vascular etiology (Kim et al, 1999). For diagnosis of BPPV with laboratory tests, it is important to have the ENG test done by a laboratory that can measure vertical eye movements. A magnetic resonance imaging (MRI) scan will be performed if a stroke or brain tumor is suspected. A rotatory chair test may be used for difficult diagnostic problems. It is possible but uncommon (5%) to have BPPV in both ears (bilateral BPPV).

## HOW IS BPPV TREATED?

- Wait it out
- Office Treatment
- Home Treatment
- Surgical Treatment

BPPV has often been described as "self-limiting" because symptoms often subside or disappear within 2 months of onset (Imai et al, 2005). BPPV is not intrinsically life-threatening. One can certainly opt to just wait it out.

### No active treatment (wait/see):

If you decide to wait it out, certain modifications in your daily activities may be necessary to cope with your dizziness. Use two or more pillows at night. Avoid sleeping on the "bad" side. In the morning, get up slowly and sit on the edge of the bed for a minute. Avoid bending down to pick up things, and extending the head, such as to get something out of a cabinet. Be careful when at the dentist's office, the beauty parlor when lying back having ones hair washed, when participating in sports activities and when you are lying flat on your back.

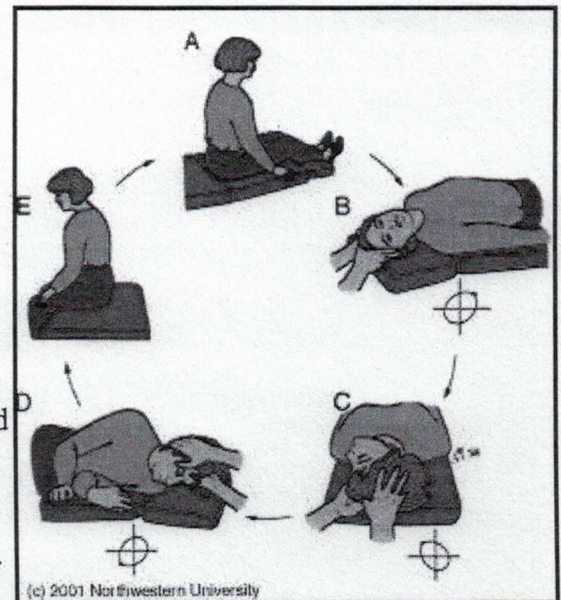
Symptoms tend to wax and wane. Motion sickness medications are sometimes helpful in controlling the nausea associated with BPPV but are otherwise rarely beneficial.

As BPPV can last for much longer than 2 months, in our opinion, it is better to treat it actively and be done with it rather than taking the wait/see approach.

## OFFICE TREATMENT OF BPPV: The Epley and Semont Maneuvers

There are two treatments of BPPV that are usually performed in the doctor's office. Both treatments are very effective, with roughly an 80% cure rate, according to a study by Herdman and others (1993). If your doctor is unfamiliar with these treatments, you can find a list of clinicians who have indicated that they are familiar with the maneuver from the Vestibular Disorders Association ([VEDA](#)).

The maneuvers, named after their inventors, are both intended to move debris or "ear rocks" out of the sensitive part of the ear (posterior canal) to a less sensitive location. Each maneuver takes about 15 minutes to complete. The **Semont maneuver** (also called the "liberatory" maneuver) involves a procedure whereby the patient is rapidly moved from lying on one side to lying on the other (Levrat et al, 2003). It is a brisk maneuver that is not currently favored in the United States, but it is 90% effective after 4 treatment sessions. In our opinion, it is equivalent to the Epley maneuver as the head orientation with respect to gravity is very similar, omitting only 'C' from the figure to the right.



The **Epley maneuver** is also called the particle repositioning or canalith repositioning procedure. It was invented by Dr. John Epley, and is illustrated in figure 2. It involves sequential movement of the head into four positions, staying in each position for roughly 30 seconds. The recurrence rate for BPPV after these maneuvers is about 30 percent at one year, and in some instances a second treatment may be necessary. While some authors advocate use of vibration in the Epley maneuver, we have not found this useful in a study of our patients (Hain et al, 2000).