



VESTIBULAR MIGRAINE

This handout is intended as a general introduction to the topic. As each person is affected differently, speak with your health care professional for individual advice.



Key points

- Repeated spells of dizziness, usually without a headache at the same time.
- Second most common cause of vertigo – affects about 1 out of 100 people.
- Vestibular symptoms include feelings of vertigo, unsteadiness, or dizziness brought on by head movement and other triggers.
- Severity and combination of symptoms usually varies from attack to attack.
- Spells generally last from several hours to several days and may interfere significantly with daily life.
- Sometimes mimics other conditions, making diagnosis challenging.
- Often not recognized or misdiagnosed.
- Usually only a specialist doctor familiar with vestibular migraine can make an accurate diagnosis.
- Management includes avoiding triggers, making lifestyle changes, and taking medication to help stop or take the edge off attacks.
- Vestibular rehabilitation (an exercise-based therapy) should be tried, but only after attacks are well controlled

What is vestibular migraine?

When you think “migraine” you likely think “disabling throbbing headache.” But if you start having repeated attacks of dizziness and other vestibular symptoms without headache pain, you may have vestibular migraine (VM). VM attacks can interfere greatly with everyday life.

“Vestibular” means related to the inner ear motion sensors and the part of the brain that interpret the signals from the sensors. The sensors and brain control balance as well as the way a person experiences the space around them. When these sensors do not work properly, or the brain misinterprets the signals, a person may experience vertigo, imbalance, or dizziness.

A history of migraine headaches with or without aura (temporary and reversible neurological disturbances) usually predates VM. Most people develop VM after having had migraine headache attacks for several years or even decades. However, 3 of 10 people experience VM with no history of migraine headaches.

VM is the most common cause of recurrent spontaneous vertigo attacks lasting for minutes to several days. Spontaneous means happening without any obvious reason. VM is the second most common cause of vertigo after BPPV (benign paroxysmal positional vertigo). Despite being relatively common, VM continues to be underdiagnosed and undertreated.

To define VM vertigo attacks, patients explain a feeling of motion when no motion is taking place or an altered sensation of motion with normal movement. Patients describe this in different ways including a rocking or swaying sensation, a spinning sensation, or a feeling that the ground is moving or falling.

About 1 out of 100 people will develop VM during their lifetime. VM is most common in midlife, but it can happen at any age. The average age of onset is 37 years for females and 42 years for males. VM affects about 10% of all people who suffer from migraine.

Females are 5 times as likely as males to have VM. Episodes can be linked with menstrual cycles.

People with a history of benign paroxysmal vertigo (BPV) of childhood are at risk for developing VM without a history of migraine headache.

People with VM often have a lifelong history of motion sensitivity. Many had carsickness as a child and have motion sickness as an adult.

About half of people with VM have co-morbid (happening at the same time) psychiatric disorders including mood disorders, anxiety, and depression.

VM is often a chronic (persistent and long-lasting) condition. One study showed that almost 30% of people with VM had an increased frequency of episodes over a 9-year observation period, although nearly 50% had a reduced frequency of episodes. In the same study, 90% of those with VM still reported attacks after 9 years.

Vestibular migraine (VM) is the internationally accepted term for this disorder. Some people still call it migraine-associated vertigo/dizziness, migraine-related vestibulopathy, recurrent vertigo, or migrainous vertigo.

What are the causes?

Migraine is a neurovascular headache, meaning it can be triggered by annoyance or disturbance to the nerves or blood vessels in the brain. All migraines are caused by the same type of neurotransmitter dysregulation. Neurotransmission is the process where the brain takes in signals and responds.

Researchers are not certain what causes VM. Some studies suggest an abnormal release of chemicals in the brain may play an important role. Genetics may also play a role. About 80% of people who have migraine report a family history of the condition.

There seems to be an association between VM and other peripheral (inner ear) vestibular disorders, including benign positional paroxysmal vertigo (BPPV) and Ménière's disease, at least in some people. The relationship between these disorders and vestibular migraine is complicated and not yet well understood.

Many experts now think that Ménière's disease and VM are on the same spectrum. Doctors tend to diagnose VM when a person starts out with migraine and then develops dizziness. They tend to diagnose Ménière's disease when a person has vertigo attacks with hearing loss right from the start, and when these attacks are more of a "fast and furious" nature.

Some people may have a peripheral (inner ear) vestibular disorder and VM at the same time.

What are the symptoms?

Vestibular symptoms of VM include:

- **Spontaneous (happening without any obvious cause) vertigo**

Either a false sensation of self-motion or that visual surroundings are spinning or falling. A person with VM may feel as though the ground is moving or falling. A rocking or swaying sensation is often described.

- **Positional vertigo**

Brought on after a change in head position. Patients describe a spinning sensation. This sometimes mimics benign paroxysmal positional vertigo (BPPV).

However, the VM vertigo usually comes on with any movement of the head, not just a specific change in head position. The situation is further complicated because patients with migraines tend to develop BPPV more than those without migraines. If the motion-provoked vertigo goes away on its own in a few days, and cannot be resolved the usual BPPV treatments, it is more likely VM related.

- **Visually induced vertigo**
Triggered by a complex or large moving visual stimulus.
- **Head motion-induced vertigo**
Happening during any movement of the head.
- **Nausea**
Triggered or aggravated by any movement of the head.
- **Sensation of disturbed spatial orientation.**
Many patients describe feeling that the world is tilted, or that they are disconnected from their body, or that the floor falls away from them.

Other reported symptoms include:

- unsteadiness and balance problems
- numb or tingling feeling
- excessive susceptibility to motion sickness
- difficulty concentrating – some patients describe this as “head fog”
- disordered speech
- transient fluctuating hearing loss
- aural fullness (a sense of pressure in the ears)
- tinnitus (ringing in the ears)
- sensorineural hearing loss shown on the results of an audiogram (hearing test)
- sensitivity to light (photophobia), sound (phonophobia) and/or smell (osmophobia)
- extreme physical fatigue or weakness (prostration)
- neck pain
- visual disturbances including seeing light flashes, blind spots, or double or blurred vision – for some people, these are warning signs of a VM attack

The above symptoms vary from person to person as well as from attack to attack. They also vary in severity. Only one, several, or more symptoms may accompany an attack.

VM vertigo can come before, during or after headache pain. There does not seem to be a consistent pattern. It varies from person to person and from attack to attack, even in the same person. It is uncommon for a person to have headache pain and vertigo at the same time. And nearly 30% of VM attacks have no associated headache at all.

The length of attacks varies.

- 30% have attacks lasting minutes.
- 30% have attacks for hours.
- 30% have attacks over several days. Some of these people may take up to a month to recover completely from an episode. However, the core episode rarely lasts longer than 72 hours.
- 10% have attacks lasting 10 seconds or less. These tend to occur repeatedly during head motion, visual stimulation or after changes of head position. The length of episodes is defined as the total period during which the brief attacks repeat again and again. These fleeting attacks can be very disconcerting, particularly for patients with any anxiety.

Clinical experience has shown that VM can be chronic (long-lasting). Some patients report vertigo on most days of the month and others report continuous vertigo. Scientific data on chronic and persistent VM, however, are limited.

How is it diagnosed?

There is no test or imaging that is “positive for vestibular migraine.” Diagnosis is based on the patient’s medical history and clinical criteria.

After first seeing a general practitioner, you will be referred to a neuro-ophthalmologist, otolaryngologist (an ear, nose, and throat doctor or ENT doctor) or neurologist specializing in headaches. The doctor will ask about your medical history as well as your symptoms and how often they occur. The doctor will also do a thorough physical and neurological exam, including an ear exam.

Many of the symptoms of VM are shared with other peripheral (inner ear) vestibular conditions, such as Ménière's disease, benign paroxysmal positional vertigo (BPPV), and vestibular paroxysmia. Other conditions, including transient ischemic stroke (TIA) or “mini-stroke”, vertebrobasilar insufficiency (VBI) posterior circulation stroke, and episodic-ataxia Type 2 (EA2), can have similar symptoms to VM. These similarities in symptoms can add to the challenge of diagnosis.

You may have diagnostic tests to rule out other conditions before getting a final diagnosis. Vestibular testing with goggles can be helpful in differentiating classic forms of inner ear positional vertigo and positional nystagmus (involuntary rapid movements of the eyes) that occurs in VM.

The currently accepted diagnostic criteria for VM, established by the International Headache Society (ICHD-3), are:

- At least 5 episodes of vestibular symptoms of moderate or severe intensity, lasting 5 minutes to 72 hours. Moderate is defined as interfering with but not preventing daily activities. Severe is defined as being unable to continue daily activities.
- A current or past history of migraines with or without aura.
- At least half of episodes are associated with at least one of the following 3 migrainous features:
- Headache with at least 2 of the following 4 characteristics:
 - unilateral (one-sided) location
 - pulsating quality
 - moderate or severe pain intensity
 - aggravation by routine physical activity
- Photophobia (light sensitivity) and (phonophobia) sound sensitivity
- Visual aura (flashes of light or blind spots in your vision)

- Not better accounted for by another ICHD-3 diagnosis or by another vestibular disorder.

Other symptoms that often are part of VM attacks are not included in the ICHD-3 diagnostic criteria because they also occur with various other vestibular disorders.

The number one barrier to treating VM is failed diagnosis. It is estimated that about 20% of VMs are not recognized or are misdiagnosed. Physician and patient bias can be problematical. Some patients find it hard to understand and accept that a migraine can happen without headache.

Some physicians do not know how to recognize these unusual, atypical forms of migraine. The keys to correctly diagnosing VM are identifying a relationship between vestibular symptoms and migrainous features as well as being aware of the many different presentations of this enigmatic condition.

It is important for patients to be persistent.

Do not settle for an off-hand diagnosis of “untreatable vertigo.”

How is it treated and managed?

Effective Treatment options for VM are limited. The goal of current treatment is focused mainly on reducing the frequency of attacks. Strategies include:

- reduction of triggers
- lifestyle changes
- preventative medications
- treatment of comorbidities (meaning having two or more chronic diseases at the same time)
- vestibular rehabilitation therapy
- “rescue” medications

Reduction of triggers

It can be helpful to keep a VM diary for 6 weeks. There are a variety of migraine tracker apps that can be helpful. A diary can help in getting a diagnosis and help you recognize triggers so you can avoid them. Some of the same things that trigger other kinds of migraine can also trigger VM.

Record:

- what time you go to bed and get up
- your activities throughout the day
- how your blood sugar feels
- everything you eat and drink and the time of consumption

The good news is that sticking to a regular routine and making dietary changes has been shown to help most patients. Triggers for VM vary from person to person.

Triggers include:

- **Stress and anxiety**
Migraine in general is closely linked to stress and anxiety. Stress is likely the biggest trigger, experienced by most patients with VM.
- **Certain foods and drinks**
Try to identify foods that trigger your VM attacks. It is likely not a matter of simply giving up one food, such as chocolate. Usually there is more than one trigger or overlapping triggers.
Common triggers include sodium, tyramine, nitrates/nitrites, dairy products, caffeine, alcohol, gluten, carbohydrates, aspartame, and MSG. Not all people have food triggers.
- **Poor sleep**
Lack of sleep is one of the most common triggers for acute VM attacks. Too much sleep is often reported as a trigger as well. Jet lag and changes in a person's work schedule can be triggers for some.
Almost all chronic VM patients – those who are in pain or are dizzy daily – suffer from insomnia.

It is important that this is addressed as it is linked to increased risk of anxiety and depression. Your family doctor may prescribe medications to adjust your mood and improve sleep.

It is important to understand that depression does not cause dizziness – living with chronic dizziness, however, can result in depression.

- **Hunger or dehydration**
Research suggests that skipping meals and not drinking enough fluids are often linked to the onset of migraine.
- **Weather changes or changes in barometric pressure**
Though research is limited, changing weather triggers migraine for some. Thunderstorms with lightning may be the most significant weather-related trigger.
- **Hormonal changes**
These include during menstruation or menopause, and in teenagers. Oral contraceptives may make symptoms worse. Pregnancy offers relief for some, while others have worsening symptoms while pregnant.
- **Smoking**
Smoking does not cause VM in someone who otherwise would not have this condition. However, smoking can contribute to attacks, making them more frequent or worse.
- **Environmental factors**
People with VM often report that perfume and other strong smells, such as chemicals in cleaning products, trigger an attack. Some people report that bright, flickering lights or loud sounds act as a trigger.
- **Overuse of painkillers**
50 to 80% of people with VM overuse analgesics (painkillers). Headaches that accompany VM are exquisitely sensitive to anti-inflammatory medications such as Advil® (ibuprofen) or Tylenol® (acetaminophen). Frequent use of these medications – perhaps

three times a week – can cause rebound headaches. These may happen daily or with greater frequency.

Patients with comorbid disease, such as a bad back or neck, may need to take painkillers to function. Taking them may also play a role in triggering VM or making it worse.

- **Intense exercise**

One study showed that 38% of people with migraine had exercise-triggered migraine attacks at some point.

Lifestyle changes

In addition to avoiding triggers, making lifestyle changes, and keeping a regular routine can help reduce the frequency and severity of VM attacks.

Steps that can help include:

- **Eating a balanced diet**

Nutritional science suggests that it is impossible to identify a single best way to eat. It is important to increase nutritional density, manage your intake of food and liquids, eat protein for healthy muscles, and keep an eye on carbs.

- **Practicing good sleep hygiene**

VM avoidance thrives on routine. People who usually go to bed at the same time and get up at the same time, for example, can bring on a VM attack by sleeping in or getting up early.

- **Taking steps to reduce stress and anxiety**

People with VM may benefit from exercises that calm their nervous system and reduce the intensity of their symptoms.

Cognitive behavioural therapy (CBT) has been shown to be effective in reducing migraine frequency.

People with VM often have anxiety. This sometimes leads to depression.

- **Exercising regularly**

Regular and daily physical activity can also be helpful, but it is best not to exercise during the acute phase of an attack as this may worsen your

symptoms. General activity promotes recovery and overall health.

Helpful strategies to ward off a VM attack while exercising include:

- substituting low-intensity activities for high-intensity ones
- adding electrolytes to your water bottle
- doing a slow warm-up
- not letting your heartbeat rise above a certain prescribed number of beats per minute (this will vary by individual)
- **Taking magnesium citrate**
Supplementation with magnesium citrate (200mg three times a day) and vitamin B2, also known as riboflavin (400mg daily), has been shown to decrease VM in about 10% of people. Supplementation must be tried for 6 weeks before its effectiveness can be evaluated.
- **Avoiding dehydration**
Adequate hydration does more than just stop you from getting thirsty. It can help stop a VM attack in its tracks. Drink water before you feel thirsty or are physically active. Monitor the colour of your pee – a very pale-yellow colour is a sign of good hydration.
- **Paying attention to your neck and back**
How your neck and back move plays a large role in VM. If you have chronic neck and back pain, sitting can send a signal to your brain that sparks pain at the back - or in some cases, the front - of the head.
Even a minor change to a desk- or chair-height can make an enormous difference. If you are employed, ask for a workplace ergonomic assessment. Consider paying for an ergonomic assessment to be done at your home. Stretching every day and icing your neck can also be helpful. Try to change your position regularly and avoid long static postures.

Preventative medication

If you have more than 10 days a month with symptoms, your physician may look at other preventative options. The aim of a preventative medication strategy is to reduce VM by at least 50%. This may particularly help a person with less avoidable triggers, such as changes in hormone levels.

Several medications designed for other disorders can help prevent attacks. They include:

- **Selective serotonin reuptake inhibitors (SSRIs)** or serotonin or serotonin/norepinephrine reuptake inhibitors (**SNRAs**) such as venlafaxine (Effexor XR[®]), amitriptyline (also helps with sleep disorders), and fluoxetine.
- **Anticonvulsants** (anti-seizure drugs) such as gabapentin, valproate and topiramate (TOPAMAX[®]).
- OnabotulinumtoxinA (**BOTOX[®]**) injections are a first choice for migraine treatment. They have no side effects and have worked well in clinical trials.
- **Beta-blockers** such as propranolol. They work on the vascular part of migraines and can help stop the heart rate from increasing during exercise.
- **Calcium channel blockers** such as flunarizine.
- **Calcitonin gene-related peptide (CGRP) monoclonal antibodies (MABs)** are a recent biologic therapy for chronic migraine. AIMOVIG[®] is the first in this new class of drugs available in Canada. CGRP MABs are the only drugs ever developed for chronic symptoms of migraine and outperformed both BOTOX[®] and TOPAMAX[®] in clinical trials.

The above drugs can be very effective, particularly for VM with headache. They may also work for those who have aura alone and daily vertigo.

A person taking preventative medication usually needs to take it daily regardless of symptoms but should follow the advice of their doctor. In the

absence of any other effective treatment, preventative medication should at least be tried.

Vestibular rehabilitation therapy

Once you have started reducing triggers, making lifestyle changes, and trying medical treatments for VM, vestibular rehabilitation therapy can help by increasing your balance confidence and reducing persistent symptoms.

It is very important to have VM under control before starting vestibular rehabilitation. Your dizziness and imbalance will not improve, despite diligence, unless the underlying problem of VM has been addressed adequately. It should be considered for all VM patients. The vestibular therapist can record and effectively communicate your progress to your doctor.

Vestibular rehabilitation is a type of exercise therapy. People with stable VM may be helped by exercises including:

- gaze stabilization
- habituation
- eye tracking
- balance
- hand-eye coordination

It is important to be patient and persevere with the exercises. Do not, however, “push through” your symptoms. Continuing with vestibular rehabilitation when VM symptoms are exacerbated may worsen your VM, increasing the frequency and severity of your symptoms. If vestibular rehabilitation therapy is worsening your migraine attacks, speak to your therapist.

Rescue medications

If the treatments above do not work, some medicines may help “rescue” you. They cannot keep VM from happening, but they may be able to treat it once an attack starts by restoring the balance of serotonin in the brain.

Rescue medications include:

- **Non-steroidal anti-inflammatory drugs (NSAIDs)** such as Tylenol[®], Advil[®], and Graval[®]. Care must be taken with these medicines because the brain is very sensitive to them.
- **Metoclopramide** (IV Maxeran[®]).
- **Triptans** such as zolmitriptan, rizatriptan, almotriptan, and sumatriptan. Research shows that these medications have little effect on dizziness and are more effective in treating headache pain.
- **Antiemetic (preventing vomiting) medications** such as dimenhydrinate (Graval[®]) and benzodiazepines.
- **Intravenous methylprednisolone.**

Living with vestibular migraine

VM is a chronic condition that can significantly interfere with daily life. It can make you feel too debilitated to finish basic tasks, such as sleeping, walking, or driving. Frequent VM can negatively affect your career, education and relationships with family and friends.

Tips for living with VM include:

- At the first sign of an attack, go into a dark room, have a glass of water, and lie down. Essential oils, such as lavender or peppermint, on your temples or under your nose may help.
- Keep a health diary and look for patterns. For example, what foods seem to trigger an attack? Do you get a particular sign that an attack is about to start?
- Consider using a transdermal scopolamine patch (Transderm-V[®]) to prevent motion sickness on long car rides, long-haul flights, or cruises. A patch lasts for 3 days and can be used safely for up to 6 consecutive days (2 patches). Remove the patch immediately after completing your journey.

Alternatively, premedicate with dimenhydrinate (Graval[®]) or another medication recommended by your doctor.

- If you are persistently photophobic (light sensitive), refrain from wearing sunglasses indoors. Sunglass use will aggravate your light sensitivity. Instead, consider lenses with FL-41 optical tints.
- If you have persistent phonophobia (sound sensitivity), avoid constant use of earplugs. Most earplugs make sound intolerance worse. Restrict their use to activities where the sound levels exceed safety limits, such as using a lawn mower.
If your sound sensitivity is severe, consider consulting an audiologist for tinnitus retraining therapy or “pink noise” therapy as these may help.

Understanding a disease can help you cope with it. You may find it helpful to learn as much as you can about VM.

Some people find it helpful to connect with others who have the same condition. Support groups, whether online or in-person, can help you share information and tips, and reassure you that you are not alone.

Many people do not know very much about VM, so you may need to educate your family and friends about it. Let your family and friends know if there are specific things they can do to support you, like helping you avoid dietary triggers.

What to expect in the future

Current diagnostic criteria, set by the International Headache Society (IHS), are likely to evolve. A future revision may include a VM/Ménière's disease overlap syndrome. Further study is needed on different courses of migraine, including chronic and persistent forms.

A small, preliminary study suggests that non-invasive vagus nerve stimulation (nVNS), using a handheld device placed against the neck, may provide rapid relief of acute VM. More research is

needed before nVNS can be recommended as an effective treatment for VM.

There is still a long way to go to serve adequately those suffering from VM, but awareness of this disorder is improving. Knowledge has increased in the last 5 to 10 years, and the outlook for better treatment options is hopeful.

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