Vertigo can last for hours, days or longer – and it's more common than you might think. Why does it happen?

By Samantha Selinger-Morris
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The day that sparked Kathee De Lapp's spiral from being a well person to one who needed to learn to walk again began like any other. She happily drove to her morning university lectures, spent eight hours in classes and then drove herself home. That afternoon, she felt that she might be coming down with a cold. "You know, I felt just kind of lethargic, just generally yuck," she says. "Nothing specific."

When she woke the next morning and rolled over in bed to get up, she felt the room begin to spin. "I could hardly stand straight or walk straight," says De Lapp, who was then 29. "[I was] vomiting for 24 hours. Eventually, there's nothing left in your system. But the convulsions keep coming. Your body is still that violently unwell. And yet, no fever. It was very drastic – black and white – from being normal to being completely incapable."

De Lapp was suffering from vertigo, but didn't know what was causing it. Neither did her doctors. It took seven years of persistent symptoms before the cause was correctly diagnosed. "I couldn't walk across the room," says De Lapp, now a neuro-physiotherapist who treats people with balance disorders. "I essentially had to learn to walk again and navigate and do things. It is an unkind, life-altering problem."

Up to one in three Australians will suffer vertigo at some point in their life. The risk increases as we age. And while vertigo can strike very occasionally or more intermittently, ongoing suffering such as De Lapp's is not unheard of. So, what exactly is vertigo? Are certain people susceptible to it? And can it be cured?

(CREDIT: ARTWORK MONIQUE WESTERMANN, GETTY IMAGES)

What is vertigo?

The 1958 Alfred Hitchcock film *Vertigo* has given many people the impression that vertigo is related to a fear of heights. An ex-cop played by Jimmy Stewart experiences flashbacks after a rooftop chase sees him dangling from guttering several storeys above the street.

But vertigo is not caused by a fear of heights, and isn't the dizziness many of us feel when we look down from the top of a skyscraper. It's also not a condition in and of itself but a symptom of a variety of conditions.

"There's, generally speaking, the idea that if you spin, it's vertigo, and if it's not spinning, it's not vertigo," says Dr Luke Chen, a neurologist and neuro-otologist (a physician who treats diseases of the ear) at Monash and Alfred Health. "That's technically not correct."

"Some people give fairly interesting descriptions of walking along and it's as if the footpath is [moving] or on an angle."

Associate Professor David Szmulewicz

Rather, vertigo is an illusion or sensation of movement when there isn't any movement; and how it feels varies greatly from person to person.

"Some people give fairly interesting descriptions of walking along and it's as if the footpath is [moving] or on an angle, and they know it's not," says Associate Professor David Szmulewicz, a neurologist and neuro-otologist at Royal Victorian Eye and Ear Hospital. "Others will describe a sensation of, 'I turn my head, and it takes a few moments for my brain to catch up'."

Some people feel like they're moving from side to side, or up and down. Others say they feel like they're on a boat, that the room is swaying, or that their head feels like it's spinning.

This might not sound too bad. But it can last for hours, days or even weeks on end, depending on its cause. Dizziness causes vomiting and vertigo often leads to persistent vomiting. (There are direct connections between nerves that travel from our ear to parts of the brain that trigger nausea, says Szmulewicz.) When you can't orient yourself in space, and you don't know when that feeling will end, it can seem like something out of a horror movie.

"You have no idea that anything could feel so earth-shatteringly wrong," says De Lapp, who treats patients at the Hearing and Balance Centre at St Vincent's Hospital in Sydney. "But it does."

There are several types of vertigo. About half of cases are called benign paroxysmal positional vertigo, or BPPV (more on that below). In rarer instances, vertigo is accompanied by bizarre symptoms like an ability to hear your own bodily functions such as your heartbeat (more on that too).

What causes vertigo?

Often, it's caused by damage to a group of tiny organs deep inside our ear that make up our vestibular system, which largely regulates balance. At the heart of the system are three small canals filled with fluid.

As we move our head, the fluid moves along the canals much like water in a bucket when you tip it. It triggers nerves in the canals that send rapid-fire (20 per second) messages to the brain – in particular the cerebellum, which functions as a co-ordination control centre – to tell it how far, fast and in what direction the head is moving. The brain sends messages to our eyes to adjust their position accordingly.

"So the ears are messengers [to the brain]," says Chen. "Now, the brain's going to have to use that information and say, 'OK, the head is moving in that direction, so how do we make our next step?'"

Our vestibular system operates a bit like a stereo, with our left and right ears sending separate signals to our brain. They need to send precisely the same information for us to remain balanced. If one ear becomes damaged, such as by infection, the signals fall out of sync. The brain can't make sense of the different messages, and we lose our balance.

Meanwhile, our eyes move back and forth to make sense of the incompatible information they're receiving and to work out where we're stationed in space. This is called nystagmus, an involuntary, rapid and repetitive movement of the eyes. (They can be moving horizontally, vertically or in a circle.) "Your eye goes wobble, wobble, wobble, wobble," says De Lapp. "You still see, there's no blindness, but all that movement makes no sense at all … And that looks like the room's spinning. So the room spins, and if it does that for five seconds it only takes gravity a fraction for you to fall down."

Or, as Szmulewicz, puts it: "Your world's not moving ... your eyes are moving your world around."

This creates a rare phenomenon ... the ability to hear your own bodily processes, from your heartbeat to your eyes clicking (yes, clicking) as they move from side to side.
One of the most common types of damage that creates these faulty messages is when microscopic crystals in the inner ear become loose. Normally, these crystals made of calcium carbonite are fixed in jelly in our ear canal. "They're a bit like cement between bricks; they keep the lining of your inner ear together," says Chen.

It might not take much for them to become adrift: tilting your head suddenly while turning over in bed to look at your phone, or leaning down to pick up laundry from a basket. The rogue crystals trigger nerve endings that send faulty signals to the eyes, and the spinning begins.

Or, if you're Australian golfer Jason Day, you take a step, look down and collapse, as he did on a US Open course in 2015, struck down by an attack of BPPV. "The vertigo is a difficult thing, it just comes and goes whenever it pleases," Day told CNN. "I've had it before and there have been years between stretches and, unfortunately, it happened at the US Open and that knocked me off my feet."

Other inner ear disorders can cause vertigo too. **Meniere's disease, which changes the level of fluid in the inner ear, is one.** Migraines can also cause vertigo, though doctors aren't entirely sure why.

Though rarer, another trigger is damage to certain parts of the brain, particularly the cerebellum, to the brain stem or to the vestibulocochlear nerve, which sends information from your inner ear to your brain. If the latter becomes swollen, it interrupts the way your brain reads information, causing vestibular neuritis that is usually triggered by a viral infection such as the flu or shingles.

It was vestibular neuritis that nearly derailed the career of Australian tennis player Alicia Molik. "I woke up for a match and basically fell into the wall," Molik reported in 2005 in South Carolina. "I felt like I was in space and everything around me was floating. I couldn't get a sense of where I was." On a practice court, she hit tennis balls into the fence. "So I had no co-ordination. I couldn't fix my focus on a moving object. I felt like I was seeing things almost in third person. It was really scary – really scary."

It took her two years to "fully come through" her vertigo. Along with other injuries, the vertigo left her feeling worn out, and played a part in her retirement in 2008. (She later made a comeback.) "It was a really crap time," she said.

Kathee De Lapp.
CREDIT: BROOK MITCHELL

De Lapp's vertigo was eventually determined to have been caused by a hemangioma, or a benign tumour made up of blood vessels in her brain. The tumour had led to a stroke. "I had

an internal bleed, and it bled into that part of the brain stem where the signal balance goes," she says.

Another rare cause of vertigo is a syndrome called superior canal dehiscence syndrome (SCDS), where there's a hole in the bone that encases the vestibular system in our inner ear. This creates a rare phenomenon called autophony, which is the ability to hear your own bodily processes, from your heartbeat to your eyes clicking (yes, clicking) as they move from side to side. "I often describe it as a sort of bionic hearing," says Szmulewicz. Sufferers may also hear footsteps very loudly, from a great distance away.

"I think the worst thing is these people were told their symptoms were imagined," says Chen, of years gone by. "These symptoms were put down to a psychiatric problem."

On top of this, the hole in the bone means the semicircular canals can move outside the bony box they're normally encased in. "Part of what happens is that you're converting the balance system to be able to respond to sound, which it normally doesn't," says Szmulewicz. "So people get noise-induced dizziness."

The risk of vertigo increases with age. Szmulewicz says certain parts of the vestibular apparatus age "in the same way that hearing reduces with age", which may lead to a greater chance of shedding crystals in your inner ear. And people with osteoporosis are believed to have a higher likelihood of loose inner ear crystals and therefore BPPV.

Kathee De Lapp wears equipment that can diagnose nystagmus, a symptom of vertigo.
CREDIT: BROOK MITCHELL

How do doctors confirm you have vertigo?

Often, the key to an accurate diagnosis is a person's eyes. "The eye movements are breathtaking, I have to say," says Szmulewicz. To elicit them, a doctor may ask a patient to lie down and then will guide them to move their head to the side in a way that is likely to elicit vertigo, if they have it.

"There's a whole set of eye movements that point us to [damage to] the cerebellum and its connections," says Szmulewicz. For instance, if a person looks to the left and their eyes "beat" or jerk to the left, and when they look to the right, and their eyes "beat" or jerk to

the right, it is often an indication of a particular nystagmus that likely results from a lesion in the brain, usually the cerebellum.

To diagnose BPPV, doctors look for different nystagmus; eye movements that move up or have a rotational component.

Specialised CT and MRI scans of the inner ear can detect other causes of vertigo, such as structural damage or inner ear inflammation. Some infections that cause vertigo, such as labyrinthitis, also cause hearing problems – so a hearing test might help.

"You definitely can treat most causes of vertigo very well, once you get the correct diagnosis," says Chen. This is not always a simple process. When patients tell doctors that the emergency room is spinning, they might be tested for evidence of a stroke or even cancer and, if they get the all clear, be given a Panadol or anti-nausea drugs. "You exclude the scary causes and then you go no further," says Szmulewicz. "But you're not offering them a diagnosis and, in general, the best treatments are specific for diagnoses."

"They do get dismissed … and I suppose there's always a bit of stigma, that, well, you've just got to put up with it."

Dr Luke Chen, neurologist and neuro-otologist

Some vertigo sufferers report not being taken seriously. "That's the bane of my day-to-day practice," says Chen whose patients are often at the end of their tether by the time they see him. In part, this is because they haven't necessarily been in the midst of a vertigo attack when they've been examined earlier. "So there's the natural tendency to think the person would be a bit hysterical or embellishing their symptoms, if you like," says Chen. "They do get dismissed … and I suppose there's always a bit of stigma, that, well, you've just got to put up with it."

Explainer

Illness

It's so much more than a headache. What happens in the brain during a migraine?

Patients can be misdiagnosed too. "One of the common ones is they have migraine vertigo and they've been diagnosed with Meniere's disease," says Chen. "Vertigo is perhaps one of the hardest neurological symptoms to deal with. And there are many anecdotal quotes that even experienced [medical] practitioners will sigh at the sight of seeing someone with vertigo … They can feel daunted, or even intimidated, by someone who has complex vertigo." (People can suffer from multiple causes of vertigo at the same time.)

Delays in a correct diagnosis can have knock-on effects. "The studies have shown that 50 per cent of patients suffering from vertigo have anxiety and/or depression," says Chen. "That's clearly higher than the rate of anxiety and depression in the community [about 20 per cent]." Chen, who often sees people suffering from extended periods of vertigo, has

even seen it lead to relationship break-ups. “Relationships with friends, family, work. They can’t go to work. It’s a very difficult condition to manage.”

Neuro-otologist David Szmulewicz in an Epley Omniax machine at the Royal Victorian Eye and Ear Hospital.
CREDIT: ANTHONY BRAGAGLIA

How is vertigo treated?

If BPPV is the cause, a doctor or vestibular audiologist or physiotherapist can perform a “log roll” or an Epley manoeuvre. Both are manual procedures that move the head in a particular way to coax the crystals out of the inner ear canals and into the vestibule where they no longer cause havoc. (A patient can be taught to do the procedures at home themselves.) Other patients with BPPV are treated via an Epley Omniax machine. There are only about 34 of these machine in the world, including one at the Royal Victorian Eye and Ear Hospital and one at Sydney’s Royal Prince Alfred Hospital. They look a bit like an amusement park ride, with a chair in the middle that can turn the sitter upside down and in circles. The person is strapped in and wears infrared goggles, which record the pattern of their eye movements. Computer software recognises certain patterns that indicate which canal is affected by the moving crystals. The clinician then manipulates the machine so that it moves the patient around in a way that resets the inner ear.

If a person’s vertigo was triggered by a virus, such as with vestibular neuritis, they are treated with medication to reduce dizziness, inflammation and nausea, and with vestibular physiotherapy. “It is about teaching the brain to keep the gaze co-ordinated properly,” says De Lapp, who specialises in teaching patients with vertigo various exercises to help them focus.

Dislodged crystals can never become fixed in their jelly again; they can always be dislodged by a sudden movement.

Treatment for vestibular migraine is similar to the treatment for migraine headaches, such as medication and avoiding triggers such as lack of sleep and stress. Those who have Meniere’s disease-induced vertigo are given medication to help alleviate nausea, vomiting and the feeling of spinning.

And, amazingly enough, our brains also naturally compensate for imbalanced messaging it receives from our ears over time. “The brain senses that there’s a difference between the two ears, and that’s the start of a process we call compensation,” says Chen. “That refers to a series of chemical changes at different levels of the brain which are aimed at restoring, if you like, the balance between the two ears … so with time, a person’s balance improves.”

Often, vertigo is only intermittent. A person with BPPV will experience an attack of vertigo that lasts a few seconds and not experience it again for a day or so. Sometimes a fix is as easy as avoiding a particular movement that regularly triggers their BPPV.

The cure depends on the cause. With BPPV, dislodged crystals can never become fixed in their jelly again; even after they’ve been manoeuvred out of the inner ear canals, they can always be dislodged by a sudden movement. “They have periods where they’re absolutely fine,” says De Lapp of some of her patients. “But then they go to pick up something off the floor, and they might fall over.”

Kathee DeLapp is one of the few neuro- physiotherapists in Australia who works exclusively in the area of vestibular rehabilitation. Kathee is recognised as one of Australia's most respected and knowledgeable specialists in the area. She has decades of experience in treating patients with vertigo, dizziness, and imbalance due to inner ear disorders.

Special interests
Vertigo, BPPV, Vestibular migraine, Neuritis, Labyrinthitis and Meniere’s disease