

SECONDARY ENDOLYMPHATIC HYDROPS (SEH)

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

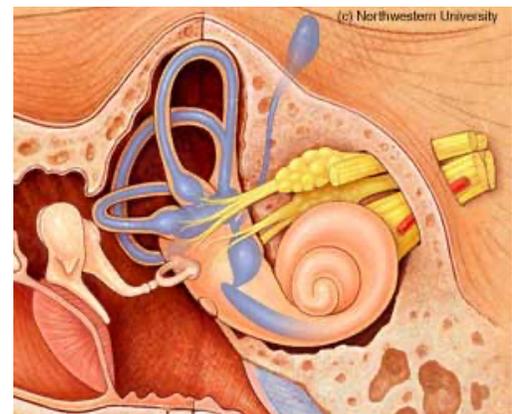
- A build-up of fluid in the inner ear.
- Usually caused by an underlying disease or injury.
- Can happen weeks or months after the triggering event.
- Symptoms include vertigo (spinning sensation), hearing loss, tinnitus (ringing in the ears), and feeling of fullness or pressure in the ears.
- Symptoms change over time and vary from person to person.
- Lifestyle changes and medication may manage mild symptoms.
- Vestibular rehabilitation (an exercise-based therapy) may help with balance problems in later stages.
- Surgery may be recommended in the most severe cases.

What is secondary endolymphatic hydrops?

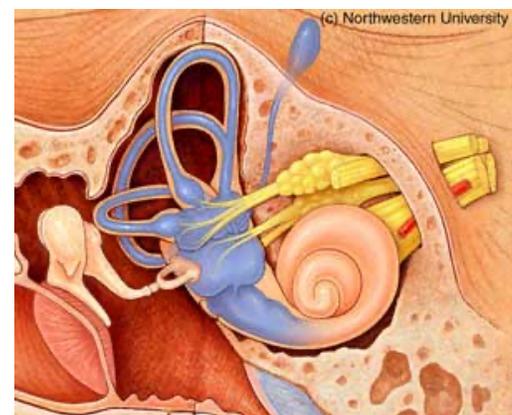
Endolymphatic hydrops (EN-doe-lim-FAT-ick HI-drops) is a build-up of fluid in the inner ear. This can cause vertigo, hearing loss, tinnitus and feelings of ear blockage or fullness.

Primary endolymphatic hydrops happens on its own, without an underlying cause. This is a theory for why Ménière's disease develops.

By contrast, "secondary" means that the fluid build-up was caused by another problem, such as an underlying disease or an injury.



Normal membranous labyrinth



Dilated membranous labyrinth in SEH

What are the causes?

The fluid in the inner ear (known as endolymph) helps the cells in the inner ear to function normally. These cells detect sound, pressure changes, and changes in speed or direction. When there is too much fluid, the cells may not work properly, which can cause hearing loss and vertigo. However, not everyone with endolymphatic hydrops has symptoms.

The build-up of fluid in the inner ear can be caused by trauma (injury) or inflammation. SEH can happen weeks, months or even years after the trigger that caused it. If SEH happens long after a disease, it is known as delayed SEH.

SEH can happen after:

- surgery that affects the inner ear, such as a cochlear implant for deafness, stapedectomy for otosclerosis, or ablation (scarring or destruction) of the endolymphatic sac, which helps to drain fluid from the inner ear
- damage from loud noises near the ear, such as gunshots or explosions, also known as acoustic trauma
- use of certain medications used to balance the amount of fluid in the body
- changes in the pressure of cerebrospinal fluid, the fluid that cushions the brain and spinal cord
- tumors (acoustic neuromas) in the inner ear
- infections such as otitis media or labyrinthitis
- other illnesses that cause inflammation, such as mumps, measles, meningitis, or influenza

It is possible that head injuries can also cause SEH.

What are the symptoms?

The symptoms of SEH include:

- episodes of vertigo (feeling like the room is spinning)
- hearing loss that comes and goes (fluctuates)

- tinnitus (ringing in the ears) that may come and go
- feelings of ear blockage or fullness that may come and go

Some people have hearing loss caused by illness. With delayed SEH, vertigo symptoms can appear months or years later.

How is it diagnosed?

SEH may be diagnosed by a primary care doctor, but it is more often diagnosed by a specialist, such as an otolaryngologist or an otologist.

Your doctor will ask about your symptoms. Try to be as specific as possible about your symptoms and when they get better or worse.

Your doctor will also ask about your medical history, including any medications you are taking or recently stopped taking and any surgeries you have had. Your doctor will also do a thorough physical and neurological exam.

You will probably have some of the following diagnostic tests:

- hearing tests
- vestibular function tests
- balance tests
- blood tests
- imaging (CT or MRI scans)

Some of these tests are done to rule out other health problems. Several other conditions can cause the same symptoms as SEH, so your ear specialist needs to consider all the possibilities before making a diagnosis.

How is it treated and managed?

Treatment for SEH involves identifying and treating what is causing the problem, if possible, as well as making changes that can help make the symptoms less severe.

The treatment or treatments that your healthcare team suggests may depend on:

- your age
- how frequent and severe your symptoms are
- whether you also have other conditions such as migraine, arthritis or allergies

Your ear specialist may want to try lifestyle changes and medication first, especially if your symptoms are mild. If these do not work, other more invasive options may be suggested, such as ear injections or surgery.

Diet

Diet changes are often recommended for people with SEH. Keeping a health diary may help you determine whether or not these changes make a difference. The most common changes are:

- eating a diet that is low in sodium (salt)
- getting less than 100 mg of caffeine per day
- avoiding foods that often trigger migraines and may trigger attacks, including monosodium glutamate (MSG), chocolate, red wine, dairy products, and aged or pickled foods
- drinking water to stay well hydrated

Medication

Medications that may be prescribed for SEH include:

- Diuretics, also known as “water pills,” are often prescribed to reduce the fluid build-up in the inner ear. They do not work for all patients, and they may have side effects.
- Medications to reduce the frequency of attacks, such as antihistamines
- Medications to reduce the severity of vertigo or nausea during attacks, such as dimenhydrinate (Gravol®) or sometimes diazepam (Valium®)

Be sure to tell your doctor about all the medications you are taking, including vitamins, minerals, and herbal, homeopathic or over-the-counter medications. These can sometimes cause side effects or make other medications less effective.

Avoiding triggers

Some people find that specific things trigger attacks of vertigo. Triggers may include:

- food and drink, such as high salt intake, caffeine or certain foods
- alcohol
- smoking or using tobacco
- physical activity
- allergies
- illness
- stress, overwork, tiredness, or fatigue
- environmental factors, such as pressure changes, loud environments, bright or flashing lights or certain visual patterns like stripes

Your doctor may suggest that you keep a diary keep a diary of your symptoms and possible triggers to see if there are any patterns. If you find that certain things trigger attacks, it is a good idea to avoid them as much as you can.

Ear injections

If medication and lifestyle changes are not enough, more invasive treatments may be needed. Some treatments involve injecting medication into the middle ear through the eardrum (transtympanic injections). In most cases, these treatments are done over several sessions.

- Steroid injections may be helpful in some cases. The goal of this treatment is to reduce inflammation. There is evidence that steroid injections are effective in reducing the frequency and severity of spells. With steroids, there is little risk of hearing loss.
- Gentamicin is an antibiotic that damages the cells of the ear and destroys the part of the ear that controls balance. In most cases, patients who have this treatment no longer have vertigo. But there is a risk of hearing loss with this treatment. People may also have balance

problems after the treatment; if this happens, vestibular rehabilitation can be helpful.

Surgery

Rarely, if other treatments do not work, and vertigo is severely affecting your quality of life, one of the following types of surgery may be recommended:

* Endolymphatic sac decompression, where the surgeon removes bone from around the sac that drains fluid from the inner ear. Vertigo symptoms get better in about two-thirds of patients who have this surgery, although about the same number of patients improve without surgery. One advantage of this surgery is that it does not affect hearing. There is a small risk of spinal fluid leak with this procedure.

- **Vestibular neurectomy**, where the surgeon cuts the nerve that goes from the balance portion of the inner ear to the brain. For most patients, attacks go away completely after this procedure. But it is major surgery with a risk of side effects, including spinal fluid leak, infection or stroke.
- **Labyrinthectomy**, where the surgeon removes the entire inner ear. This surgery is usually very successful at stopping symptoms, but it also causes total loss of hearing in the affected ear. It is usually done only in older patients or patients who already have profound hearing loss.

Most patients will have some symptoms after vestibular neurectomy or labyrinthectomy, including dizziness, blurred vision, and unsteadiness. Usually, they will need vestibular rehabilitation. Be aware that any destructive form of treatment comes with a risk. You may end up with bilateral vestibular loss and have more serious impairments.

Vestibular rehabilitation and balance retraining

Vestibular rehabilitation is a type of exercise-based therapy. Its goal is to help your body and brain relearn how to balance. Some people find that it helps them be more confident when doing their

everyday activities. But it will not prevent future attacks. Vestibular rehabilitation is not usually recommended in the early stages of SEH, if you have symptoms that come and go, because the brain cannot adjust to the fluctuating nature of the disorder. Later on, if balance symptoms remain, vestibular rehabilitation may be helpful.

Coping with attacks

Attacks can happen suddenly, so it's important to be prepared. Talk to your doctor about what medications you can take when you have an attack. Ask if there are any situations where you should call your doctor or go to a hospital.

Keep supplies available. These might include a fleece blanket, a thin pillow, a yoga mat, kidney-shaped trays to capture vomit, a cup of water and "bendy" straws, and a face cloth.

During an attack, try to do the following:

- Lie flat on a firm surface such as the floor.
- Try not to move your head.
- Try to keep your eyes open and fixed on an object that isn't moving.
- Don't eat or drink much.
- If you cannot keep down any liquids because of vomiting for longer than 24 hours, call your doctor.

After an attack, you may feel sleepy. It is OK to rest for a short time, but as soon as you can, try to get up slowly and move around carefully so that you can regain your balance.

Let your friends and family know how to recognize an attack and what they can do to help you. Attacks can be quite long, so have a strategy for extended support. Share your preferred plan for care with friends, relatives and employers.

What to expect in the future

SEH is different in different people, so your doctor probably will not be able to tell you exactly what to expect. Some people have mild symptoms and only one or two attacks. Other people have severe symptoms and frequent attacks. For many people, the disease follows a pattern of remission and exacerbation, meaning that the symptoms get better for a while and then get worse again.

SEH changes over time. For many people, the vertigo attacks eventually go away on their own, but the tinnitus and pressure usually stay the same and the hearing loss usually gets worse. People may have constant balance problems in the later stages of the disease.

In the later stages of SEH, some people have episodes where they fall to the ground with no warning, but do not lose consciousness. These are called Tumarkin's otolithic crisis or simply drop attacks. Some people only have one drop attack; others have several over the course of six months to a year. In most cases, drop attacks go away on their own, or they can be treated with steroid injections. Some people never develop drop attacks.

From time to time, opportunities may arise to participate in clinical trials studying new treatments for SEH.

Visit our website

View this and other articles about vestibular disorders – www.balance&dizziness.org.

In addition, find information about how the balance system works, the journey from diagnosis to treatment, building a wellness toolkit, and more.

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