

Ear problems

Ear problems are not uncommon amongst divers. There are essentially two different causes: inflammation and barotrauma. You should never dive if you have ear problems.

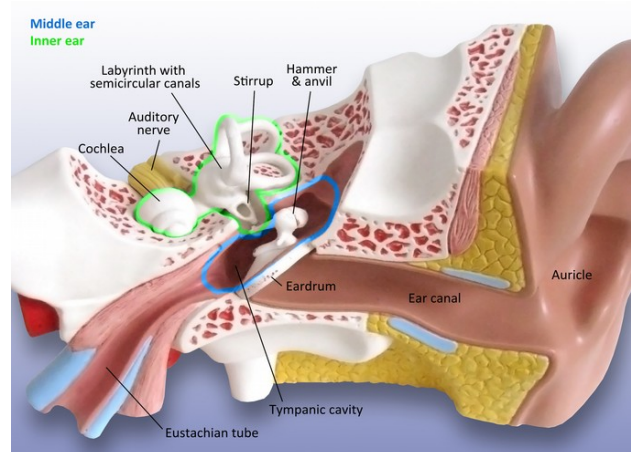
Inflammation of the external ear canal (otitis externa) is the most common ear infection amongst divers. This infection is caused by stagnant moisture in the ear canal and is therefore particularly common among people who are frequently in the water, i.e. swimmers and surfers. Within just a few hours or days, a mild itch may develop into an often very painful inflammation. Pressure pain of the tragus, the small flap of ear directly in front of the ear canal opening, as well as when pulling on the ear conch are typical symptoms. In the beginning, pressure equalisation usually doesn't cause any problems but may become painful later. Your hearing is also not impaired initially. If the skin of the ear canal becomes severely swollen due to inflammation, however, your hearing may be reduced.

Even the slightest injury to the sensitive skin of the ear canal may be a trigger and injuries can be caused by e.g. improper cleaning with cotton buds, wearing earplugs or irritation caused by salt crystals and wind. Even too much ear wax together with moisture provides a good breeding ground for bacteria and fungi. If you regularly suffer from ear infection during your diving holidays, you should consult an ENT doctor before your trip.

If you have an outer ear infection, carefully rinsing the ear canals with clean tap water, drying your ears with a hair dryer after diving and using alcohol and vinegar based disinfectant ear drops, antiseptic ear drops or sprays or pure alcohol can help in mild cases. These measures may be carried out as a precaution in the event of recurring ear infections.

Severe infections require the use of antibiotics – in this case usually in the form of ear drops or strip inserts. The active ingredient ciprofloxacin is often used. These ear drops are only available on prescription. Some divers carry them in their medical kit in case they are needed. Anti-inflammatory pain relief such as Ibuprofen or Diclofenac is also often needed for the severe pain. If symptoms do not improve within a few days, you should visit a doctor.

A **middle ear infection** is not a typical diving illness. However, you can get one when diving with a cold or when you cannot equalise the pressure sufficiently during air travel. Here, germs reach the tympanic cavity via the Eustachian tube. Reduced hearing on the affected side is typical and accompanied by a severe, throbbing earache that you get during a cold. Fever, dizziness and light-headedness may also occur. The eardrum may rupture in the event of severe inflammation, causing a discharge of pus.



It is important to distinguish between a middle ear infection and an external ear canal infection, as treatment is completely different. Ear drops are ineffective for middle ear infections because they cannot penetrate the eardrum. First and foremost, it must be ensured that the middle ear is well ventilated. This is achieved by using nasal sprays or drops (e.g. with the active ingredients xylometazoline or oxymetazoline), which reduce congestion in the mucous membrane of the nose and the Eustachian tube. Pain-relieving and anti-inflammatory medication such as ibuprofen (or paracetamol if intolerant) is used for this purpose. In severe cases, antibiotics must also be taken.

Barotrauma, on the other hand, occurs during a dive. The pressure differences during descent and ascent can cause damage to the middle and inner ear. Most affected divers report problems with pressure equalisation preceding the earache and a hearing loss. This is due to an accumulation of fluid in the normally air-filled middle ear. When trying to equalise the pressure, the ear squeaks and smacks. Sometimes only a dull feeling of pressure is noted, occasionally combined with dizziness. Barotraumas are common amongst beginner divers who 'forget' to equalise

pressure regularly due to the complex demands of diving.

In extreme cases, the eardrum can rupture, which is associated with very severe dizziness due to cold irritation of the inner ear and can cause a diving accident. If severe pain suddenly occurs during the dive or pressure equalisation, this is usually an indication of a severe strain on the eardrum or a rupture. If cold water penetrates the middle ear through a rupture, this often results in dizziness, which can lead to disorientation and panic.

Germans can penetrate the tympanic cavity from the outside through the ruptured eardrum and cause a middle ear infection. If a rupture is suspected, it must always be assessed by a doctor so as to determine the necessary treatment and prevent any further damage. Some ear drops containing alcohol or certain antibiotics may permanently damage the inner ear if the eardrum is ruptured and must therefore not be used.

In addition to painkillers, decongestant nasal drops are recommended in order to improve air supply to the middle ear via the Eustachian tube and to promote the discharge of secretions from the middle ear through the nose. Antibiotics are often prescribed in tablet form for ruptured eardrums in order to prevent an inflammation until the rupture has closed. Small ruptures often heal by themselves although an operation may be necessary for larger ruptures.

In case of a perforated eardrum, diving is not permitted until the injury is fully healed, which can take several months. This should be followed by a new fitness to dive examination.

Ear problems can also indicate a decompression sickness: if you develop symptoms such as significant vertigo or severe loss of hearing during the first minutes to hours after a dive, please consult a doctor immediately.

An overview of the three most common causes of ear problems from onset to treatment:

	Otitis externa	Barotrauma	Decompression sickness
Onset	Within hours to days	Suddenly	Minutes to hours after ascending
Symptoms	Itching, pain, loss of hearing	Feeling of pressure, pain, loss of hearing	Vertigo, loss of hearing, tinnitus, rash and other symptoms
Causes	Frequent contact with water, damage to the ear canal skin	Ignoring pressure equalisation problems, cold, allergies, lack of experience	Nitrogen bubbles
Typical Signs	Pressure pain of the tragus, ear conch pain	Starts during the dive	After dives, emergency ascent, dives close to / in excess of no-decompression limits
Prevention	Don't manipulate the ear canal, keep ears dry, rinse with tap water	Tube training, descend and ascend slowly, take care with pressure equalisation	Don't exceed no-decompression limits, ascend slowly, Nitrox using air tables
Self treatment	Antibiotic ear drops, avoid water, painkillers	Decongestant nasal drops, no diving	Oxygen, fluids, rest
When to contact a doctor	If there is no improvement, after 2-3 days	If there is no improvement, if there is a discharge of pus from the ear canal, if you have a fever	!!! ALWAYS !!! at least contact the diving medicine emergency hotline