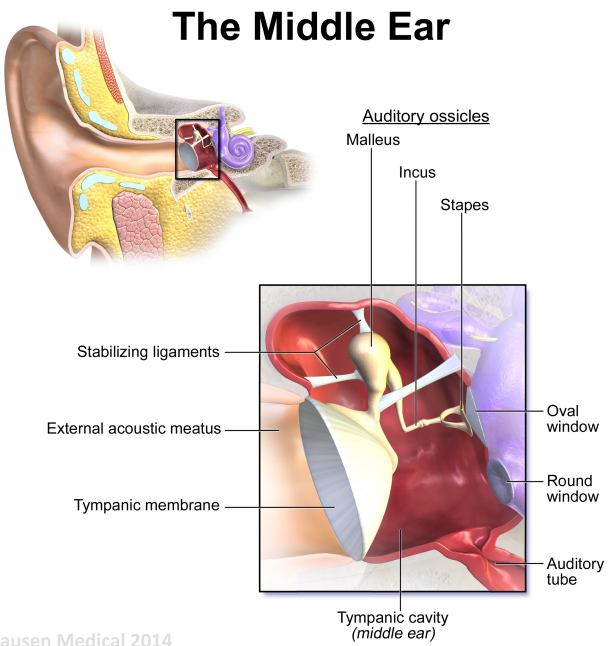
Middle ear barotrauma

A slight feeling of pressure in the ear – which diver doesn't know that feeling! If it increases while diving down, however, and it becomes painful, it is often too late – you have a **middle ear barotrauma.**

We can use simple methods to prevent or minimise middle ear barotrauma.

The **middle ear** is the space between the eardrum and cochlea, where the ossicles are located. Through the Eustachian (or auditory) tube, it is connected to the nasopharynx, allowing air to get into it This happens unconsciously several 100 times every day while a person chews, swallows or yawns and the Eustachian tube opens for a nanosecond.



Blausen Medical 2014

Every diver knows that it is necessary to equalise pressure in the ears when you dive down.

There are different techniques, which all achieve the same thing: the Eustachian tube opens and air flows from the nasopharynx into the middle ear, which is crucial for diving.

Due to the increase in ambient pressure, the air in the middle ear is compressed while at the same time the water pressure in the ear canal presses the ear drum in the direction of the middle ear.

If the pressure is not equalised in time, the pressure drop initially becomes noticeable through an unpleasant feeling of pressure. If, despite that, they dive down further, they will experience pain and the mucous membrane of the middle ear releases secretions, which leads to hearing loss in the middle ear.

If the pressure difference is even bigger, there may be bleeding and the ear drum may burst, which leaves a hole in the middle ear. An opening is created in the eardrum through which water flows from the outside into the middle ear, often causing severe dizziness. A burst ear drum is often more boring than painful, but diving is out of the question for a few months afterwards. An attack of vertigo under water can also lead to further complications!

A middle ear barotrauma can also occur while going back up to the surface. During this time, there is a relative overpressure in the middle ear. If the air cannot escape through the Eustachian tube, it pushes the ear drum painfully outwards, which may also lead to a tear. This disorder is called reverse blockage or reverse barotrauma.

If you have ear problems after a dive during which you had problems with pressure equalisation, a middle ear barotrauma is the most probable cause. In this case, decongestant nasal drops with the active ingredients xylometazoline) or oxymetazoline or hypertonic saline solution, decongestant painkillers (e.g. Ibuprofen) and a break from diving until the symptoms have fully subsided should help.

The application of decongestant nasal drops before a dive is controversial. There is a risk that the effect may already wear off during the dive to such an extent that reverse barotrauma may occur on surfacing - we therefore do not recommend prophylactic use immediately before a dive.

In order to avoid a middle ear barotrauma, you should always dive down only as far as the pressure equalisation works! Regular practice and learning different techniques for pressure equalisation, diving down carefully, no diving with a cold and sufficient fluid intake help to avoid a middle ear barotrauma.

Medical Helpline Worldwide GmbH
Otto-Lilienthal-Straße 18, Bremen
www.medical-helpline.com