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## Perforated Eardrum

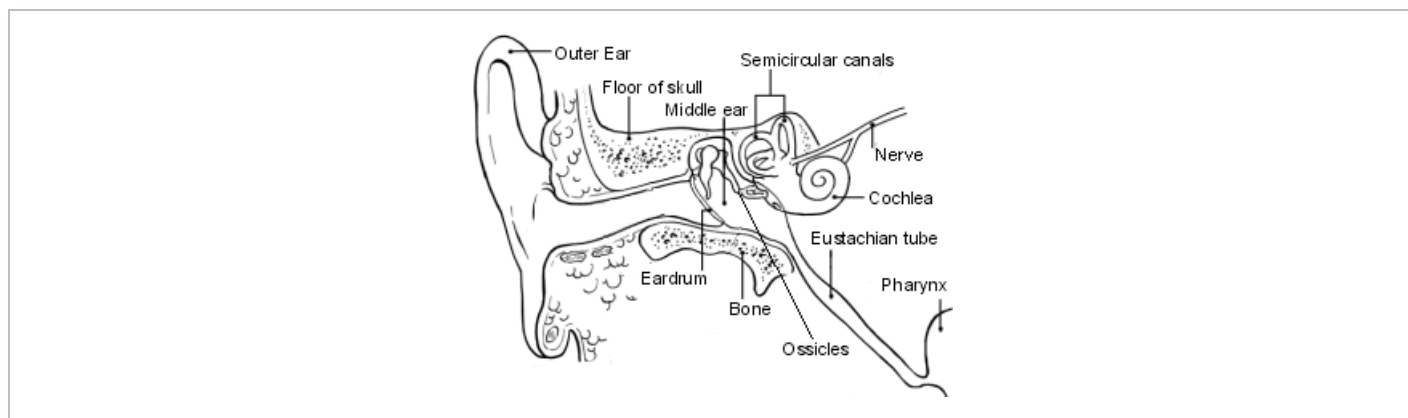
A torn (perforated) eardrum is not usually serious and often heals on its own without any complications. Complications sometimes occur such as hearing loss and infection in the middle ear. A small procedure to repair a perforated eardrum is an option if it does not heal by itself, especially if you have hearing loss.

### What is a perforated eardrum?

A perforated eardrum is a hole or tear that has developed in the eardrum. It can affect hearing. The extent of hearing loss can vary greatly. For example, tiny perforations may only cause minimal loss of hearing. Larger perforations may affect hearing more severely. Also, if the tiny bones (ossicles) are damaged in addition to the eardrum then the hearing loss would be much greater than, say, a small perforation which is not close to the ossicles.

With a perforation, you are at greater risk of developing an ear infection. This is because the eardrum normally acts as a barrier to bacteria and other germs that may get into the middle ear.

### What is the eardrum and how do we hear?



The eardrum (also called the tympanic membrane) is a thin skin-like structure in the ear. It lies between the outer (external) ear and the middle ear.

The ear is divided into three parts - the outer, middle and inner ear. Sound waves come into the outer ear and hit the eardrum, causing the eardrum to vibrate.

Behind the eardrum are three tiny bones (ossicles). The vibrations pass from the eardrum to these middle ear bones. The bones then transmit the vibrations to the cochlea in the inner ear. The cochlea converts the vibrations to sound signals which are sent down a nerve to the brain, which we 'hear'.

The middle ear behind the eardrum is normally filled with air. The middle ear is connected to the back of the nose by the Eustachian tube. This allows air in and out of the middle ear.

### Perforated eardrum symptoms

There may be no symptoms, or there may be symptoms associated with the cause of the perforation - most often this is an infection.

Possible symptoms include:

- Changes in how you hear, that may range from slightly muffled to significant loss.
- Noises in your ear - buzzing or ringing ([tinnitus](#)).
- Aching or pain in your ear.
- Itching in your ear.
- Fluid leaking from your ear.
- A high temperature.

If your perforated eardrum is caused by a middle ear infection, you may have earache which suddenly gets worse when the drum perforates but then quickly gets better. This is because the perforation will allow pus to be released from behind the eardrum and relieves the pressure on the eardrum.

The symptoms will usually pass once your eardrum has healed and any infection has been treated.

## Perforated eardrum causes

Causes include:

- **Infections of the middle ear**, which can damage the eardrum. In this situation you often have a discharge from the ear as pus runs out from the middle ear.
- Direct injury to the ear - for example, a punch to the ear.
- A sudden loud noise - for example, from a nearby explosion. The shock waves and sudden sound waves can tear (perforate) the eardrum. This is often the most severe type of perforation and can lead to severe hearing loss and ringing in the ears (tinnitus).
- Barotrauma. This occurs when you suddenly have a change in air pressure and there is a sharp difference in the pressure of air outside the ear and in the middle ear. For example, when descending in an aircraft. Pain in the ear due to a tense eardrum is common during height (altitude) changes when flying. However, a perforated eardrum only happens rarely in extreme cases. [See the separate leaflet called Barotrauma of the Ear for more details.](#)
- Poking objects into the ear. This can sometimes damage the eardrum.
- Grommets. These are tiny tubes that are placed through the eardrum. They are used to **treat glue ear**, as they allow any mucus that is trapped in the middle ear to drain out from the ear. When a grommet falls out, there is a tiny gap left in the eardrum. This heals quickly in most cases.

## How is a perforated eardrum diagnosed?

A doctor can usually diagnose a torn (perforated) eardrum simply by looking into the ear with a special torch called an otoscope. However, sometimes it is difficult to see the eardrum if there is a lot of inflammation, wax or infection present in the ear.

## Treatment for a perforated eardrum

### No treatment is needed in most cases

A torn (perforated) eardrum will usually heal by itself within 6-8 weeks. It is a skin-like structure and, like skin that is cut, it will usually heal. In some cases, a doctor may prescribe antibiotic medicines if there is an infection or risk of infection developing in the middle ear whilst the eardrum is healing.

It is best to avoid water getting into the ear whilst it is healing. For example, your doctor may advise that you put some cotton wool or similar material into your outer ear whilst showering or washing your hair. It is best not to swim until the eardrum has healed.

### Medical treatment

Occasionally, a perforated eardrum gets infected and needs **antibiotics**. Some ear drops can occasionally damage the nerve supply to the ear. Your doctor will select a type that does not have this risk, or may give you medication by mouth.

### Surgical treatment is sometimes considered

A small operation is an option to treat a perforated drum that does not heal by itself. There are various techniques which may be used to repair the eardrum, depending on how severe the damage is. This operation may be called a myringoplasty or a tympanoplasty. These operations are usually successful in fixing the perforation and improving hearing.

However, not all people with an unhealed perforation need treatment. Many people have a small permanent perforation with no symptoms or significant hearing loss. Treatment is mainly considered if there is hearing loss, as this may improve if the perforation is fixed. Also, swimmers may prefer to have a perforation repaired, as getting water in the middle ear can increase the risk of having an ear infection.

If you have a perforation that has not healed by itself, a doctor who is an ear specialist will advise on whether treatment is necessary.

## Further reading & references

- [Castro O, Perez-Carro AM, Ibarra I, et al; Myringoplasties in children: our results. Acta Otorrinolaringol Esp. 2013 Mar-Apr;64\(2\):87-91. doi: 10.1016/j.otorri.2012.06.012. Epub 2012 Dec 20.](#)
- [Kumar N, Madkikar NN, Kishve S, et al; Using middle ear risk index and et function as parameters for predicting the outcome of tympanoplasty. Indian J Otolaryngol Head Neck Surg. 2012 Mar;64\(1\):13-6. doi: 10.1007/s12070-010-0115-4. Epub 2011 Feb 2.](#)
- [British National Formulary \(BNF\); NICE Evidence Services \(UK access only\)](#)
- [Venekamp RP, Prasad V, Hay AD; Are topical antibiotics an alternative to oral antibiotics for children with acute otitis media and ear discharge? BMJ. 2016 Feb 4;352:i308. doi: 10.1136/bmj.i308.](#)

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