Introduction
A perforated eardrum is a common condition. The eardrum is a thin layer of tissue at the end of the ear canal inside the ear. Eardrum perforations aren’t usually a serious condition. But they can lead to decreased hearing and repeated infections.

This reference summary will help you understand what an eardrum perforation is. It discusses the causes, symptoms, diagnosis and treatment options. It also talks about how to prevent eardrum perforations.

Anatomy
Our ears are very specialized organs that allow us to hear and keep our balance.

The ear has three parts:
- The outer ear, which includes the auricle and the ear canal. The ear canal goes inside to the eardrum. The medical term for eardrum is tympanic membrane.
- The middle ear, which is made of 3 small bones called the ossicles.
- The inner ear, or the cochlea.

The eardrum blocks bacteria from getting into the middle ear. If the eardrum tears apart, or ruptures, bacteria can easily get into the middle ear and cause an infection.

Our eardrums help us hear. Sound waves enter the ear canal and make the eardrum vibrate. When the eardrum, or tympanic membrane, vibrates, the three small bones of the middle ear also vibrate and send the vibration to the inner ear.
Vibrations sent to the inner ear are changed into electrical signals. A nerve called the 8th nerve carries the electrical signals to the brain, which understands them as sounds.

A section of the inner ear, as well as the 8th nerve, are responsible for aspects of balance. This is why hearing problems and balance problems often happen at the same time.

The Eustachian tube is a small passage way that connects the middle ear to the upper part of the throat.

When a person has a cold or flu, the Eustachian tube can become blocked by mucus or from swelling. If this happens, the Eustachian tube can’t open to allow air to get to the middle ear. If the Eustachian tube remains plugged, fluid from the middle ear isn’t able to drain and starts to build up in the middle ear, causing an ear infection. The medical term for ear infection is otitis media.

**Causes**

The most common cause of a perforated eardrum is middle ear infection, or otitis media. Ear infections are caused by fluid buildup in the middle ear.

In severe ear infections, as fluid accumulates and cannot escape through the blocked Eustachian tube, pressure builds up in the middle ear. The pressure causes the eardrum to become perforated, or torn a little bit. It is important to seek medical attention if you or your child seems to have an ear infection.

The eardrum can also become perforated by changes in surrounding air pressure. This can happen when an airplane is landing or when a diver is diving. If the Eustachian tube cannot adjust the pressure in the ear fast enough, the eardrum could rupture, or rip apart. Sometimes the cause of an eardrum rupture is a combination of a middle ear infection and changes in surrounding air pressure.

To help equalize pressure in your ears when you fly or dive, plug your nose and swallow or blow inside your mouth. Chewing gum also helps when you fly.

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The eardrum can also become perforated by accident or injury. This is called trauma. Examples of trauma include:

- Slaps to the ear.
- Blasts from gunshots or explosions.
- Objects in the ear, such as cotton-tipped swabs.

It is important to protect your ears from noise when operating loud machinery or firearms. The middle ear should not be cleaned with long, cotton-tipped swabs.

**Symptoms**

The signs of a perforated eardrum can be mild or severe. Some people feel discomfort in their ears. Others feel intense pain when it happens.

A clear, pus-filled or bloody drainage may come out of the ear.

Some people feel ringing, roaring, buzzing or clicking in the ear. Continuous buzzing in the ears is also called tinnitus. Over time, a person with a perforated eardrum may notice hearing loss.

When water gets inside the middle ear through the perforation, it can cause people to lose their balance, feel dizzy and feel as if the world is spinning around them. This happens because the ears also help give us our sense of balance.

When water gets inside of one ear, it causes that ear to become slightly colder than the other, making a person feel imbalanced. This tends to happen with swimmers or people who get water in their ears while showering or bathing.

**Complications**

A ruptured tympanic membrane, or ruptured eardrum, is not usually a serious condition. In many cases it heals on its own. But if it doesn’t heal and the rupture becomes larger from repeated infections or trauma, it could have serious complications.

A torn eardrum affects a person’s hearing. The larger the tear or hole is, the greater the hearing loss can be. Children can get ruptured eardrums from having repeated ear infections.

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A child who has frequent ear infections could suffer from poor hearing at a critical time. Without good hearing, it’s almost impossible for a child to learn how to speak and verbalize different sounds. The child could develop speech or language disabilities.

A hole in the eardrum could let bacteria and fungus into the inner ear. This increases a person’s chances of getting ear infections.

In rare situations, an untreated middle ear infection can travel from the middle ear to the nearby parts of the head, including the brain. This can cause more severe complications.

Symptoms of such infections include:
- Stiff neck.
- Severe headache.
- Difficulty talking or opening the mouth.
- Vomiting.
- Pain in the bone behind the ear.
- Sudden changes in vision.
- Numbness in the face.

You should see your health care provider immediately if you develop a fever or headache or if the pain in your ear becomes very severe. You should also see your health care provider if you feel spinning sensations and abrupt changes in your hearing.

**Diagnosis**

Based on your symptoms and medical history, your health care provider may suspect an eardrum perforation. He or she will look into your ear with a special lighted instrument called an otoscope to see the hole or tear.

If the hole is too small, your health care provider may not be able to identify it. He or she may send you to an ear specialist called an otolaryngologist.

Your health care provider may order a hearing test, called an audiogram, to determine if you have hearing loss.
Treatment

Small tears or holes in the eardrum heal on their own without any treatment. This could take from a few weeks to months.

During this healing period, you should keep your ear dry and avoid sneezing with your mouth closed. Here are some tips to help treat tears in the eardrum:

When taking a shower or bath, place a cotton ball in your ear and seal it with Vaseline. You could also wear a shower cap to prevent water from getting inside your ear.

When you have to sneeze, open your mouth and let the air come out of your mouth. Instead of blowing your nose forcefully, wipe it gently. Strong pressure in your mouth can go through your Eustachian tube to your ear and disrupt the eardrum as it rebuilds the tissue.

If an eardrum perforation does not heal on its own, your health care provider may recommend closing it surgically. Closing a perforated eardrum may improve hearing, prevent frequent ear infections and reduce tinnitus, or ringing in the ear.

Surgically closing a perforated eardrum may also prevent a condition called cholesteatoma. This is a cyst made of skin tissue in the middle ear. It can cause middle ear infections and damage the structure of the ear.

For swimmers who lose their balance when water goes through their perforated eardrum, the surgery may allow them to swim again.

If you are not a swimmer and do not have recurring ear infections, your health care provider may recommend a hearing aid instead of surgery. Ear plugs help protect the middle ear from contamination while bathing.

If your health care provider recommends repairing your eardrum, he or she will recommend the appropriate procedure for you.

This could be a simple procedure in your health care provider’s office where the edges of the perforation are stimulated to grow again with special drugs. In these cases, a piece of paper is put over the hole to act as a bridge for the new tissue to grow on.
Your health care provider may recommend surgery in the hospital operating room under general or local anesthesia. This is called tympanoplasty.

During a tympanoplasty, the surgeon places a tissue patch across the eardrum hole. Like the paper patch, the tissue patch acts as a bridge where tissue can grow and heal the eardrum. The source of the tissue can be muscle, vein or fat from your body. The procedure usually takes about 1 or 2 hours.

Tympanoplasty is often successful in closing the tear or hole permanently and restoring hearing. You may be able to go home on the day of your procedure.

Prevention
Eardrum perforation can be prevented by following these 5 tips.
1. Get treatment for middle ear infections before they become severe and damage your eardrum.
2. Prevent middle ear infections by washing your hands and avoiding people who have the cold or flu.
3. Do not insert objects in your ear canal, including cotton swabs or hairpins to clean them.
4. Protect your ears from loud noises with earmuffs or earplugs.
5. When riding in an airplane, chew gum when it takes off and when it lands. If you feel pressure in your ears, plug your nose and swallow or blow inside your mouth to equalize the pressure.

Summary
Our eardrums help us hear and protect our inner ears. They can become perforated by repeated middle ear infections. Injury, loud noises and external air or water pressure can also cause eardrums to tear.

The eardrum can heal on its own when the hole is small. If it does not, the health care provider can recommend a surgical procedure to patch it and help it heal.

The most important step you can take to prevent eardrum perforation is to treat your ear infections or your children’s ear infections right away.