



Ear Infection

Next to common cold, an ear infection is the most common childhood illness. In fact most children have had at least one ear infection by the time they are three years old. Ear infections clear up without causing any long lasting problems most of the time. But if they occur often or are not treated, they can lead to hearing loss or other damage.

How do ear infections develop?

The ear has three main parts: the outer ear, middle ear and inner ear. A tiny tube called the Eustachian tube connects the middle ear to the back of the throat and nose. In children Eustachian tube is short, more horizontal and lining of it is less mature than adults, so they are more prone to ear infections. It drains fluid from middle ear to throat and equalizes pressure between these two body parts.

When a child has a cold, nose or throat infection or allergy the eustachian tube can become blocked causing a buildup of fluid in the middle ear. If this fluid becomes infected by bacteria or a virus it can cause swelling of the eardrum and pain in the ear. This type of ear infection is called **acute otitis media**. Pus develops as the body tries to fight the infection. More fluid accumulates and pushes against the eardrum, causing pain and sometimes a loss of hearing.

Most ear infections are caused by viruses (40%). Up-to 80% ear infections clear up by them self. Hearing loss is of greatest concern for young children because normal hearing is critical in developing basic speech and language skills.

Worldwide, medical experts are rethinking the treatment of ear infections, because the vast majority of ear infections resolve on their own and because of the growing number of bacteria that are developing [resistance to antibiotics](#).

In the United States, where antibiotics were once the standard treatment for ear infections, some doctors are now taking more of a wait-and-see approach. In some European countries, antibiotics are not prescribed routinely for simple ear infections. This precaution has led to significantly fewer strains of antibiotic-resistant bacteria than are seen elsewhere. Many physicians feel that efforts to reduce antibiotic resistance outweigh the uncertain risk of a child possibly developing a [complication](#)

Often after the symptoms of acute otitis media clear up, fluid remains in the ear. (Some hearing loss that is usually mild and temporary returns to normal once the fluid disappears); there are often no other noticeable symptoms. This fluid often lasts up to 3 months and in most cases disappears on its own. Children with otitis media with effusion may have a feeling of stuffiness in their ears and may not hear well. Hearing usually returns to normal after the fluid behind the eardrum clears. Close follow-up is necessary.

Risk Factors:

There are several risk factors for developing childhood ear infections, including:

- **Age** - Infants and young children are more likely to get ear infections. The size and shape of their eustachian tubes make it easier for fluid to build up. Ear infections occur most often in children between 3 months and 3 years of age.
- **Weather** - Children get more ear infections in winter.
- **Crowding** - Day care center attendee with many children in class may be reason for frequent ear infections.

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- **Heredity** - Ear infections can run in the families. Children are more likely to have repeated middle ear-infections if a parent or sibling also had repeated ear infections.
 - **Colds/Allergies** - Colds often lead to ear infections. Children in-group childcare settings have a higher chance of passing their colds to each other because they are exposed to more germs and viruses from the other children. Allergies that cause stuffy noses can also lead to ear infections.
 - **Tobacco smoke** - Children who breathe in someone else's tobacco smoke have higher risk of developing health problems including ear infections.
 - **Pacifier use after 12 months of age.** Babies who continue to use a pacifier after they have reached 12 months of age are more likely to develop ear infections.
 - Children with anatomic deformities like cleft-lip, cleft palate or weak immune system are more likely to develop ear infection.
 - **Bottle-feeding** - Babies who are bottle fed especially when they are lying down, get more ear infections than breastfed babies. If you bottle-feed your child, hold his/her head above the stomach level during feedings. This keeps the eustachian tubes from getting blocked.

Factors that increase the risk for repeated ear infections also include:

- **Ear infections at an early age.** Babies who have their first ear infection before 6 months of age are more likely to have other ear infections.
- **Persistent fluid in the ear.** Fluid behind the eardrum that lasts longer than 2 to 10 weeks after an ear infection increases the risk for repeated infection.
- **Prior infections.** Children who have had an ear infection within the previous 3 months are more likely to have another ear infection, especially if the infection was treated with antibiotics.

Symptoms of an ear infection:

Your child may have a number of symptoms during an ear infection. Knowing what these symptoms may be helping you get medical care, more quickly if needed.

- **Pain** - The most common symptom of an ear infection is pain. While older children are able to tell you when their ears hurt, younger children may only appear irritable and cry. This may be more noticeable during feedings because sucking and swallowing may cause painful pressure changes in the middle ear. As a result of this discomfort, your child may have less appetite. A child with an ear infection may also have trouble sleeping because lying down can increase ear pain.

Pain and crying usually last for 3 to 4 hours. After that, most children have some pain on and off for up to 4 days, although young children may have intermittent pain for up to 9 days.

There are other reasons besides an ear infection why your child's ear may hurt. They may pull on ears, because nerve supply for ear parts, throat and nose is the same, so any problem in this area may reflect as ear pain. In these cases, your child probably has an earache, not an ear infection. Ear pain can be caused by:

- An ear infection of the skin of the ear canal, often called "swimmer's ear"
- Blocked or plugged eustachian tubes from cold and allergies

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- A sore throat
 - Teething or sore gums or tooth infection.
 - Any foreign object in the ear canal
 - **Fever** - Another sign of an ear infection is a temperature ranging from 100 F to 104F. Fever generally lasts about 1 to 2 days.
 - **Ear drainage** - You might also notice yellow or white fluid, possibly blood-tinged, draining from your child's ear. The fluid may have a foul odor and will look different from normal earwax (which is orange-yellow or reddish-brown). Pain and pressure often decrease after this drainage begins but this does not always mean that the infection is going away. If your child needs to travel in an airplane or wants to swim contact us for specific instructions.
 - Irritability, loss of appetite, and vomiting.
 - Some children do not have any symptoms with this condition.

Difficulty hearing - During and after an ear infection your child may have trouble hearing for several weeks. This occurs because the fluid behind the eardrum gets in the way of sound transmission. This is usually temporary and clears up after the fluid from the middle ear drains away. Most children have some fluid (which may not be infected) behind the eardrum 2 weeks after treatment for an ear infection. This is considered normal. In about 60% of cases, the effusion clears in 1 month. However, about 10% of children still have fluid behind the eardrum 3 months after an ear infection clears.

Watchful waiting may be all that is needed. The fluid behind the eardrum may resolve on its own and not cause any problems.

Because your child can have trouble hearing without any other symptoms of an ear infection, watch for the following changes in behavior (especially during or after a cold) that may mean he/she cannot hear well:

- Saying "huh"? Or "what"? More than usual
- Not responding to sounds
- Having more trouble understanding language in noisy rooms
- Listening with the TV or radio turned up louder than usual

This hearing loss is expected; when fluid clears up on it's own, hearing returns to normal in most cases, it might take 3 months or more. Older children may feel blocked ear or muffled sound.

In severe cases, too much fluid can increase pressure on the eardrum until it ruptures, allowing the fluid to drain. When this happens, fever and pain usually go away, the infection clears, and the eardrum usually heals on its own in about 2 weeks. It is very important to have treatment in this case, because if not treated properly it can lead to more complication.

Treatment of ear infections:

If your child has an ear infection, does not seem very sick, and is not at risk for [complications](#), we may ask you to monitor your child a couple days before deciding whether to prescribe antibiotics. Not all ear infections need antibiotics. Wait-and-see approach can reduced the use of antibiotics by 76%. Since

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majority of time ear infection is due to viruses, it resolves by itself. Nature is great and it fights back with body's resistance power and cures some bacterial ear infection too. So sometimes we advise to wait and watch if ear infection is mild.

We may prescribe antibiotic as part of treatment. Antibiotics kill bacteria.

- Some antibiotics are more effective at killing certain bacteria than other antibiotics.
- Some antibiotics kill many different kinds of bacteria, whereas other antibiotics kill only a few kinds of bacteria.

Antibiotics are effective in most cases of ear infections. However, only 1 out of 8 children with ear infections need antibiotics to clear an ear infection. In 7 out of 8 children, ear infections clear on their own. There is 10% chance that prescribed antibiotic may not work.

Prescribing antibiotics too often can create resistant bacteria and make antibiotics less effective when you really need them. It also kills good bacteria in other parts of the body. If we may prescribe an antibiotic, make sure your child finishes the entire prescription. If you stop the medication too soon, some of the bacteria that caused the ear infection may still be present and cause an infection to start all over again. As the infection starts to clear up your child might feel a "popping" in the ears. This is a normal sign of healing.

Sometimes an ear infection does not go away even after your child takes an antibiotic. **Your child's ear pain and fever should go away within 2-3 days of starting the antibiotics.** If fever or pain persists after three days, please call us. We may need to prescribe a different antibiotic. Children with ear infections do not need to stay home if they are feeling well.

Common side effects of antibiotics include:

- Nausea or vomiting.
- Mild diarrhea.
- Another infection, often due to another kind of organism, such as oral [thrush](#) or [vaginal yeast infections](#).

Less common and more serious side effects of antibiotics include:

- Skin rashes, hives, or itching.
- Severe allergic reaction (rare).

Drug resistance or antibiotic resistance

Organisms, especially bacteria that cause disease or illness can become resistant to medications used to treat those diseases or illnesses. When this happens, the drugs are no longer effective at killing or controlling the organisms that cause the disease. The organisms have become resistant to the drug (drug-resistant or antibiotic-resistant).

Many forms of bacteria have become resistant to the most common types of antibiotics used to treat the illnesses those bacteria cause. For example, several strains of the bacteria that cause tuberculosis can no longer be killed by many antibiotics. Bacteria that cause sinus, ear, and lung infections are also often resistant to many common antibiotics. These strains are called antibiotic-resistant bacteria. Frequent antibiotic use and the use of antibiotics to prevent infections (such as ear infections) are contributing to the

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spread of drug-resistant bacteria. If you are prescribed an antibiotic, take all of the medication as directed, even if you feel better. Do not use leftover antibiotics to treat another illness.

To help with pain we may recommend an over-the-counter non-aspirin medicine, such as acetaminophen. Do not give aspirin to your child; it has been associated with Reye's syndrome, a disease that affects the brain and liver.

Take reasonable precautions:

Your child can go outside and does not need to cover the ears. He/she can also swim as long as there is no perforation (tear) in the eardrum or drainage of fluid from the ear. A trip to the mountains or air travel is generally safe. Just have your child swallow fluids, suck on a pacifier or chew gum during the 30 to 60 minutes that the airplane is descending to help relieve any pressure buildup in the middle ear.

If your child is old enough to chew gum without swallowing it give him/her sugarless gum to chew. Keep your children sitting up as much as possible; this may help lessen pressure on the middle ear and ease the pain. An extra pillow at night may also help. Do not get panicky in the middle of the night. Give your child appropriate dose of Tylenol or Motrin/Advil, it takes 1 to 2hrs for relief of pain. If you have any questions call us or bring your child to be seen next day. Don't keep giving more than one or two doses of pain medicine without consulting us. Most of the time antibiotics take 48-72 hrs to work. It's not a magic stick. If you don't feel comfortable call us. Antibiotics may cause some loose stool and it will go away when you finish the antibiotic, if it is excessive call us.

Complications from untreated ear infections:

Although it is very rare, complications from untreated ear infections can develop, including:

- Thickening of eardrum and rigidity of ear bones can develop if ear infection persists and is called "tympanosclerosis". It can result in permanent hearing loss if not treated properly.
- An infection of the inner ear that causes dizziness and imbalance(labyrinthitis)
- An infection of the skull behind the ear (mastoiditis)
- An infection of the membranes around the brain and spinal cord(meningitis)
- Facial paralysis
- Permanent hearing loss
- Eardrum may form pocket, it's called "cholesteatoma" which requires surgery.

Follow-up exams for ear infections

Checkups after an ear infection are very important for making sure the infection has cleared, checking for fluid behind the eardrum, and preventing complications.

- Even if your child seems to recover well after an ear infection, see us at the scheduled follow-up visit.
- If your child does not seem to be getting better in three days or if the infection seems to come back, see us sooner.

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- If your child still has ear pain that has not improved, has a fever (101°F (38.33°C) or higher), or is irritable or vomiting after 72 hours of treatment, see us.

Younger children may need to have earlier follow-up visits after an ear infection to check for persistent fluid behind the eardrum.

- Babies under 1 year old should have a follow-up visit in about week, even if they seem to have recovered well.
- Children between 1 and 3 years of age may need a follow-up visit in 1 to 2 weeks. If fluid behind the eardrum persists for 3 months, the child should have his or her hearing tested.

Treatments for repeated ear infections:

It is normal for children to have several ear infections when they are young - even as many as two separate infections within a few months.

Although repeated ear infections can be frustrating for you and your child, they are usually only a temporary problem and will likely improve, as your child gets older. Most children stop getting ear infections by the time they are 4 years old.

Surgically inserted tubes:

Another type of treatment for preventing repeated ear infections is an outpatient operation in which tubes are inserted under anesthesia through the eardrums. Tubes may also be used in cases of otitis media with effusion that last longer than 3 months and include some hearing loss. In this procedure a small cut is made in the child's eardrum and fluid in the middle ear is drained out. Then a tiny plastic tube is fit into the slit. The tube acts as a ventilator, allowing air to get into the middle ear. This lessens the risk of harmful bacteria becoming trapped in the middle ear and causing another ear infection.

The tube insertion is based on the following factors:

- How long your child has had fluid in his/her ears
- The number of recent ear infections your child has had
- Failure of other treatments
- A significant hearing loss or other middle ear symptoms
- The age of your child

Most tubes come out of the eardrum on their own between 6 to 18 months after they are put in. Rarely it may come out itself within few weeks. Sometimes they must be removed surgically. While the tubes are in place, the child needs to take extra precautions. A child who has ear tubes however, should not put his/her head under water when swimming. Wearing earplugs while bathing or swimming will help keep water out of the ear canal. Swimming in a chlorinated pool is generally safe, because the water is relatively clean. However, water in lakes, ponds, rivers, and even the bathtub may contain bacteria, and children should take care not to immerse their heads.

Very rarely adenoidectomy is recommended in children older than 4 year of age but it is not helpful in younger children. Tonsillectomy has not been shown to cure or improve middle ear fluid in children.

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All surgery has risks, even the insertion of tubes. Minor complications occur in up to half of children who have tubes inserted. Complications may include:

- A thickening of the eardrum over time.
- Drainage from the ear (otorrhea).
- The tube may become blocked.
- The eardrum may burst after the tubes come out, as that part of the eardrum may be weakened.
- A mass may grow on the eardrum (cholesteatoma).

Up to one-third of children who have tubes inserted have to have tubes inserted more than once

Most ear infections that develop in children are minor. They are bothersome and uncomfortable, but they usually clear up without causing any lasting problems. It is important, however that you contact us at the first sign or symptom of an ear infection so that we can monitor the ear infection, decide when to check your child and prescribe treatment, if necessary. If ear infections keep occurring or do not clear up on their own, they can cause other problems that may permanently affect your child's hearing and possibly speech. With proper care and treatment, ear infections can almost always be managed successfully.

Prevention:

Careful attention to your child's care, environment, and health may help prevent some middle ear infections.

You may decrease your child's chances of getting an ear infection by:

- Not smoking. Ear infections are more common in children who are exposed to cigarette smoke in the home. If you cannot stop smoking, smoke outside the house.
- Breast-feeding your baby. There is some evidence that breast-feeding helps reduce the risk of ear infections, especially if frequent ear infections run in your family. If you bottle-feed your baby, don't let your baby take a bottle while he or she is lying down.
- Washing your hands regularly. Regular hand-washing when you have a cold or are caring for a child who has an upper respiratory infection will help prevent the spread of infection.
- Having your child immunized. Current immunizations do not specifically prevent ear infections. However, immunizations prevent illnesses caused by organisms that are associated with ear infections, such as [Haemophilus influenzae \(Hib\)](#) and [influenza](#). Children are at an increased risk for otitis media if they have their first Hib vaccine when they are older than 6 months. Pneumococcal vaccine called Prevnar can prevent 34% of ear infections caused by the pneumococcal bacteria, and 6% of all ear infections.
- Taking your child to a smaller child care center. Fewer children mean less exposure to respiratory and ear infections. Children can pick up antibiotic-resistant strains of bacteria from other children in child care settings.
- Not using a pacifier. Try to wean your child from his or her pacifier before about 6 months, when it is easier. Babies who continue to use their pacifiers after 12 months of age are more likely to develop ear infections.

Call our office immediately if:

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- Your child develops a stiff neck or severe headache.
- Your child starts acting very sick.
- Your child can't walk normally.
- The pain is severe. (the child is screaming).
- The earache followed by injury.
- Your child has sudden hearing loss, drainage from the ear, or dizziness.
- You notice significant redness, swelling, or pain behind or around your child's ear, especially if he or she does not move the muscles on that side of his or her face.

Call our office within 24 hours if:

- The fever or pain is not gone after your child has taken the antibiotic for 48 hours.
- Your child vomits the antibiotic or refuses to take it.
- You feel your child is getting worse.

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