# Middle Ear Infection (Otitis Media)

## What is middle ear infection?

Middle ear infection is a bacterial infection of the middle ear space behind the eardrum. It usually is a complication of a cold, occurring after the cold blocks off the eustachian tube (the passage connecting the middle ear to the back of the throat).

It can occur in one or both ears. Otitis media is the most frequent diagnosis recorded for children who visit physicians for illness. It is also the most common cause of hearing loss in children.Although otitis media is most common in young children, it also affects adults occasionally. It occurs most commonly in the winter and early spring months. Child's ear is painful because trapped, infected fluid puts pressure on the eardrum, causing it to bulge. Other symptoms are irritability and poor sleep.

Most children will have at least one ear infection, and over one fourth of these children will have repeated ear infections. In 5% to 10% of children, the pressure in the middle ear causes the eardrum to rupture and drain a yellow or cloudy fluid. This small hole usually heals over the next week. Children are most likely to have ear infections between the ages of 6 months and 2 years, but they continue to be a common childhood illness until the age of 8 years.

## Is it serious?

Yes, it is serious because of the severe earache and hearing loss it can create. Hearing loss, especially in children, may impair learning capacity and even delay speech development. However, if it is treated promptly and effectively, hearing can almost always be restored to normal.

Otitis media is also serious because the infection can spread to nearby structures in the head, especially the mastoid. Thus, it is very important to recognize the symptoms (see list) of otitis media and to get immediate attention from your doctor.

## How does the ear work?

The outer ear collects sounds. The middle ear is a pea sized, air-filled cavity separated from the outer ear by the paper-thin eardrum. Attached to the eardrum are three tiny ear bones. When sound waves strike the eardrum, it vibrates and sets the bones in motion that transmit to the inner ear. The inner ear converts vibrations to electrical signals and sends these signals to the brain. It also helps maintain balance.

A healthy middle ear contains air at the same atmospheric pressure as outside of the ear, allowing free vibration. Air enters the middle ear through the narrow eustachian tube that connects the back of the nose to the ear. When you yawn and hear a pop, your eustachian tube has just sent a tiny air bubble to your middle ear to equalize the air pressure.

What causes otitis media?

Blockage of the eustachian tube during a cold, allergy, or upper respiratory infection and the presence of bacteria or viruses lead to the accumulation of fluid (a build-up of pus and mucus) behind the eardrum. This is the infection called acute otitis media. The build up of pressurized pus in the middle ear causes earache, swelling, and redness. Since the eardrum cannot vibrate properly, hearing problems may occur.

Sometimes the eardrum ruptures, and pus drains out of the ear. But more commonly, the pus and mucus remain in the middle ear due to the swollen and inflamed eustachian tube. This is called middle ear effusion or serous otitis media. Often after the acute infection has passed, the effusion remains and becomes chronic, lasting for weeks, months, or even years. This condition makes one subject to frequent recurrences of the acute infection and may cause difficulty in hearing.

What will happen at the doctor's office?

During an examination, the doctor will use an instrument called an otoscope to assess the ear's condition. With it, the doctor will perform an examination to check for redness in the ear and/or fluid behind the eardrum. With the gentle use of air pressure, the doctor can also see if the eardrum moves. If the eardrum doesn't move and/or is red, an ear infection is probably present.

Two other tests may also be performed:

•Audiogram – This tests if hearing loss has occurred by presenting tones at various pitches.

•Tympanogram – This measures the air pressure in the middle ear to see how well the eustachian tube is working and how well the eardrum can move.

The importance of medication

The doctor may prescribe one or more medications. It is important that all the medication(s) be taken as directed and that any follow-up visits be kept. Often, antibiotics to fight the infection will make the earache go away rapidly, but the infection may need more time to clear up. So, be sure that the medication is taken for the full time your doctor has indicated. Other medications that your doctor may prescribe include an antihistamine (for allergies), a decongestant (especially with a cold), or both.

Sometimes the doctor may recommend a medication to reduce fever and/or pain. Analgesic ear drops can ease the pain of an earache. Call your doctor if you have any questions about you or your child's medication or if symptoms do not clear.

What other treatment may be necessary?

Most of the time, otitis media clears up with proper medication and home treatment. In many cases, however, further treatment may be recommended by your physician. An operation, called a myringotomy may be recommended. This involves a small surgical incision (opening) into the eardrum to promote drainage of fluid and to relieve pain. The incision heals within a few days with practically no scarring or injury to the eardrum. In fact, the surgical opening can heal so fast that it often closes before the infection and the fluid are gone. A ventilation tube can be placed in the incision, preventing fluid accumulation and thus improving hearing.

The surgeon selects a ventilation tube for your child that will remain in place for as long as required for the middle ear infection to improve and for the eustachian tube to return to normal. This may require several weeks or months. During this time, you must keep water out of the ears because it could start an infection. Otherwise, the tube causes no trouble, and you will probably notice a remarkable improvement in hearing and a decrease in the frequency of ear infections.

Otitis media may recur as a result of chronically infected adenoids and tonsils. If this becomes a problem, your doctor may recommend removal of one or both. This can be done at the same time as ventilation tubes are inserted.

Allergies may also require treatment.

So, remember

Otitis media is generally not serious if it is promptly and properly treated. With the help of your physician, you and/or your child can feel and hear better very soon.

Be sure to follow the treatment plan, and see your physician until he/she tells you that the condition is fully cured.

What are the symptoms?

In infants and toddlers look for:

•pulling or scratching at the ear, especially if accompanied by other symptoms ◦ hearing problems

◦ crying, irritability

◦ fever

◦ vomiting

◦ ear drainage

In young children, adolescents, and adults look for:

•earache

•feeling of fullness or pressure

•hearing problems

•dizziness, loss of balance

•nausea, vomiting

•ear drainage

•fever

Remember, without proper treatment, damage from an ear infection can cause chronic or permanent hearing loss.

Restrictions

Your child can go outside and does not need to cover the ears. Swimming is permitted as long as there is no perforation (tear) in the eardrum or drainage from the ear. Air travel or a trip to the mountains is safe; just have your child swallow fluids, suck on a pacifier, or chew gum during descent. Your child can return to school or day care when he or she is feeling better and the fever is gone. Ear infections are not contagious.

Ear recheck

Your physician will schedule a return appointment in 2 to 3 weeks for your child. At that visit, the eardrum will be looked at to be certain that the infection is cleared up and more treatment isn't needed. Your physician may also want to test your child's hearing. Follow-up exams are very important, particularly if the infection has caused a hole in the eardrum.

How can I help prevent ear infections?

If your child has recurrent ear infections, it's time to look at how you can prevent some of them. The following list includes ways you can help your child prevent ear infections. If some of the following items apply to your child, try to use them or talk to your health care provider about them.

Protect your child from second-hand tobacco smoke. Passive smoking increases the frequency and severity of infections. Be sure no one smokes in your home or at day care.

Reduce your child's exposure to colds during the first year of life. Most ear infections start with a cold. Try to delay the use of large day care centers during the first year by using a sitter in your home or a small home-based day care.

Breast-feed your baby during the first 6 to 12 months of life. Antibodies in breast milk reduce the rate of ear infections. If you're breast-feeding, continue. If you're not, consider it with your next child.

Avoid bottle propping. If you bottle-feed, hold your baby at a 45° angle. Feeding in the horizontal position can cause formula and other fluids to flow back into the eustachian tube. Allowing an infant to hold his own bottle also can cause milk to drain into the middle ear. Weaning your baby from a bottle between 9 and 12 months of age will help stop this problem.

Control allergies. If your infant has continuous nasal secretions, consider an allergy as a contributing factor to the ear infections, especially if your child has other allergies such as eczema. A milk protein allergy is most likely the problem.

Check the adenoids. If your toddler constantly snores or breaths through his mouth, he may have large adenoids. Large adenoids can contribute to ear infections. Talk to your physician about this.