

## Middle Ear Fluid

### What is ear fluid?

Fluid is normally produced in the middle ear (the space behind the eardrum) in small amounts. Usually the fluid drains out of the ear through the eustachian tube into the back of the nose. Ear fluid can cause a problem when it builds up in the middle ear. This condition is called otitis media with effusion, or secretory otitis media.

### What causes ear fluid to build up in the middle ear?

After an ear infection, the eustachian tube may be temporarily blocked and fluid will build up in the middle ear space instead of draining out normally. After taking antibiotics for the ear infection, your child may still have fluid left in the middle ear, but it is no longer infected fluid.

If there is fluid in the middle ear, you will probably have:

- A full, congested sensation in the ear
- Mildly reduced hearing (temporary).

There is no earache or fever.

### How long will it last?

Because the middle ear fluid clears up by itself in 90% of children, no treatment is needed for most children. The fluid will slowly go away.

- By 1 month, 50% of children will still have fluid.
- By 2 months, 20% of children will still have fluid.
- By 3 months, only 10% of children will still have fluid.

If there is still fluid in the ear after 3 to 4 months, your child will probably need ventilation tubes or special medicines because the fluid will most likely not clear up by itself.

### What is the treatment?

## 1.Help your child with temporary hearing loss

Most children with middle ear fluid have a mild hearing loss (20 to 30 dB). If your child temporarily loses hearing before age 2, it can interfere with normal speech development. Although the fluid will probably clear in 1 to 2 months, help your child deal with limited hearing. Keep in mind that most children's speech will catch up following a brief period of incomplete hearing.

When you talk with your child:

Get close to your child, get eye contact, and get his full attention. Occasionally check that he understands what you have said.

Speak in a louder voice than you normally use. A common mistake is to assume your child is ignoring you when actually he doesn't hear you.

Reduce any background noise from radio or television while talking with your child.

If your child goes to school, be sure he sits in front near the teacher. Middle ear fluid interferes with the ability to hear in a crowd or classroom.

## 2.Restrictions

Your child doesn't have any restrictions because of ear fluid. Your child can go outside and does not need to cover the ears. Swimming is permitted unless there is a perforation (tear) in the eardrum, ear tubes, 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.

## 3.Medicines

Your child doesn't need any medicines unless he has allergies or an ear infection.

## 4.Ear recheck

Your child needs to be checked again to be sure the ear fluid doesn't last longer than 3 months and that it doesn't affect speech development.

How can I help prevent ear infections?

As long as there is fluid in the middle ear, your child is at risk for having another ear infection. The following list includes ways to help prevent getting ear infections.

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

- Avoid excessive colds. Reduce your child's exposure to children with 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. 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-degree 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 a continuously runny nose, consider allergy as a contributing factor to the ear infections. If your child has other allergies such as eczema, your physician will check for a milk protein or soy protein allergy.

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

## VENTILATION TUBE SURGERY:

What are ventilation/ear Tubes?

Ventilation/ear tubes are tiny plastic tubes that are surgically inserted through the ear drum (tympanic membrane) by an ENT surgeon to allow air into the middle ear. They also may be called tympanostomy tubes, myringotomy tubes, ventilation tubes, or PE (pressure equalization) tubes. Ventilation tubes drain fluid out of the middle ear space and ventilate the area with air.

These tubes can be made out of plastic, metal, or Teflon and may have a coating intended to reduce the possibility of infection. There are two basic types of ear tubes: short-term and long-term. Short-term tubes are smaller and typically stay in place for six months to a year before falling out on their own. Long-term tubes are larger and have flanges that secure them in place for a longer period of time. Long-term tubes may fall out on their own, but removal by an otolaryngologist is often necessary.

Who needs ear tubes and why?

Ear tubes are often recommended when a person experiences repeated middle ear infection (acute otitis media) or has hearing loss caused by the persistent presence of middle ear fluid (otitis media with effusion). These conditions most commonly occur in children, but can also be present in teens and adults and can lead to speech and balance problems, hearing loss, or changes in the structure of the ear drum. Other less common conditions that may warrant the placement of ear tubes are malformation of the ear drum or Eustachian tube, Down Syndrome, cleft palate, and barotrauma (injury to the middle ear caused by a reduction of air pressure), usually seen with altitude changes such as flying and scuba diving.

Each year, more than half a million ear tube surgeries are performed on children, making it the most common childhood surgery performed with anesthesia. The average age of ear tube insertion is one to three years old. Inserting ear tubes may:

- reduce the risk of future ear infection,
- restore hearing loss caused by middle ear fluid,
- improve speech problems and balance problems, and
- improve behavior and sleep problems caused by chronic ear infections.

Care of a Child After Ventilation Tubes:

The ear drum normally vibrates with sound because the space behind it is filled with air. If the middle ear is filled with fluid, as occurs during an ear infection, hearing is muffled.

Sometimes after an ear is no longer infected, fluid remains in the ear. This occurs if the Eustachian tube, which runs from the back of nose to the middle ear, becomes blocked and no longer allows air in and fluid out.

Approximately 30% of children still have fluid in the middle ear 1 month after an ear infection. 20% still have fluid 2 months after the infection, and 5% have fluid 4 months after the infection. Fluid is especially likely to stay in the ear if the first infection occurs before a child is 6 months old. By the time a child is 5 years old, the Eustachian tube is wider and fluid usually doesn't stay long after ear infections are treated.

The main concern about having fluid in the middle ear for a long time is that the muffled hearing may affect a child's speech development.

What are the benefits of ventilation tubes?

Ventilation tubes allow secretions to drain out of the middle ear space and allow air to reenter. The risk of recurring ear infections is greatly reduced. Hearing returns to normal with the tube in place and speech development can get back on track.

Ventilation tubes also prevent the fluid from becoming thicker ( "glue ear") and damaging the middle ear. Ventilation tubes give time for the Eustachian tubes to begin to function better as the child grows older.

How are ear tubes inserted in the ear?

Ear tubes are inserted through a day care surgical procedure called a myringotomy. A myringotomy refers to an incision (a hole) in the ear drum or tympanic membrane. This is most often done under a surgical microscope with a small scalpel (tiny knife), but it can also be accomplished with a laser. If an ear tube is not inserted, the hole would heal and close within a few days. To prevent this, an ear tube is placed in the hole to keep it open and allow air to reach the middle ear space (ventilation).

What happens during surgery?

A light general anesthetic (laughing gas) is administered for young children. Some older children and adults may be able to tolerate the procedure without anesthetic. A myringotomy is performed and the

fluid behind the ear drum (in the middle ear space) is suctioned out. The ear tube is then placed in the hole. Ear drops may be administered after the ear tube is placed and may be necessary for a few days. The procedure usually lasts less than 15 minutes and patients awaken quickly.

Sometimes the otolaryngologist will recommend removal of the adenoid tissue (lymph tissue located in the upper airway behind the nose) when ear tubes are placed. This is often considered when a repeat tube insertion is necessary. Current research indicates that removing adenoid tissue concurrent with placement of ear tubes can reduce the risk of recurrent ear infection and the need for repeat surgery.

### What to expect after surgery

After surgery, the patient is monitored in the recovery room and will usually go home within 4 hours if no complications are present. There is usually an initial fussy period of approximately 30 minutes following placement of tubes. Much of this is due to the initial confusion and disorientation of waking up after anesthesia. This should quickly pass and is commonly followed by a sleepy period. Your child should return to a normal routine later in the day but may continue to have periods of irritability. Patients usually experience little or no postoperative pain but nausea from the anesthesia can occur temporarily.

Hearing loss caused by the presence of middle ear fluid is immediately resolved by surgery. Sometimes children can hear so much better that they complain that normal sounds seem too loud.

The ENT surgeon will provide specific postoperative instructions for each patient including when to seek immediate attention and follow-up appointments. He or she may also prescribe antibiotic ear drops for a few days.

Drainage from the ears may occur for a few days after surgery especially with the use of antibiotic ear drops. It may appear clear, pink, or blood-tinged. At some point during the time your child has tubes, you may see additional drainage of fluid from the ears. This is most common during a viral illness. Antibiotic ear drops may be used alone to help clear this drainage.

To avoid the possibility of bacteria entering the middle ear through the ventilation tube, physicians may recommend keeping ears dry by using ear plugs or other water-tight devices during bathing, swimming, and water activities. However, recent research suggests that protecting the ear may not be necessary, except when diving or engaging in water activities in unclean water such as lakes and rivers. Parents should consult with the treating physician about ear protection after surgery. You may choose to place a dry cotton ball in the outer ear to absorb the drainage. Ear plugs during bath and shampoo time are not necessary. Plugs are, however, recommended for immersion in lake or ocean water.

Medication:

·Pain Medicine. Most children are back to normal a few hours after surgery and don't have any pain. If your child is fussy or runs a fever after surgery, give acetaminophen every 4 hours according to the directions for your child's age.

·Diet. Your child may feel sick to his stomach or throw up right after surgery. First give your child cool, clear liquids to drink. As your child feels like eating, slowly return to a normal diet.

·Ear Drainage after Surgery. Because an opening in the eardrum has been made, you may see drainage from the middle ear for 2 to 3 days after the operation. The drainage may be clear pink or bloody. The doctor may give you some medicine drops for this.

·Protection from Water. After the ear tubes are in place, try to keep water out of the ears. Often there won't be a problem if water does get in the ears, but water can carry germs into the middle ear through the tube and cause an ear infection. During bathing, shampooing, and swimming, your child's ears should be protected. Vaseline coated cotton balls, silicone ear putty, or specially made ear molds can be placed in the outer ear to block the ear canal. Silly Putty should not be used because pieces can be left in the ear canal. Either ear putty or ear molds should be used when swimming. No diving.

After surgery, you may or may not need to use antibiotic drops in your child's ear. If drops are used, please follow the recommendation on your prescription.

When to Call the Doctor:

- If your child develops a fever over 101°.
- If there is a steady trickle of blood or if drainage continues beyond one week despite the use of antibiotic ear drops.

Tube Removal

PE tubes do not need to be surgically removed. PE tubes are slowly pushed out of the eardrums and fall out of the ear. This usually happens 6 to 12 months after surgery. Most children (85%) will not need a second set of PE tubes put in. By the time the tubes have fallen out, most children have outgrown the need for tubes. Painful ear infection is most common in children – by the age of five, nearly every child has experienced at least one episode. Most ear infections either resolve on their own (viral) or are effectively treated by antibiotics (bacterial). But sometimes, ear infections and/or fluid in the middle ear may become a chronic problem leading to other issues such as hearing loss, behavior, and speech

problems. In these cases, insertion of an ear tube by an ear, nose, and throat surgeon may be considered.

#### Possible complications

Myringotomy with insertion of ear tubes is an extremely common and safe procedure with minimal complications. When complications do occur, they may include:

- Perforation – This can happen when a tube comes out or a long-term tube is removed and the hole in the tympanic membrane (ear drum) does not close. The hole can be patched through a minor surgical procedure called a tympanoplasty or myringoplasty.
- Scarring – Any irritation of the ear drum (recurrent ear infections), including repeated insertion of ear tubes, can cause scarring called tympanosclerosis or myringosclerosis. In most cases, this causes no problems with hearing.
- Infection – Ear infections can still occur in the middle ear or around the ear tube. However, these infections are usually less frequent, result in less hearing loss, and are easier to treat – often only with ear drops. Sometimes an oral antibiotic is still needed.
- Ear tubes come out too early or stay in too long – If an ear tube expels from the ear drum too soon (which is unpredictable), fluid may return and repeat surgery may be needed. Ear tubes that remain too long may result in perforation or may require removal by the ENT surgeon.