

EARDRUM TUBE PLACEMENT (TYMPANOSTOMY)



Your child has been bothered by persistent or recurrent middle ear problems. Instead of continued medical therapy, consideration at some point can be given to the surgical option of placing ventilation tubes in your child's eardrums. These are answers to common questions regarding this procedure.

What is the purpose of eardrum ventilation tubes?

The middle ear is an air-filled cavity separated from the ear canal by the paper-thin eardrum. The eustachian tube is a passageway that connects the middle ear to the back of the nose. The eustachian tube allows air to go into and fluid to drain out of the middle ear space. If the eustachian tube is not working well, then middle ear problems can develop which may ultimately warrant placement of eardrum ventilation tubes.

The operation consists of making a slit in the eardrum, suctioning out any fluid in the middle ear space and then placing a small plastic tube into the eardrum (not into the eustachian tube).

By having a tube in the eardrum, air can now freely pass into the middle ear, and any middle ear fluid can drain out through the tube and out of the ear canal. Usually after 6 to 12 months, the tube works its way out of the eardrum and the hole in the eardrum closes. Hopefully, once the plastic tube comes out, your child's own eustachian tube is functioning well enough that the middle ear problems do not recur.

At what point is it appropriate to have this procedure done?

1. *Excessive Pain and Suffering from Recurrent Middle Ear Infections.* Determining whether your child's infections are significant enough to warrant tube placement depends on the frequency of those infections, the severity of the symptoms with each infection and the response of those symptoms to antibiotics. In other words, are the infections significantly impacting your child's quality of life?

Another issue to consider is the likelihood of continued infections.

Risk factors suggesting that the infections will likely continue include:

- child's age being less than 2-3 years old
- being in the middle of an unfavorable season (winter/spring)
- infections continuing through a favorable season (summer/fall)
- infections continuing while on preventative/maintenance antibiotics
- child's first infection before 6 months of age
- family history of middle ear problems
- being in a large daycare class
- middle ear fluid persisting between infections

2. *Persisting Hearing Loss from Middle Ear Fluid.* In addition to contributing to recurrent infections, the persisting middle ear fluid can cause a temporary hearing loss which could lead to speech and language problems. As such, even if your child has not had any infections, tubes are usually recommended if middle ear fluid persists in both ears for more than three months and is documented to be causing a hearing loss.

3. *Severe Eardrum Retraction.* Even without any infections or fluid, the eardrum of some children gets stretched out of position due to their middle ear problems. Tubes are recommended when repeat exams of the ear suggest that permanent damage to the eardrum or hearing bones may occur if the process continues.

What are the limitations of eardrum ventilation tubes?

1. *Repeat Tube Placement.* The plastic tube in the eardrum does nothing to make the eustachian tube function better. If your child's eustachian tube is not functioning well by the time the plastic tube comes out of the eardrum, then the middle ear problems can recur requiring a second set of tubes. Overall, 20% of children end up needing a second set of ventilation tubes.

2. *Continued Infections.* Ventilation tubes do not necessarily eliminate all middle ear infections. More than twenty percent of children, especially infants whose own immune systems are still immature, continue to get ear infections even with tubes in place. Fortunately, the frequency and severity of those infections tend to be less for most, but not all, children.

3. *Eardrum Perforation.* In one to two percent of cases, the tube works its way out of the eardrum, but the hole where it was does not close. This perforation in the eardrum can be repaired but requires additional surgery.

4. *Retained Tube.* There is no guarantee how long the tube will remain in place. The tube, on rare occasions, comes out after just a few months. On the other hand, another unlikely possibility is that the tube might be retained in the eardrum longer than desired. If the tube has been in place for 2 years or longer, the decision may be made to go back to the operating room to remove it.

5. *Plugging of Tube.* Thick mucus from the middle ear may occasionally plug the tiny opening of the tube. Fortunately, this problem can usually be corrected in the office.

6. *Anesthetic Risk.* There are risks anytime anesthesia is used. Fortunately, with all the high tech monitoring equipment currently available, that risk is exceptionally low, even in the youngest of healthy children getting tubes.

Will my child have to wear earplugs when he/she is around water?

After tube placement, only limited precautions are needed when these children are around water. Children with tubes should avoid diving head first into a swimming pool, avoid going deeper than three feet underneath the water in a pool and avoid submerging their head in a bathtub filled with soapy water. The use of plugs or cotton in the ears is of no benefit and not necessary.

What are the risks of not having the surgery?

1. *Pain.* Middle ear infections are painful. While most children will eventually outgrow the infections, their quality of life (and the parents') can be significantly affected until that time.

2. *Resistant Bacteria.* The multiple courses of antibiotics used to treat middle ear infections can lead to the development of resistant bacteria. Treating infections caused by these resistant bacteria can be difficult even with the best available antibiotics.

3. *Speech Delay.* Middle ear fluid usually causes a partial hearing loss. While the hearing loss exists only as long as the fluid is present, even that temporary hearing loss can lead to speech and language delay or to school and social problems.

4. *Eardrum and Hearing Bone Damage.* Middle ear problems sometimes lead to the eardrum being excessively pulled out of its normal position. That eardrum retraction can, on rare occasions, lead to permanent eardrum and hearing bone damage requiring delicate reconstructive surgery.

5. *Inner Ear Damage.* Although rare, middle ear infections can spread into the inner ear and cause permanent hearing and/or balance problems. Equally rare, middle ear infections can spread into the brain or bloodstream.

What are standard alternative treatment options?

1. *Watchful Waiting.* Infants will often outgrow the recurrent infections around the age of 2.5 to 3 years old. As such, each individual infection can be treated with antibiotics until the child, hopefully, outgrows the problem.

2. *Preventative (Maintenance) Antibiotics.* The daily use of antibiotics at a lower than usual dose can possibly decrease the frequency of infections. Unfortunately, they increase the frequency of developing resistant bacteria.

3. *Allergy Treatment/Adenoidectomy.* In some children, especially children over 3 years old, treating any underlying nasal allergies may correct the middle ear problem. Removing the adenoids is another alternative in these children.

We welcome any questions you have about these issues.

INDICATIONS FOR EARDRUM TUBE PLACEMENT SUMMARY

The reasons for placing eardrum ventilation tubes vary depending on the type of middle ear problem a child has. Listed below are the factors that should be considered for each specific middle ear disorder. A child often has more than one middle ear problem, so more than one reason may exist for inserting tubes. In many cases, tubes are not an absolute must. Instead, “to tube” or “not to tube” are both reasonable options.

1. Long-standing middle ear fluid (i.e. chronic OME) present continuously in both ears for more than three months with
 - associated hearing loss
 - underlying speech delay
 - negative impact on school performance or social interactions

2. Recurrent symptomatic ear infections (i.e. recurrent AOM) having both
 - a. a negative impact on quality of life
 - frequent infections
 - moderate or severe degree of symptoms
 - slow or poor improvement in symptoms with antibiotics
 - multiple antibiotic allergies or other difficulty taking antibiotics

 - b. high likelihood of infections continuing
 - under 2.5 to 3.0 years old
 - currently in an unfavorable season (September - April)
 - continuation of infections during this or past summer
 - failure of preventative antibiotics
 - onset of infections before 6 months of age
 - family history of middle ear problems.
 - middle ear fluid persisting between infections

3. Eardrum developing permanent damage (i.e. worrisome retraction)
 - seen on exam

4. Indications for removal of adenoids at same time
 - current age over 3 years old
 - getting second set of tubes
 - constant nasal obstruction
 - obstructive breathing during sleep
 - constant or frequent nasal and sinus infections
 - that are more than simple colds, and
 - that are impacting child's quality of life