Carolina Ear, Nose & Throat
Head and Neck Surgery Center

Painful ear infections are a rite of passage for 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 otolaryngologist (ear, nose, and throat surgeon) may be considered.

What are ear tubes?
Ear tubes are tiny cylinders placed through the ear drum (tympanic membrane) to allow air into the middle ear. They also may be called tympanostomy tubes, myringotomy tubes, ventilation tubes, or PE (pressure equalization) tubes. 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.

How are ear tubes inserted in the ear?
Ear tubes are inserted through an outpatient 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 an hour if no complications are present. Patients usually experience little or no postoperative pain but grogginess, irritability, and/or 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 otolaryngologist 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.

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.

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 in-sertion 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. How-ever, 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 otolaryngologist.