

# Patient Guide

## Chronic Ear Disease



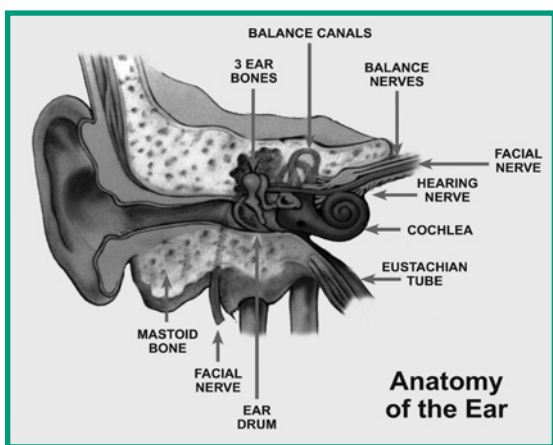
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# Chronic Ear Disease

Chronic otitis media is a defect of the ear drum, middle ear or mastoid bone, caused by infection. Symptoms depend upon a number of factors such as whether the infection is active or inactive, whether there is a cyst of skin (cholesteatoma) present, how much the mastoid bone is involved, and whether or not there is currently a hole in the eardrum. There may be drainage, hearing loss, tinnitus (noise in the ears or head), dizziness, pain, or rarely, weakness of the face.



## Function of the Normal Ear

The ear is divided into three parts: the external ear, the middle ear, and the inner ear. Each part performs an important function in the process of hearing.

Sound waves pass through the canal of the external ear and vibrate the eardrum, which separates the external from the middle ear. There are three small bones in the middle ear that act as an amplifier to transmit energy of the sound vibrations to the fluids of the inner ear. These hearing bones are called ossicles and consist of the hammer (malleus), anvil (incus), and stirrup (stapes). The vibrations produced by

the eardrum and chain of ossicles are transmitted to the inner ear fluids where these movements stimulate delicate nerve fibers. The hearing nerve then transmits impulses to the brain where they are interpreted as understandable sound.

## Types of Hearing Impairment

The external ear and the middle ear conduct sound; the inner ear receives it and converts it to a nerve impulse. If there is some difficulty in the external or middle ear, a conductive hearing loss occurs. If the trouble lies in the inner ear, a sensorineural or "nerve" hearing loss is the result. When there is difficulty in both the middle and inner ear, a mixed hearing loss is present. The conductive portion of the hearing loss is caused by the chronic ear infection and is theoretically correctable. The success in surgical correction of hearing loss depends upon many factors including the extent of prior bone destruction, the degree of infection present, the amount of scarring that has occurred and the nature of the healing process in the ear after surgery.

## The Diseased Middle Ear

Any disease affecting the eardrum on the three small hearing bones may cause a conductive hearing loss by interfering with the conduction of sound to the inner ear. Such a hearing impairment may be due to a perforation (hole) in the eardrum, partial or total destruction of the three ear bones, or scar tissue.

When an acute infection develops in the middle ear, the eardrum may rupture resulting in a perforation. If this perforation fails to heal, a hearing loss may occur. Sometimes this is associated with tinnitus and/or drainage from the ear. Even ears that never had a perforation can develop chronic otitis media due to repeated acute ear infections or eustachian tube problems, usually during

childhood. These conditions can weaken the eardrum, resulting in deep pits (retraction pockets) that retain skin debris and become infected. They may also erode the tiny hearing bones or progress to form a cholesteatoma (skin-lined cyst in the air containing spaces of the middle ear or temporal bone).

## Care of the Ear

If a perforation is present, water should not be allowed to get into the ear canal. This may be avoided when showering or washing the hair by placing cotton or lambs wool saturated with Vaseline in the external ear canal. Before swimming, use appropriately fit ear plugs and possibly, an additional tight-fitting cap or swim band. An alternative would be custom made ear plugs that can be fit by an audiologist.

Avoid blowing the nose forcefully to prevent any infection in the nose from spreading to the ear through the eustachian tube. If cleaning the nasal cavity is absolutely necessary, do not occlude or compress one nostril while blowing the other.

In the event of ear drainage, the outer portion of the ear canal should be kept clean by means of a cotton tipped applicator (Q-Tip). Medication should be used if prescribed when drainage occurs. Cotton may be placed in the outer ear to catch any discharge but should not block the ear canal completely.

## Medical Treatment

Medical treatment frequently will stop ear drainage. Treatment consists of careful cleaning of the ear and, at times, the application of antibiotic powder or ear drops. Antibiotics by mouth may be helpful in certain cases.

# Findings in Your Case

Hearing is measured in decibels (dB).  
A hearing level of 0 to 25 dB is considered normal for conversational purposes.

## Our hearing tests reveal your hearing level to be:

Right Ear \_\_\_\_\_ decibels  
Left Ear \_\_\_\_\_ decibels

### (Conversion to degree of impairment)

25dB	.....0%	..... 55 dB(Moderate)	.....45%
30dB(Mild)	.....5%	..... 65dB(Severe)	.....60%
35dB(Mild)	.....10%	... 75dB(Severe)	.....75%
45dB(Moderate)	..30%	... 85dB(Severe)	.....100%

## Examination of your ear reveals:

- ☐ Your ear problem does not require surgery
- ☐ Severe scarring of the eardrum and middle ear
- ☐ A perforation of the eardrum
- ☐ A significant retraction pocket in the eardrum
- ☐ Active drainage from the middle ear and/or mastoid
- ☐ A cholesteatoma (skin lined cyst) in the middle ear or mastoid bone
- ☐ Partial or total destruction of one or more of the middle ear bones
- ☐ A mastoid cavity from prior surgery

## You are a satisfactory candidate for a:

- ☐ Tympanoplasty operation (repair of the eardrum and middle ear bones)
- ☐ Tympanoplasty with mastoidectomy (eradication of disease in the mastoid and middle ear, repair of the eardrum and middle ear bones)
- ☐ Tympanoplasty: planned second stage
- ☐ Tympanoplasty with revision mastoidectomy
- ☐ Radical mastoid operation
- ☐ Mastoid obliteration operation

# Surgical Treatment

For many years, surgical treatment of chronic otitis media was used primarily to control infection and prevent serious complications. More recently, improvements in surgical techniques have made it possible to also reconstruct the diseased hearing mechanism in many cases.

## Description of Ear Operations

### **Tympanoplasty**

Tympanoplasty is the operation performed for the purpose of repairing the eardrum and middle ear structures. This procedure seals the middle ear and improves the hearing in many cases. Since chronic infection may also damage the three hearing bones that transmit sound from the eardrum to the inner ear and hearing nerve, a tympanoplasty sometimes requires the repair of the hearing bones, which is the sound transmitting mechanism, along with the perforation in the eardrum. Surgery may be performed through the ear canal or from behind the ear.

Tissue grafts of various sorts are used to replace or repair the eardrum. These include fat or soft tissue, the covering of the muscle from above the ear (fascia), the lining of the temporal bone (periosteum) the covering of ear cartilage (perichondrium), with the cartilage or eardrum transplants (homografts). A diseased hearing bone may be repositioned to connect the eardrum to the inner ear or it may be replaced by a synthetic prosthesis. Cartilage and artificial bone, or metal alloys such as titanium are used at times to substitute for a missing hearing bone. A thin piece of silastic sheeting is frequently placed behind the eardrum which helps to prevent scar tissue from forming, allowing normal aeration function of the middle ear and motion of the eardrum.

When the ear is filled with scar tissue, or when all hearing bones have been destroyed, it may be necessary to perform the operation in two stages. In these cases the eardrum is repaired first, then several months later the sound transmitting mechanism is reconstructed.

Surgery is often performed as an outpatient or the patient may be hospitalized overnight following surgery. One may return to work in a week to ten days. Healing is usually complete in six to twelve weeks. Hearing improvement may not be noted for several weeks until all the fluids clear from the middle ear and the healing is complete.

### **Tympanoplasty With Mastoidectomy**

Active infection may in some cases stimulate skin of the eardrum or canal to grow through a perforated eardrum into the middle ear and mastoid. When this occurs, a skin-lined cyst known as cholesteatoma is formed. This cyst may continue to expand over a period of years and destroy the surrounding bone. If a cholesteatoma is present, the drainage tends to be more constant and frequently has a foul odor. In many cases the persistent drainage is due to chronic infection in the bone surrounding the ear structures.

Once a cholesteatoma has developed or the mastoid bone has become infected, it is rarely possible to eliminate the infection by medical treatment. Antibiotics placed in the ear or taken by mouth only result in a temporary improvement in most cases. Recurrence is frequent after treatment is stopped.

A cholesteatoma or chronic ear infection may persist for many years without serious difficulty except for the annoying drainage and hearing loss. It may however, by local expansion and pressure, involve important surrounding

structures. If this occurs, the patient will often notice a fullness or a low-grade aching discomfort in the ear. Dizziness or weakness of the face may develop. If any of these symptoms occur, it is imperative that one seek immediate medical care. Surgery may be necessary to eradicate the infection and prevent serious complications.

When the destruction by cholesteatoma or infection is widespread in the mastoid, the surgical elimination of this may be difficult. Surgery is performed through an incision behind the ear. The primary objective is to eliminate infection and obtain a dry, safe ear.

In many patients with cholesteatoma, it is not possible to eliminate infection and restore hearing in one operation. The infection is eliminated and the eardrum rebuilt in the first operation. This requires a general anesthetic often with hospitalization overnight. The patient may usually return to work in one to two weeks.

When a second operation is necessary, it will be performed to restore the hearing mechanism and to reinspect the ear spaces for any residual (remaining) cholesteatoma.

Sometimes an open mastoid cavity must be created to control infection deep in the mastoid bone and to prevent recurrence of the cholesteatoma. This is accomplished by exposing the contents of the mastoid bone to the outer ear canal and then enlarging the opening into the ear canal. It may take up to four months for the cavity to heal properly, and occasional cleaning of the cavity is required throughout the patient's lifetime.

### **Tympanoplasty: Planned Second Stage**

The purpose of this operation is to reinspect the ear spaces for disease and to improve the hearing. This is typically performed 6 to 12 months



after the original operation. Surgery may be performed through the ear canal or general anesthesia. The ear is inspected for any persistent infection or cholesteatoma. Sound transmission to the inner ear is restored by replacing missing ear bones with bone, cartilage, artificial synthetic ossicles, or a combination of these materials.

### **Tympanoplasty with Revision Mastoidectomy**

The purpose of this operation is to eliminate drainage from a previously created mastoid cavity. An effort is also made to improve hearing, depending upon the status of the ear. The operation is performed under general anesthesia through an incision behind the ear. Diseased tissue is removed from the mastoid cavity, and efforts are made to minimize the depth of the cavity and create an adequate ear canal opening for observation and cleaning of the cavity. The eardrum is repaired and, if possible the hearing mechanism is restored. Sometimes, a second operation is necessary to obtain hearing improvement (see Tympanoplasty: Planned Second Stage). Complete healing of the cavity and the middle ear may take up to four months.

### **Radical Mastoid Operation**

The purpose of this operation is to eradicate the infection without attempting to restore hearing. It is usually performed for those patients who have very advanced or persistent infections. Occasionally it is necessary to perform a radical mastoid operation in a case that originally appeared suitable for a tympanoplasty. This decision is made at the time of surgery.

The radical mastoid operation is performed under general anesthesia and requires removal of the eardrum and the hearing bones to reliably eliminate all the disease in the middle ear and mastoid. The opening into the ear canal is

enlarged to facilitate observation and cleaning of the resulting cavity. Usually the patient may return to work in one to two weeks. Complete healing may require up to four months.

### **Mastoid Obliteration Operation**

The purpose of this operation is to remove any mastoid infection and to obliterate a previously created mastoid cavity. Hearing improvement is rarely possible. The mastoid cavity may be filled with fibrous tissue or muscle. If the disease has been completely removed, the surgeon will sometimes elect to sew the ear canal shut, so that the drainage and infection will not return. The operation is performed under general anesthesia through an incision behind the ear. Usually the patient may return to work in one to two weeks. Complete healing may require up to four months.

## **Potential Benefits from Surgery**

**Drainage:** Eardrum grafting is successful in over 90% of patients resulting in a healed ear that does not drain.

**Hearing:** Hearing improvement following surgery depends upon many factors, such as the extent of the damage to the ear bones and the healing ability of the ear. It is uncommon to have total restoration of hearing. You have approximately \_\_\_\_\_ out of ten chances that surgery will be effective in improving your hearing.

In your case two operations will be necessary in all likelihood in order to improve the hearing. In this case your hearing may be worse in the operated ear between operations.

## **What to Expect Following Surgery**

There are certain symptoms which may follow your ear operation. These are normal and do not represent a complication or problem that should concern you.

## **Temporary Hearing Loss**

After every ear operation, the ear is filled with packing and fluids that are a normal part of the healing process. These factors interfere with normal hearing for up to several weeks. No judgment about the success of an operation can be made until the ear has healed and cleared these fluids.

In some cases, a two stage operation is necessary to obtain satisfactory hearing and to eliminate the disease. The hearing is often worse than before surgery in these instances, but the second operation may restore or even improve the hearing.

## **Taste Disturbance**

Taste disturbance is not uncommon for a few weeks following surgery. It usually is described as a metallic taste on the side of the tongue, and can decrease the ability to appreciate sweet, salty, bitter, and sour tastes on that side. This results from irritation of a taste nerve that travels between the eardrum and the hearing bones. Usually it is not noticed longer than one month after surgery. In 5% of patients, this disturbance is prolonged.

## **Tinnitus**

Tinnitus (noise in the ear or head), is frequently present before surgery when there is a hearing loss. Some noises in the ear are almost always present temporarily after surgery. These may include gurgling, popping, humming, buzzing or ringing sounds. These may persist for one to two months and then decrease in proportion to the hearing being unimproved or worse, the tinnitus may persist or be worse.

## **Numbness of Ear**

Temporary loss of skin sensation in and around the ear is common following surgery because of the incision. This numbness may involve the entire outer ear and may last for six months or more.

## **Jaw Symptoms**

The jaw joint is in intimate contact with the ear canal. Some soreness or stiffness in the jaw movement is very common after ear surgery. It usually subsides within one to two months.

# Risks and Complications of Surgery

Any operation can be complicated by bleeding or infection in the tissues immediately after surgery. Fortunately, serious complications that are unique to ear operations are uncommon following surgery for chronic ear infection. Some of the important potential complications that you should consider before submitting to ear surgery are:

## **Perforation of the Eardrum**

Even when the proper repair techniques are used, up to 10% of patients will develop a new perforation of the eardrum during the first year after surgery. This may be due to poor healing or recurrent infection. Often another operation is required.

## **Ear Infection**

Ear infection with drainage and pain may recur following surgery. Additional surgery or medical treatment might be necessary to control the infection.

## **Loss of Hearing**

The primary goal of surgery in cases of chronic otitis media is to control infection and prevent future infection. We hope to obtain or maintain useful hearing in all cases, but this is not always possible.

In some ear operations, the hearing is further impaired permanently due to the extent of the disease present or due to complications in the healing process. In one percent of cases the hearing is completely lost and nothing further can be done to restore useful hearing in that ear, even with use of a hearing aid.

## **Dizziness**

Mild unsteadiness is common after ear surgery due to irritation of the inner ear structures. Severe dizziness (vertigo) occurs rarely, and sometimes accompanies severe hearing loss. On rare occasions, this dizziness is quite prolonged. If so, an operation designed to relieve the vertigo can be considered.

Some of the patients with chronic ear infection due to cholesteatoma have a labyrinthine fistula, which is an abnormal opening into the one of the balance canals. When this problem is encountered, the risk of dizziness increases and may last for six months or more.

## **Facial Paralysis**

An uncommon postoperative complication of ear surgery is temporary paralysis of one side of the face. The facial nerve travels through the skull in close association with the middle ear and the mastoid. Usually the nerve is covered by bone. If the nerve is not in its usual position or has been invaded by disease, it is at risk for injury during surgery. Simple swelling of the nerve causes a temporary paralysis that usually subsides spontaneously with good recovery of facial function. On very rare occasions, the nerve itself may be injured at the time of surgery or it may have to be removed in order to eliminate disease. When this happens, a skin sensation nerve is removed from the upper part of the neck to replace the facial nerve. Paralysis of the face under these circumstances would be complete for six months to a year, followed by partial recovery and some permanent weakness. Eye complications can develop requiring treatment by a specialist.

## Complications Related to Mastoidectomy

Each of the above complications is slightly more common in cases requiring mastoid surgery.

There are some additional possible complications about which you should be aware:

Perichondritis is a serious infection in the lining of the outer ear cartilage that sometimes develops after mastoid surgery. Hospitalization or a second operation may be required to control the infection.

A leak of fluid surrounding the brain (cerebrospinal fluid) is a very rare complication of ear surgery. A second operation may be necessary to stop the leak.

Meningitis and brain abscesses were common in cases of chronic otitis media prior to the availability of antibiotics and modern surgical techniques. These complications almost never occur today, and in fact, are more likely to develop if surgery is not performed to remove the infection.

## Complications Related to Anesthesia

Anesthetic complications are very rare, but can be serious or life-threatening. You should discuss your concerns with the anesthesiologist before surgery, particularly if you have had difficulty with a prior general anesthetic.

## Travel Restrictions following Surgery

You should have someone drive you from the hospital. Air travel is permissible 48 hours after surgery if required.

## General Comments

If you do not have surgery performed at this time, it is advisable to have regular examinations, especially if the ear is draining. Should you develop constant dull pain in the ear, increased discharge, dizziness, or weakness of the face, you should immediately consult your physician.

## Our Office Locations

With a variety of office and clinic locations throughout the region, we are here to meet your needs.

### Dupont Office

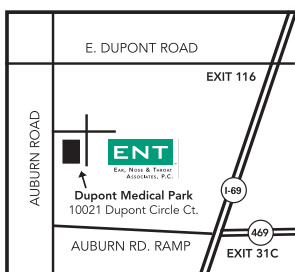
(CT Scanner location)  
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### Lutheran Medical Park

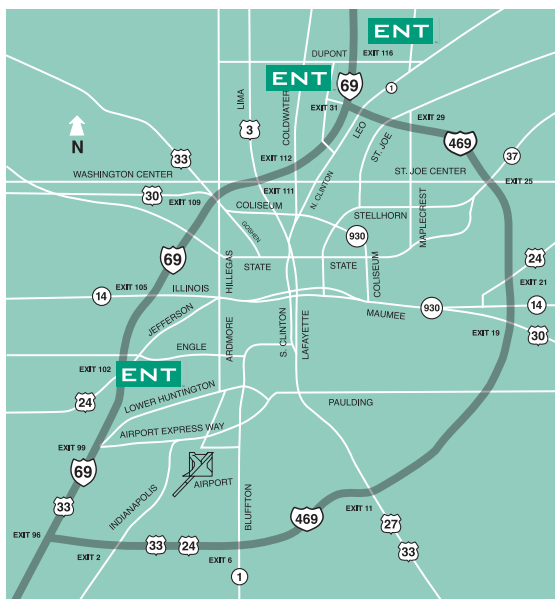
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Ear, Nose and Throat Associates, P.C., is a medical practice of board-certified physicians and surgeons specializing in otolaryngology medical care and surgery. Whether we are treating children or adults, our approach is one of care and concern for the patient. Our staff of licensed clinicians and experienced office professionals are committed to you and your health.



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