

Hearing Loss & Hearing Aids

A Guide to Better Hearing



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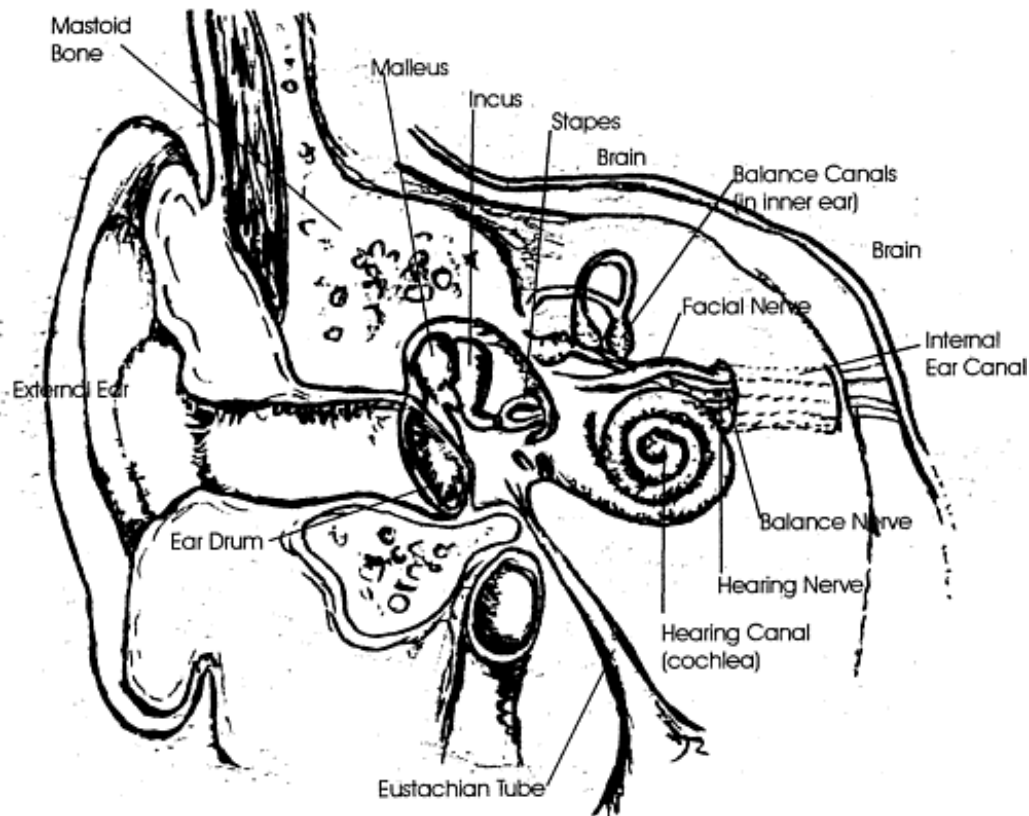
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HEARING LOSS

How the Ear Works

Sound waves are gathered and funneled into the ear canal by the pinna toward the eardrum. The vibrations of the eardrum are transmitted through the three bones in the middle ear, malleus (hammer), incus (anvil), and stapes (stirrup) to the cochlea or inner ear. The stapes vibration causes fluid within the cochlea to move stimulating the release of electrical energy from tiny nerve endings called hair cells. These signals travel to the brain and we perceive sound.

Hearing Loss

As can be deduced from the discussion of the function of the normal ear, there are several problems that can result in hearing loss. These problems are generally divided into two types. A conductive hearing loss is a problem with the conduction of sound from the outside to the inner ear. A sensori-neural hearing loss is due to a disturbance of the nerve endings in the inner ear itself or in the hearing nerve. A mixed hearing loss consists of hearing loss from both a conductive component and a sensori-neural component.

Depending on the type of hearing loss that you have, surgery or a hearing aid may be recommended to correct your hearing loss. In circumstances of extreme hearing loss, a cochlear implant may be recommended.

The Hearing Test

The hearing test consists of several different measurements. Each ear is measured in its ability to detect different frequencies, or “pitches” or tones, that the human ear is commonly exposed to. A volume is recorded for each tone and this is placed on a grid. In addition to these measurements, the ear’s ability to understand speech is measured. This measurement is taken by giving words presented at a sound level much greater than the ability to detect speech.

It is useful to use an old radio as an example. The first test to detect volume is much like turning the volume up and down on the radio. The second test to measure understanding is much like turning the dial to the frequency that the radio station broadcasts. The person will not hear very well if the speech understanding or discrimination score is low, no matter how high the volume is. This is much as if you turn a radio up very loud but it is off the station.

Types of Conductive Hearing Loss

The simplest form of conductive hearing loss is experienced by all. When one has gone swimming or takes a shower and has water in the ear, it produces a small conductive hearing loss which feels as if the ear is dull or plugged. This is quickly reversed when the water is gone. Conductive hearing loss also occurs when wax plugs the ear. Another form of conductive hearing loss occurs in persons who develop a fluid collection in the middle ear. Children often develop this problem. A disturbance in the conduction of the eardrum with the small ear bones can also cause hearing loss, but this can be corrected with surgery.

Types of Sensori-Neural Hearing Loss

There are many different things that can affect the inner ear and the hearing nerve. We all lose some of the hearing in the inner ear as we get older. This usually catches up to us in the speech range in our 60’s. This causes a high tone nerve hearing loss. Persons with a loss primarily in the high tones will have difficulty in hearing the consonant sounds. They will still hear the vowel sound well because these are low tones. The result is that it sounds as if people are mumbling when they talk. One hears every word that is spoken because every word contains a vowel sound. However, they miss the consonant sounds that give meaning to words. An example is related in the words ten, pin and in. A person with high tone nerve hearing loss may miss the “t” in ten or the “p” in pin, and each of these words sounds like “in”. Often, the person is able to put the word in context with what is being spoken and can figure out which consonant was used. For example, a person would not say, “I stuck him with a ten.” In this case, one could determine that the person meant “pin” even if all you heard was “in”. This type of hearing loss can be very confusing and lead to sore feelings. Your spouse may say “She hears what she wants to hear. I was across the room and she heard me”. In fact, you heard the vowel sound in the words (low tones) as well as he did. However, not hearing the consonant sounds (high tones) made his speech indecipherable. You may find yourself tired and irritable at the end of the day because you’ve been working hard to put this complicated puzzle together all day. It can even make one feel depressed and lead to reclusive behaviors.

Another type of nerve hearing loss is due to inner ear fluid imbalance known as cochlear hydrops. This can cause a fluctuating hearing loss with ringing in the ear. This is usually treated with a low

salt diet. Often, a fluid pill is given in treatment for this. Many patients who have this condition also notice problems with dizziness, as this problem also can affect the balance portion of the inner ear.

There are many types of nerve hearing loss that are inherited and passed from on from family to family. Sometimes, this hearing loss is associated with other inheritable abnormalities. Very rarely, about one in one hundred thousand persons will experience hearing loss in one ear due to a tumor growing on the hearing nerve. If it is felt there is enough degree of suspicion to warrant it, further tests may be needed to eliminate this as a possible cause of your hearing loss.

Hearing Loss In One Ear

Those with hearing loss in one ear get along very well in general. However, there are certain things that are very difficult for those that hear well in only one ear. Primarily, this person will have a very difficult time telling where sound is coming from. Sound travels at a relatively low speed, and sound coming from one side hits the closest ear a split second before it hits the other ear. The brain uses this difference in time to locate where sound is coming from. It also sounds louder in one ear than the other. This ability is lost when one hears in only one ear.

Hearing loss in one ear also causes difficulty hearing in situations with background noise. That same ability of the brain to determine sounds hitting one ear a little faster than the other allows us to use our two ears to focus on one sound out of a crowd of sounds. This is lost with hearing impairment in one ear.

Those with hearing loss in one ear should be very careful crossing a street, and check to make sure no cars are coming. In difficult listening situations, such as parties, they should position themselves such that their good ear is toward those they are speaking with and their bad ear is toward a wall, so that no one will come up on the other side and start talking to them, unaware of their hearing loss.

In some instances, the use of a CROS hearing aid is desirable. This stands for contralateral routing of signals. This hearing aid takes sound from one side and transmits it to the other ear via a radio signal. It is not useful for a lot of people. Those that work in situations with co-workers on either side are especially pleased with this device.

Another device that is helpful in unilateral hearing loss is a bone anchored hearing aid. These devices involve the implantation of a titanium screw in the skull and a processor on the outside that attaches directly or via a magnet couple. The sound waves are transmitted through the skull to the cochlea of the opposite ear. A headband that presses the processor onto the head can be demonstrated to give you a close simulation of how the actual process can work for you.

Recommendations For Friends and Relatives of Those With Hearing Loss

Get the person's attention before you speak.

It is very important to touch the person or make sure they are aware you are talking before you start your conversation. You definitely do not want to try to start a conversation from another room.

Speak at a normal volume and normal rate

It is distracting and confusing for a person with a hearing loss to have someone speak at a loud volume in an abnormal way and at a fast rate. Although you certainly want to speak up and make sure they do hear you, overly loud voices cause distortion and poor understanding. They will often think that they have turned their hearing aid up too loud and will try to adjust it and this will cause problems.

Place yourself in front of the person with your lips clearly visible

Those with hearing loss often use visual cues from the lips to help understand; therefore, it is very important that they can see you speaking. Along these lines, it is rude and problematic if you are chewing gum or eating while you try to speak. It is helpful for males to avoid mustaches and beards if they have a close family member that has a hearing impairment. The mustache and beard mask some of the lip movements that are helpful in understanding speech.

Try to carry on your conversation in a quiet room

Competing background noise makes hearing very difficult. We have all experienced this in restaurants and other busy places. This is especially difficult for those with hearing impairment.

Repeat the statement

Repeated statements of the same fact tend to reinforce a hearing-impaired person's perception of the conversation. It is better to repeat phrases using different words. An example would be as follows: "I want you to go to the store with me." This sentence could be rephrased as follows: "Let's go to the grocery." By repeating the same sentence using a different phrase and words, it might be easier for that person to understand. Repeating the same sentence louder might not be helpful.

Speech Reading

We all use facial expressions, lip movements, and gestures to help us understand speech. Those with hearing impairment rely on this to a greater extent. This is recognizable in watching a movie in which the sound is not coordinated with the action. We have all seen movies in which the actor's lip movements lagged behind the sound for a second. This is very annoying and distracting. The reason it is annoying and distracting is because we subconsciously rely on visual cues from the lips to help us understand speech.

This is why it is important for us to always get in front of another person that is speaking to us so we can see their lip movements. Let the person understand that it is important that we see them when we speak with them.

Nevertheless, speech reading has limitations. Obviously, on the telephone this is useless. Also, however, there are many sounds that "look" the same. About two-thirds of all the sounds in the

English language are not visible through lip reading.

It is also helpful to use inflections and pauses in speech for meaning. Placing emphasis on different words carries a totally different meaning in the conversation.

There are many ways to help develop your skills at speech reading, including watching television with the sound turned down very low to look for speech cues on the lips of the actors. Also, there are many books and videos available that teach lip reading.

HEARING AIDS

Hearing Aids are digital devices that amplify sound. They consist of a microphone that picks up surrounding sounds. An amplifier makes the sounds louder and a speaker that sends the sound into the ear. Technology has improved tremendously over the last few decades in hearing aid design. Many people are reluctant to try hearing aids based on the experiences of a friend or relative years ago. This should not be a discouraging factor. The hearing aids presently available are of much better quality than those in the past.

All hearing aids contain a computer within the hearing aid that changes the amplification continuously based on the incoming sound. This gives a much better quality of sound. Some of these devices employ digital technology allowing an even greater tailoring to your particular hearing loss. The newest technology is implantable bone conduction hearing aids or BAHA. These devices may be appropriate for individuals who have conductive type hearing loss or single sided deafness. Partially surgically implanted, these hearing aids conduct sound through the bone of the skull to the middle ear.

It is important that anyone you are dealing with concerning a hearing aid give you at least a one month trial period to use the hearing aid to see if it helps. At the end of the month, you should be able to return your hearing aid for a refund if it is not satisfactory. There is usually a minimal nonrefundable fitting fee involved. In addition, it is highly advisable to make sure the person fitting you with the hearing aid has proper training to test and fit you correctly. This usually involves an audiologist.

In most instances, hearing aids are used to help those that have difficulty hearing hear better. However, there are other uses for hearing aids. One of the most common other uses involves treatment for tinnitus or noise in the ears. Hearing aids provide natural sounds to overcome unnatural ringing or buzzing in the ears.

Learning To Use A Hearing Aid

It is important to have realistic expectations when beginning to use a hearing aid. Hearing aids do amplify sound and do a very good job of this. However, the sound is not the same as natural sound. Even the best stereo system is not as good as live sound. If one is listening to a recording of a band, the recording is very good on a CD player. However, that sound is still not as good as listening to the band in person. In the same way, hearing aids have their limitations.

There are many things that can be done to help in learning to use a hearing aid. It is advisable to start using a hearing aid in the best listening situations. This is generally in a quiet environment with familiar surroundings, such as in the home. Make sure the television or radio is turned off when you start wearing your hearing aid or let someone else adjust the volume to a comfortable level.

Since all hearing aids are digitally programmable, your hearing aid should be programmed to accommodate your hearing loss. It may take a few days or weeks to get used to your hearing aid

therefore it is okay to use it intermittently at first, then gradually building up your wear time.

Background noise can be a problem with or without a hearing aid. Digital hearing aids can amplify speech sounds and background noise. Most digital hearing aids have noise suppression features built in so background noise is not as overwhelming. Of course, it is helpful to try to eliminate as many background noises as possible. It is also helpful to try to focus your attention in the direction of the sound for which you are listening. In addition, many people will be hearing sounds that they have not heard in a long time or possibly ever. These minor sounds include the rustling of leaves, a refrigerator running, and other extraneous sounds that could be bothersome at first. Please do not be discouraged with these new sounds you are hearing as you will get used to them and learn to enjoy hearing the small sounds that you may not have heard in a long time.

Should I Use Two Hearing Aids?

Generally, it is advisable to use two hearing aids if the hearing loss is similar in both ears. Using two hearing aids helps tell which direction sound is coming from and improves your overall hearing and communication ability. It is very rare that you see a person wearing a monocle instead of glasses. In fact, you would probably think it very odd to use a corrective lens for one eye, when both don't see well. Nevertheless, many people think it is suitable when using hearing aids. One hearing aid is better than no hearing at all, but certainly less satisfactory than two hearing aids.

OTHER ASSISTIVE LISTENING DEVICES

Telephone Use

There are many devices available to help those with hearing loss. One of the most useful is a telephone amplifier. This is usually available through the telephone company. In addition, many hearing aids have a "T" or telephone switch that allows the telephone to directly amplify the hearing aid. Using a hearing aid without the "T" switch on the telephone can result in feedback or a squealing noise. Most new hearing aids are compatible with smart phones. They can either directly stream or use an accessory to stream phone calls.

There are also communication relay systems available. This involves an operator through the telephone company that relays messages from a telephone that a deaf person is using and speaks directly to a hearing person. Information about this is available through the telephone company.

Telephone communication devices for the deaf allow people that have complete loss of hearing to communicate via typed messages back and forth across the telephone. This requires a device available for both the sender and the receiver. This device is commonly known as TDD.

Television and Radio Helps

One of the easiest methods to help a hearing impaired person with television and radio is to wear a headset with a separate volume control that is plugged directly into the television or radio. Another

er device that is very helpful is an infrared system. This uses infrared light to transmit the signals from the television or radio to a person anywhere in the room. The transmitter is plugged into the wall and placed on the television set. The transmitter converts the sounds from the television into infrared light and it is received via a wireless headset. There are also similar devices available in many theaters, churches, and other public places that use an FM system. A wire loop is placed around the building and will induce the transmission of sound in a hearing aid. Most hearing aid companies sell devices that are compatible with television to stream directly to a hearing aid.

Alarm Clocks

A variety of different options are available to allow individuals with hearing loss to wake up on their own. These range from alarm clocks that have extremely loud alerts to those that have pillow or mattress vibrators. There are also alarm clocks available that allow the person to plug any electrical device, such as a lamp, into them.

Hearing Dog Program

These are dogs that are specially trained to help with an adult individual that is living alone. The dog can hear the doorbells or fire alarms, etc., and alert the hearing impaired individual.

Cochlear Implants

Cochlear implants are devices that are surgically implanted into the inner ear. They directly stimulate the remaining nerve elements within the inner ear. These devices are very useful for persons that receive little or no help with conventional hearing aids.

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