

Hearing Loss is the Number One Disability in the World

Hearing loss is prevalent in modern societies as a result of the combined effects of noise, aging, disease, and heredity. Hearing loss is the number one disability in the world; approximately 28 million Americans suffer some type of hearing loss. In addition, 15 of every 1000 people under the age of 18 have a hearing loss, and nearly 90% of people over age 80 have a hearing impairment. The incidence of hearing loss is greater in men, than women. The sad part is, that hearing loss is the most preventable disability in the world.

Hearing is a complicated process involving both the sensitivity of the ear, as well as the ability to understand, and interpret the speech. When we hear sounds, we really are interpreting patterns of air molecules in the form of waves. The ear is able to pick up these waves, and convert them into electrical signals that are sent to the brain. In the brain, these signals are deciphered into meaningful information, such as language or music with qualities like volume and pitch. We can characterize sounds in terms of their frequency (or pitch) and intensity (or loudness).

An individual with hearing in the normal range can hear sounds that have frequencies between 20 and 20,000 Hertz. Speech includes a combination of low and high frequency sounds; vowels have lower frequencies and are easier to hear. Consonants, on the other hand have higher frequencies, and are harder to hear. Since consonants express most of the meaning of what we say, someone who cannot hear high frequency sounds will have a hard time understanding speech.

Intensity, or loudness, is measured in decibels. A normal hearing range usually ranges from 0 to 140 dB. A whisper is around 30 dB, and normal conversations are usually 45 to 50 dB. Sounds that are louder than 90 dB can be uncomfortable to hear. A loud concert might be as loud as 110 dB. Extreme sounds that are 120 dB or louder can be quite painful and can result in temporary or permanent hearing loss.

Hearing loss can happen in either frequency or intensity or both. The severity of hearing loss is assessed on how well a person can hear the frequencies or intensities most often associated with speech. Severity of loss can best be described as mild, moderate, severe, or profound. Deafness is used to describe an individual who has approximately 90 dB or greater hearing loss. The term "hard of hearing" describes a condition that is less severe than deafness.

There are many potential causes of hearing loss. These can be divided into two basic types, called conductive and sensorineural hearing loss. Conductive hearing loss is the result of the interference of sound transmission from the outer ear to the inner ear. Common causes include, inner ear infections, accumulation of fluid in the middle ear, excessive wax, damage to the eardrum by infection or an injury, or otosclerosis. This type of hearing loss is temporary, and results in a less severe form.

Sensorineural hearing loss is due to damage to the pathway from the hair cells of the inner ear to the auditory nerve and the brain. Common causes include, age-related hearing loss, injury to the inner ear hair cells as a result of trauma or noise, abnormal pressure in the inner ear, stroke, benign lesions, and brain tumors. This type of hearing loss is more devastating, and is usually more permanent.

The successful treatment of hearing loss depends on the cause. A bacterial infection of the middle ear can be treated with antibiotics; blockages of the outer and middle ears can be cleared; damaged eardrums can be repaired surgically; and ossicles affected by otosclerosis can be replaced with artificial bones. Some causes of sensorineural hearing loss can also be improved. For example, an acoustic neuroma can be removed surgically.

If no cure is successful, a hearing aid for one, or both ears usually helps, whether the loss is a result of conductive or sensorineural problems. Many different types of hearing aid are available and an audiologist will advise as to which type best suits the needs of the individual.

When a hearing aid does not give adequate amplification, as with profound deafness, a cochlear implant can help. This device transmits sound directly into the auditory nerve via electrodes surgically implanted into the cochlea. Although the sounds heard tend to be of a buzzing or electronic nature, it can be very useful when used in combination with lip reading.

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