

Hearing Loss in Children

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Hearing loss directly impacts a child's ability to communicate. Children develop language and speech by hearing and imitating sounds in their environment; therefore, a child that cannot hear all the sounds in his/her environment has difficulty understanding, communicating, and learning about the world.



Causes of hearing loss vary from genetics, to infection, to injury. Children may be born with hearing loss (congenital) or acquire the loss during infancy or childhood. An audiologist (hearing specialist) or otolaryngologist (Ear, Nose, and Throat Doctor) can help determine the significance of a child's hearing loss and any treatments available that would benefit the child.

How We Hear

Sound waves travel from the source of the sound, such as a speaker, to the outer ear. The air continues through the ear canal to the eardrum and causes it to vibrate. The vibration of the eardrum triggers the bones of the middle ear—the malleus, incus, and stapes—to move up and down; this movement creates waves in the fluid of the inner ear, or cochlea. Tiny hair cells bend in the cochlea and stimulate the auditory nerve which transmits the auditory information to the brain. A breakdown in this system results in a hearing loss.

Types of Hearing Loss

When a child receives a diagnosis of hearing loss, the audiologist determines the type and severity of loss. Hearing losses can be conductive, sensorineural, or mixed. Severity ranges from mild to profound.

Conductive hearing loss happens when the auditory signal breaks down at the outer or middle ear. This may be due to temporary conditions such as fluid build up in the middle ear, ear infections such as Otitis Media, or wax build up in the ear canal. Other children may have malformations of the ear or ear canal that cause breakdown of the auditory signal. Medication or surgical interventions can often treat and remediate conductive hearing loss.

Sensorineural hearing loss results from damage or malformation of the inner ear or cochlea. This type of hearing loss is typically permanent and often medical or surgical treatment cannot remediate the issue. Children with sensorineural hearing loss often can benefit from wearing amplification systems such as hearing aids or cochlear implants that can amplify the auditory signal or bypass the damaged inner ear.

Mixed hearing loss consists of some combination of conductive and sensorineural components of hearing loss.

Severity of Hearing Loss

To determine severity of hearing loss, audiologists measure a child's detection of sound at a variety of different pitches and loudness levels. They refer to pitch as "frequency" and loudness level as "intensity." The audiologist creates a graph called an "audiogram" that shows the severity and shape of the child's hearing loss—the loudness levels at each frequency the child needs to hear. Hearing loss can be mild, moderate, severe, profound, or a combination of these.

Mild Hearing Loss—A child with a mild hearing loss may have difficulty hearing soft speech or conversational speech when there is background noise, such as in a restaurant.

Moderate Hearing Loss—A child with a moderate hearing loss may have trouble hearing normal conversational speech.

Severe Hearing Loss—A child with a severe hearing loss may have difficulty hearing loud speech and environmental sounds, such as a vacuum cleaner.

Profound Hearing Loss—A child with a profound hearing loss may not be able to hear loud speech or louder environmental sounds, such as a dog barking, or even a lawn mower running, without some type of amplification.

Looking at the Audiogram

After testing your child's hearing, the audiologist graphs the frequencies and intensities that your child can hear. Audiologists refer to this graph as an audiogram. The lines on the graph create a "shape" of the hearing loss. The shape may be flat, sloping, or create a curve called a "cookie bite." A flat shape means that a child hears at about the same intensity level across all frequencies. A sloping shape describes a need for more intensity (loudness) as sound moves across the different frequencies. For example, a child may demonstrate a mild hearing loss in the low frequencies, sloping to severe in the higher frequencies. Finally, the "cookie bite" shape refers to a hearing loss that is milder in the low and high frequencies, with a more significant loss in the middle frequencies.

Treatment of Hearing Loss

Regardless of type and severity, professionals (audiologists or otolaryngologists) are available to help manage or treat a child's hearing loss. Amplification systems, such as hearing aids or cochlear implants, and other medical or surgical treatments may help increase a child's hearing ability. Hearing is directly related to development of language, speech, reading, and writing, so parents and other professionals who suspect a hearing loss should seek further testing and treatment immediately.



Resource

National Institute on Deafness and Other Communication Disorders, NIDCD, from the National Institute of Health, <http://www.nidcd.nih.gov/health/statistics/hearing.asp> retrieved February 22, 2007.