

## Hearing & Amplification

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### Glossary

Have you ever felt that a doctor or another health professional was speaking a different language? As a parent of a baby who has been newly identified with hearing loss, medical and audiology terms may be unfamiliar territory. This section includes many of the terms and vocabulary that professionals use when they talk about hearing, causes of hearing loss and hearing aid devices. These terms are explained to help you as a parent communicate more easily with the professionals involved in your child's care.

**Acoustic Feedback:** a whistling sound produced by a hearing aid. The amplified signal generated by the receiver of the hearing aid leaks outside, enters the microphone, and then is re-amplified.

**Acquired Deafness:** a loss of hearing that occurs or develops some time during the lifespan but is not present at birth.

**Air Conduction (AC):** the process by which sound is sent (conducted) to the inner ear through the external ear canal and middle ear. Air-conduction testing is performed by sending sounds to the ear through an earphone or loudspeaker.

**Air-Bone Gap:** a difference between hearing responses for earphone or loudspeaker (air conduction) versus bone vibrator (bone-conduction) stimulation. A gap or difference between air-conduction and bone-conduction responses indicates conductive hearing loss due to problems in the middle ear.

**Americans with Disabilities Act (ADA):** signed into law in 1990, this is a "civil rights act" for persons with disabilities. The ADA requires public services and buildings to make reasonable accommodations to allow access to persons with disabilities, including hearing loss.

**American Sign Language (ASL):** a manual language with its own word order and grammar, used primarily by people who are deaf.

**Amplifier:** an electronic device for increasing the strength or gain of an electrical signal.

**Assistive Listening Device (ALD):** devices, other than hearing aids, that improve listening for individuals with hearing loss. Some systems improve hearing in noisy situations by positioning the microphone closer to the sound source, or improve the quality of amplified speech or music. Includes FM systems, infrared systems, and induction loop systems.

**Atresia (aural):** an ear malformation in which there is an absence of the external ear canal, usually with abnormalities of the outer ear, and/or middle ear space.

**Audiogram:** a graphic representation of hearing loss, showing the amount of hearing loss (in decibels or dB ) at different frequencies (250 - 8000 Hertz or Hz).

**Audiologist:** a health care professional who is trained to evaluate hearing loss and related disorders, including balance (vestibular) disorders and tinnitus, and to rehabilitate individuals with hearing loss and related disorders. An audiologist uses a variety of tests and procedures to assess hearing and balance function and to fit and dispense hearing aids and other assistive devices. The minimum academic degree is a Master's. State licensure is required to practice audiology in most states.

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**Audiology:** the study of hearing; the profession is concerned with measurement and rehabilitation of auditory and communication problems.

**Audiometer:** a device for presenting precisely measured tones of specific frequencies (or speech and recorded signals) and intensity levels in order to obtain an audiogram.

**Auditory Brainstem Response (ABR) test:** a test that can be used to assess auditory function in infants and young children using electrodes on the head to record electrical activity from the hearing nerve. Other terms are: Brainstem Evoked Response (BSER), Brainstem Auditory Evoked Potential (BAEP), and Brainstem Auditory Evoked Response (BAER).

**Auditory Neuropathy/Dysynchrony:** a term that describes a pattern of abnormal findings for a number of audiometric measures, e.g., auditory brain stem response (ABR), pure-tone and speech audiometry, and/or acoustic reflexes, yet normal findings for otoacoustic emissions (OAE). The most common pattern is the absence of an ABR with normal OAE.

**Auditory Nerve:** the cranial nerve (VIII) that carries nerve impulses from the inner ear to the brain.

**Auditory Training:** listening to environmental sounds, music and speech to practice recognizing and understanding what has been heard.

**Aural (re)habilitation:** specialized training for people with hearing loss to help them learn spoken communication skills through speechreading and auditory training.

**Balance:** the biological system that enables individuals to know where their bodies are in the environment and to maintain a desired position. Normal balance depends on information from the labyrinth or vestibular system in the inner ear and from other senses such as sight and touch.

**Balance Disorder:** a disruption in the labyrinth, the inner ear organ that controls the balance system, which allows individuals to know where their bodies are in the environment. The labyrinth works with other systems in the body, such as the visual and skeletal systems, to maintain posture.

**Behavioral Observation Audiometry (BOA):** a pediatric audiometric procedure in which behavioral responses to sounds (e.g., eye opening, head turning) are detected by an observer. This procedure has been shown to be unreliable and affected by observer bias. It has been replaced by newer test methods (see Auditory Brainstem Response, Visual Reinforcement Audiometry).

**Bilateral Hearing Loss:** a hearing loss in both ears.

**Binaural:** both ears.

**Bone Conduction:** the transmission of sound (mechanical vibrations) through the bones of the skull to the inner ear. Bone conduction testing is completed using a bone oscillator (vibrator) that is placed on the mastoid bone behind the ear or on the forehead.

**Bone-conduction Hearing Aid:** a hearing aid in which the amplified signal directly stimulates the inner ear via a bone vibrator placed on the mastoid bone behind the ear. This type of hearing aid typically is used for individuals with atresia or chronic ear drainage.

**Captioning:** a text display of spoken words, presented on a television or a movie screen that allows a deaf or hard-of-hearing viewer to follow the dialogue and the action of a program simultaneously.

**Central Auditory Processing Disorder (CAPD):** a language disorder that involves the perception and processing of information that has been heard. Children with CAPD have problems following spoken instructions and usually show other language-learning problems, even though the inner ear is functioning normally.

**Cerumen:** ear wax.

**Chloral Hydrate:** a common medication used to induce sleep, sometimes used during ABR testing with children.

**Cochlea:** also called the "inner ear." A snail-shaped structure that contains the sensory organ of hearing and changes sound vibrations to nerve impulses. The impulses are carried to the brain along the VIII nerve, or auditory nerve.

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**Cochlear Implant:** a medical device that is surgically implanted and bypasses damaged inner ear structures and directly stimulates the auditory nerve, helping individuals who have severe to profound hearing loss to interpret sounds and speech.

**Conditioned Play Audiometry (CPA):** a type of hearing test in which the audiologist teaches the child to respond when a sound is heard by playing some type of game. For example, the child puts a peg in a hole or a block in a bucket every time a sound is heard.

**Conductive Hearing Loss:** a loss of sensitivity to sound, resulting from an abnormality or blockage of the outer ear or the middle ear. The most common cause of conductive hearing loss is middle ear fluid or infection. Other causes include wax buildup in the ear canal, a hole in the eardrum, or damage to the tiny bones of the middle ear.

**Congenital Hearing Loss:** a hearing loss that is present from birth and which may or may not be hereditary.

**Cytomegalovirus:** one group of herpes viruses that infects humans and can cause a variety of symptoms, including deafness or hearing impairment. Infection with the virus may be before, at or after birth.

**Deaf:** a term used to describe persons who have a hearing loss greater than 90 dB HL. It also may be used to refer to those who consider themselves part of the Deaf community or culture and choose to communicate using American Sign Language instead of spoken communication.

**Decibel (dB):** the unit that measures the intensity of sound.

**Direct Audio Input:** the capability of connecting a sound source, such as a TV or tape recorder, directly into a hearing aid. Also refers to the connection of an FM auditory trainer directly into a hearing aid.

**Dizziness:** a physical unsteadiness, imbalance, and lightheadedness associated with balance disorders. See vertigo.

**DSL [i/o]:** Desired Sensation Level; a hearing aid fitting method designed specifically for children.

**Dynamic Range:** the difference between the softest sounds one can hear and the loudest sound tolerated.

**Ear Canal:** the passageway from the outer ear to the eardrum.

**Eardrum:** also called the tympanic membrane; the eardrum separates the outer ear from the middle ear and is important in conducting sound to the middle ear and inner ear.

**Ear Infection:** the presence and growth of bacteria or viruses in the ear.

**Earmold:** a custom-made mold, used with a behind-the-ear hearing aid, which delivers amplified sounds into the ear.

**Earphone:** a device for presenting sounds to the ear. Earphones may fit over the external ear or fit into the ear canal.

**Ear Wax (cerumen):** a normal secretion from glands in the outer ear that keeps the skin of the ear dry and protected from infection.

**Educational Audiologist:** an audiologist with special training and experience to provide auditory rehabilitation services to children in school settings.

**Electronystagmography (ENG):** a test of vestibular function that uses cool and warm water or air to stimulate the vestibular system of each ear.

**ENT:** ear, nose, and throat.

**Eustachian Tube:** a small passageway from the back of the throat to the middle ear that allows air into the middle ear.

**External Ear:** the outer portion of the ear that is normally visible. Components of the external or outer ear include the pinna and the external ear canal.

**Feedback:** the shrill whistling sound made when amplified sound from the hearing aid receiver goes back into the microphone of the hearing aid. Feedback can be caused by an earmold that does not fit properly or a damaged hearing aid.

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**FM System:** an assistive listening device that improves listening in noise. Signals are transmitted from a talker to the listener by FM radio waves.

**Frequency:** the unit of measurement related to the pitch of a sound. Frequency is expressed in Hz (Hertz) or cps (cycles per second). The more cycles per second, the higher the pitch.

**Functional Gain:** the difference in a person's responses between aided and unaided threshold measures. Functional gain is less reliable and valid than other methods of testing aided benefit.

**Gain:** an increase in the amplitude or energy of an electrical signal with amplification. Gain is the difference between the input signal and the output signal.

**Hair Cells:** the hair-like structures in the inner ear that transform the mechanical energy of sound waves into nerve impulses.

**Hard of Hearing:** the term to describe those with mild to severe hearing loss.

**Hearing Aid:** an electronic device that brings amplified sound to the ear. A hearing aid usually consists of a microphone, amplifier, and receiver.

**Hearing Aid Evaluation (HAE):** the process of selecting an appropriate hearing aid. The audiologist will evaluate different types of hearing aids to determine which is best suited to a particular hearing loss.

**Hearing Disorder:** a disruption in the normal hearing process that may occur in the outer, middle, inner ear or the nerves to the brain.

**Hearing Loss (or impairment):** a problem with hearing that is characterized by decreased sensitivity to sound in comparison to normal hearing. See conductive, sensorineural, and mixed hearing loss.

**Hearing Threshold Level (HTL):** the faintest intensity level (in dB hearing level) that a person can hear a sound of a particular test frequency. A completely normal HTL is 0 dB. Also known as HL.

**Hereditary Hearing Impairment:** hearing loss passed down through generations of a family.

**Hertz (Hz):** cycles per second. Frequency is denoted in Hz.

**Inner Ear:** the part of the ear that contains both the organ of hearing (the cochlea) and the organ of balance (the labyrinth).

**Localization:** the ability to determine the direction of a sound source.

**Long-Term Spectrum of Speech (LTSS):** the overall level and configuration of speech energy representing typical conversations levels of speech.

**Mastoid Bone:** a portion of the temporal bone located behind the external ear. Bone-conduction stimulation often is applied to the mastoid bone.

**Microtia:** abnormal growth of the outer ear. Severity varies from minor skin tags or differences in ear shape to complete absence of the outer ear.

**Middle Ear:** the part of the ear that includes the eardrum and three tiny bones (ossicles) of the middle ear, ending at the round window that leads to the inner ear.

**Mixed Hearing Loss:** a hearing loss with both conductive (middle ear pathology) and sensory (cochlear or VIIIth-nerve pathology) components. The audiogram shows a bone-conduction hearing deficit plus a gap between earphone and bone-conduction responses.

**Multimemory:** hearing aids that have the ability to store different listening programs for access by the user.

**Nonsyndromic Hereditary Hearing Impairment:** a hearing loss or deafness that is inherited and is not associated with other inherited physical characteristics.

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**Ossicles:** the chain of three tiny bones in the middle ear (malleus, incus, stapes).

**Otitis Externa:** an inflammation of the outer part of the ear extending to the auditory canal.

**Otitis Media:** an inflammation of the middle ear caused by infection.

**Otitis Media with Effusion (OME):** otitis media with fluid present in the middle ear.

**Otoacoustic Emissions (OAE):** low-intensity sounds produced by the inner ear that can be measured with a sensitive microphone placed in the ear canal.

**Otolaryngologist:** a physician/surgeon who specializes in diseases of the ear, nose, throat, head and neck.

**Otologist:** a physician/surgeon who specializes in the treatment of ear problems.

**Otology:** the branch of medicine dealing with the ear.

**Outer Ear:** the external portion of the ear that collects sound waves and directs them into the ear. The outer ear consists of the pinna and the ear canal.

**Postlingually Deafened:** an individual who becomes deaf after having acquired language.

**Pressure-Equalizing (PE) Tube:** a tube that is inserted in the eardrum to equalize the pressure between the middle ear and the ear canal and to permit drainage. Also called a tympanostomy tube.

**Prelingually Deafened:** an individual who is either born deaf or who lost his or her hearing early in childhood, before acquiring language.

**Probe Microphone:** a tiny microphone attached to a soft, small tube. The probe microphone is placed in the ear canal and is used to measure a variety of sounds during a hearing aid evaluation.

**Real-Ear-to-Coupler Difference RECD:** the difference, in decibels and across frequencies, between the response of a hearing aid measured in a real ear versus a standard coupler. The RECD is a measure that allows the audiologist to accurately specify the sound levels delivered to the ears of infants and young children.

**Real Ear Measurement:** a test technique used to measure the sound levels in the ear canal produced by a hearing aid. A probe microphone is placed in the ear canal alongside the hearing aid.

**Residual Hearing:** the amount of measurable, usable hearing.

**Sensorineural Loss:** a hearing loss caused by damage to the inner ear (cochlea) and/or the hearing nerve.

**Sign Language:** a method of communication used primarily by people who are deaf or hard of hearing in which hand movements, gestures, and facial expressions convey grammatical structure and meaning.

**Speech Frequencies:** the frequencies within the 500 to 4000 Hz region, which are most important for hearing and understanding of speech.

**Speech Awareness Threshold (SAT):** the lowest hearing level in dB at which a person can detect the presence of a speech signal. Also known as the speech detection threshold (SDT).

**Speech Recognition Threshold (SRT):** the lowest hearing level in dB at which 50 percent of two-syllable (spondee) words can be identified correctly. Also known as the ST (speech threshold or spondee threshold).

**Speech-Language Pathologist:** a professional who evaluates and provides treatment for speech, language, cognitive-communication, and swallowing problems of children and adults. Speech and language delays are frequently seen in children with hearing impairments. Minimum academic degree is a Master's degree. State licensure is required to practice speech-language pathology in many states.

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**Sudden Deafness:** the loss of hearing that occurs quickly due to such causes as an explosion, a viral infection, or the use of some drugs.

**Syndromic Hearing Impairment:** a hearing loss that is accompanied by additional physical characteristics (e.g., blindness, mental retardation or involvement of other organs).

**Telecoil:** a wire coil contained within a hearing aid that picks up magnetic energy available from telephones or other assistive listening devices.

**TTY/TTD:** a device for severely or profoundly hearing-impaired persons to send or receive written messages transmitted via telephone lines.

**Threshold:** the softest level at which a sound can be heard 50 percent of the time. The term is used for both speech and pure tone testing.

**Tinnitus:** a sensation of ringing, roaring, or buzzing sound in the ears or head. It is often associated with hearing impairment and noise exposure.

**Tympanogram:** a measure of tympanic membrane (eardrum) mobility.

**Tympanostomy Tube:** See Pressure-Equalizing tube.

**Unilateral Hearing Loss:** a hearing loss in one ear only.

**Vertigo:** A spinning sensation, sometimes occurring with nausea and/or vomiting.

**Vestibular System:** the system in the body that is responsible for maintaining balance, posture, and the body's orientation in space. This system also regulates body movement and keeps objects in visual focus as the body moves.

**Volume Control:** a device for increasing or decreasing the gain or volume of a hearing instrument.

**Visual Reinforcement Audiometry (VRA):** a pediatric hearing test procedure in which the child's responses to sound are reinforced with a visual event (e.g., a moving toy). This procedure is most appropriate for children in the 6 month to 3 year age range.

**Wide Dynamic Range Compression:** a special type of hearing aid or amplification device that compresses a wide range of sounds into a narrower range. This makes soft sounds easier to hear and makes loud sounds more comfortable for listening.