



BOOM! CRACK! ZOINK! TWEET! SHHH! No, this is not an episode of the 1960's Batman television series. It is your sense of hearing at work. Hearing is developed in-utero by 16-20 weeks gestational age. The sense of hearing helps us communicate with one another. Hearing alerts us to the sounds of our environment. It allows you to be aware of threats around you, to hear the sweet words of loved ones and the sounds of nature. Your sense of hearing can be damaged by illnesses, certain medications, injury to the head or ear, birth defects or genetics, aging, and by being exposed to loud sounds for an extended amount of time.

Hearing plays a vital and often subtle role in the early development of a child. Children learn speech and language from listening to others around them. If a hearing loss exists, a child may not be able to receive optimal benefit from spoken language during this period of growth, and as a result, delays in speech and language may occur. Many hearing problems are minimal, yet developmentally significant. It is important that even the slightest hearing loss be identified so that appropriate developmental management can be provided. In fact, anyone can have hearing loss. There are more than 40 million Americans with hearing loss. While hearing loss in infants affects them developmentally, hearing loss for adults can be frustrating, isolating and can lead to depression. It is important to protect your hearing and to have your hearing evaluated annually.



How Hearing Works

Sound travels in waves. It moves through the outer ear and into the middle ear where it hits the ear drum. The ear drum vibrates and send the vibrations along to the three smallest bones in the body (the malleus, incus, and stapes). These vibrations are sent on to the inner ear where the transmitted sounds travel through the cochlea (a snail shaped) organ. The cochlea is filled with liquid, which is set into motion, like a wave, when the ossicles vibrate. The cochlea is lined with over 10,000 cells. The vibrations cause the hair cells to move, creating a nerve signal that the brain understands as sound.



How Hearing is evaluated

For Infants

Over 98% of all infants in Wyoming have a Newborn Hearing Screening (unless parents object or waive the screening) prior to being discharged from the hospital birth stay.

AABR - The hearing screening, in all 21 Wyoming birthing hospitals, is completed using an Automated Auditory Brainstem Response (AABR). The AABR screening works by recording brain activity in response to sounds. The AABR is part of the EEG. The AABR equipment sends a series of clicking sounds through headphones. Three electrodes are placed on the newborn's head, and the leads are connected to the computer equipment. If the newborn's auditory response matches the algorithm in the computer, the newborn passes the screening. If the auditory response does not match the algorithm, the newborn fails the hearing screening.



Diagnostic Auditory Brainstem Response (ABR) – For children who have failed their screening AABR twice, they are referred for an ABR. An ABR test is recommended as part of a complete audiologic diagnostic evaluation for children younger than 3 years for confirmation of permanent hearing loss. This test is much like an AABR, but is diagnostic in nature. Three electrodes are placed on the newborn's head and the leads are connected to the computer equipment. While the baby sleeps, clicking sounds are made through tiny earphones in the baby's ear. The test measures the brain activity in response to sounds. It is a critical procedure in the initial test battery because it is an accurate and reliable predictor of hearing loss in infants who are too young to respond to behavioral testing. The ABR measurement provides information on the degree, type, and configuration of a hearing loss and allows the audiologist to fit an infant with a hearing aid when needed.

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For Toddlers, Children and Adults

Behavioral Testing - Once a child is old enough to demonstrate a behavioral response to sound, the audiologist will test the child or adult in a sound booth. His/her response to sound at different frequencies and decibels will be recorded. This test is useful to determine precise thresholds at specific frequencies for each ear.

Types of Hearing Loss

There are four basic types of hearing loss:

Conductive Hearing Loss is caused by problems in the outer and/or middle ear. This type of loss may be permanent or temporary. It can often be medically or surgically corrected.

Sensorineural Hearing Loss is caused by problems in the cochlea and/or inner ear. This is a permanent hearing loss that usually cannot be medically or surgically corrected.

Mixed Hearing Loss is a combination of a Conductive and Sensorineural hearing loss.

Central Auditory Processing Disorder is a condition where the brain does not process acoustic signals auditory signals. Sound can be heard, but the information does not reach the brain in a typical or efficient manner.

Managing Hearing Loss with Technology



Hearing Aids

Hearing aids provide amplification of speech and sound. A person can be fit with hearing aids as early as 1-month of age.

Cochlear Implants

Not all individuals are candidates for a cochlear implant. It is dependent on the on the type, degree and progressive nature of their hearing loss.

Cochlear Implants are devices that are implanted surgically, consisting of external and internal components. An eligible person can be implanted at 12 months of age (after a 6-month hearing aid trial).

Approximately 3-4 weeks after surgery the Cochlear Implant device is activated.

Sounds are gradually programmed (mapped) into the device allowing access to sound and speech.



BAHA

A bone anchored hearing device is a surgically implantable system for treatment of hearing loss that works through bone conduction. Candidates for a BAHA have one or more of the following: a conductive hearing loss, single-sided hearing loss, may have malformed ears, have draining ears, or suffer from sore or irritated ears due to hearing aids or battle distorted sound quality.

Hearing is a gift and can affect the quality if your life. Protecting hearing is important. If you have concerns about your hearing make an appointment with a licensed audiologist to have your hearing evaluated and pursue hearing devices.