



Frequently *A*sksed *Q*uestions
for
Healthcare Professionals
about Universal Newborn Hearing Screening
and Hearing Loss

What is the purpose of Universal Newborn Hearing Screening?

The purpose of newborn hearing screening is to identify children who are at greater risk for hearing loss so they may receive timely diagnostic and intervention services. Screening tests identify a need for further diagnostic hearing evaluations.



Why screen all newborns? Why not just those identified as high risk by the Joint Committee on Infant Hearing?

The Joint Committee's high risk criterion for possible late-onset hearing loss include but are not limited to: any illness or condition requiring admission to a NICU for 48 hours or more, a syndrome associated with congenital or progressive hearing loss, a family history of permanent childhood hearing loss, craniofacial anomalies, bacterial meningitis, severe hyperbilirubinemia, head trauma, recurrent otitis media, and parental concern.

However, 50% of children with congenital hearing loss don't meet any of these risk criteria, and would not be identified if the high-risk register was used as the only criterion for screening newborns.



Is it mandatory for all infants born on Guam to receive a newborn hearing screening?

Public Law 27-150, also known as the "The Universal Newborn Hearing Screening and Intervention Act (UNHSIA) of 2004" mandates that each newborn born on Guam receive a hearing screening at the birthing site.

What is the incidence of hearing loss in newborns?

Approximately 3 in 1000 babies are born with a hearing loss. One in 1000 babies is born deaf. Ninety percent (90%) of children with hearing loss are born to hearing parents. The earlier the hearing loss is identified, the sooner medical treatment and critical intervention may begin. If the child has no other disabling condition and intervention begins by age 6 months old, research have shown that the child's speech and language abilities and later learning will be improved.

How young can a child's hearing be effectively tested?

Hearing can be assessed at any age, even as young as 12 hours old. There are two major ways hearing in infants can be tested; Auditory Brainstem Response (ABR) and Evoked Otoacoustic Emissions (EOAE) evaluations are an effective and efficient means for identifying and quantifying hearing loss. At this time, only the EOAE evaluation is performed before the infant is discharged from the birthing site.

What is the difference between ABR and an EOAE evaluation?

The major difference is in how the tests are conducted. The ABR evaluation is conducted by placing electrodes on the child's forehead and mastoid areas. Earphones are used to deliver sound to the child's ear, either in the form of a click or pure tone stimulus. The ABR measures the neural response from the cochlea to the brainstem. It is a measure of neural synchrony along the auditory pathway.

On Guam, the ABR is done by an audiologist when the baby does not pass the hearing screening using EOAE.



The EOAE evaluation is performed by placing a small earphone into the child's ear. Sounds are then introduced into the ear. "Echo" responses, or emissions, are measured in healthy ears. EOAEs are acoustic signals generated by the cochlea, specifically, outer hair cells, in response to auditory stimulation. In response to click stimuli, EOAEs provide information over a broad frequency range (~500 to 6000 Hz). When EOAEs are present, this indicates that a child has no greater than a mild hearing loss.



What are the referral rates for these tests?

Guam's referral rate is currently around 15%. Referral rates have decreased significantly in the last few years due to advancements in equipment and technology.

If a child passes the newborn screening, when should they be tested again?

Children with any risk factors should be re-evaluated at 6 months of age and annually thereafter, at least until the age of 3. If speech-language milestones are delayed, or if a child has more than four episodes of otitis media in one year, the child should have their hearing re-evaluated annually. Additionally, whenever the child's parent is concerned about the child's hearing, re-evaluation is recommended.

What does it mean if a baby needs to be re-screened?

It is important for parents to understand that referral for a second screening does not necessarily mean that their baby has a hearing loss. Information about hearing screening must be provided to parents in a professional, thoughtful, and sensitive manner. Parental stress should be minimized while conveying the importance of appropriate and prompt follow-up, as well as early intervention, if it is deemed necessary.

The most common reasons that a child would need a re-screen include otitis media with effusion, an ear canal blocked with debris or fluid, or a permanent hearing loss.

What is a pediatric diagnostic hearing evaluation?

This evaluation would consist of utilizing assessment tools to determine if there is a hearing loss and the type and degree of the hearing loss. It may include a diagnostic ABR that would determine the child's hearing thresholds, a repeat EOAE, and a tympanogram which would assess if there is otitis media with effusion. Pure tone stimuli are used in order to determine hearing thresholds at specific frequencies.

Why not wait until babies are older before children are tested for hearing loss?

The critical period for the acquisition of speech and language is from birth to 3 years, making early identification crucial. Children with hearing loss, even those with mild to moderate losses, who are identified later in life, may have social-emotional difficulties as well as language and educational delays. These delays may continue throughout the child's academic years. Parent-child relationships are compromised when there is an unrecognized difference in hearing status between parent and child. The earlier a hearing loss is identified and intervention begins, the more natural parent-child communication may become. This enhances parent-child bonding and the child's social-emotional, cognitive, and language development.



How is hearing tested in older babies?

As children grow, the testing techniques also change. ABR and EOAEs are commonly used until a child is old enough to provide behavioral responses to sound, usually around 7-8 months of age. By this age, behavioral tests such as

Visual Reinforcement Audiometry (VRA) can be used as an additional audiological assessment tool.

What if a hearing loss is identified?

The goal of universal newborn hearing screening is to identify children with hearing loss early, in order to initiate intervention services by 6 months of age. Intervention services include properly fitted amplification, family-focused communication strategies, early childhood services, and parental support groups.



How can a parent connect with another family of a child with hearing loss?

If a parent would like to connect with another family of a child with hearing loss, they can call the Guam Early Hearing Detection and Intervention (Guam EHDI) office at 735-2466 or go to the Guam EHDI website at www.guamehdi.com and click on the Parent-to-Parent link. They can also ask their Service Coordinator or Service Provider from the Guam Early Intervention System (GEIS) at 735-2414 to connect them with other parents of a child with hearing loss.

How can the impact of hearing loss be minimized?

Studies have shown that the earlier the hearing loss is identified and intervention services begin, the greater the chance for the child to reach his/her potential and success in life.



What can you, as a healthcare professional do?

Parents rely on and respect your judgment. Your encouragement and recommendations to families regarding follow-up for newborns that need to be re-screened are vital.

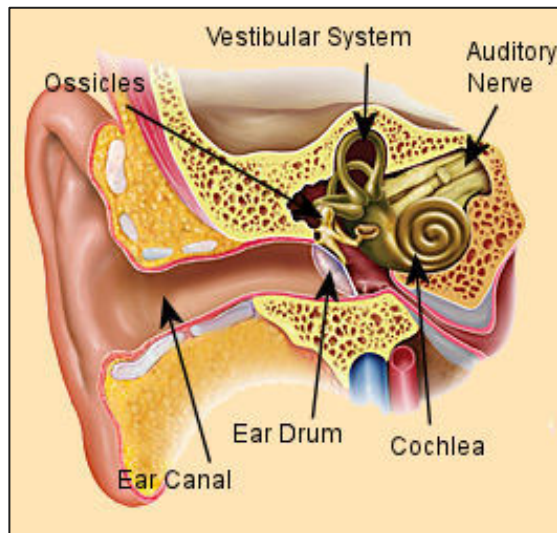


Additionally, you are the professional best able to monitor the child's speech and language development, and are entrusted to refer the child for a hearing evaluation or refer to Guam Early Intervention Services when you or the parents have concerns.

If you have any questions or would like more information on newborn hearing screening, please call the Guam EHDl Project at 735-2466 or send an e-mail to nenehearing@guamehdi.com. You may also visit the website at www.guamehdi.com.



Types of Hearing Loss



Anatomy of the Ear

Conductive hearing loss: occurs when sound is not conducted efficiently through the outer ear canal to the eardrum and ossicles (the tiny bones), of the middle ear. It usually involves a reduction in sound level, or the ability to hear faint sounds. This type of hearing loss can often be medically or surgically corrected.

Sensorineural hearing loss: occurs when there is damage to the cochlea (inner ear) or to the nerve pathways that are retrocochlear (behind the cochlea) to the brain. It cannot be medically or surgically corrected and is a permanent loss. This type of loss not only involves a reduction in sound level, or the ability to hear faint sounds, but it also affects the ability to hear clearly and understand speech.

Mixed Hearing Loss: sometimes a conductive hearing loss occurs in combination with a sensorineural hearing loss. This means that there may be damage in the outer or middle ear and in the cochlea or auditory nerve.

Milestones of Normal Hearing and Speech Development

0 - 4 months

Stops movement or quiets in response to speech. Startles to loud sounds. Moves eyes toward sound source. Arouses from light sleep to sudden loud noises.

4 - 7 months

Begins head turn toward sounds and voices out of sight (4 months). Turns head directly toward the sound source (7 months). Smiles in response to speech. Looks in response to own name. Babbling begins.

7 - 9 months

Turns to find a sound source out of sight. Gurgles or coos to sounds out of sight. Uses intonation patterns heard in speech. Comprehends "no." Babbles in multiple syllables.

9 - 12 months

Acquires first true word. Imitates sounds. Looks at a common object when named. Responds to music. Understands simple commands.

13 - 18 months

Uses sentence-like intonation. Perceives emotions of others. Uses 3 - 20 words. Uses all vowels and consonants in jargon

19 - 24 months

Uses more words than jargon. Asks question by rising intonation at end of phrase. Comprehends about 300 words. Uses about 50 words. Produces animal sounds. Combines two words into phrases. Listens to simple stories.

Helpful Websites

www.agbell.org

The Alexander Graham Bell Association for the Deaf and Hard of Hearing (AG Bell) is a resource, support network, and advocate for listening, learning, talking, and living independently with hearing loss.

www.babyhearing.org

Resources and information regarding early hearing screening, detection, and intervention and parent-to-parent supports.

www.boystownhospital.org

Research programs focused on childhood deafness, visual impairment, and related communication disorders.

www.cdc.gov

The U.S. Center for Disease Control.

www.cuedspeech.org

The National Cued Speech Association champions effective communication, language development, and literacy through the use of Cued Speech.

www.deafchildren.org

The American Society for Deaf Children's mission is to provide support, encouragement, and information to families raising children who are deaf or hard of hearing.

www.hearingexchange.com

Provides resources for Hearing Loss, Cochlear Implants, and Parenting Deaf and Hard of Hearing Children.

www.infanthearing.org

The National Center for Hearing Assessment and Management conducts research, training, and technical assistance activities to ensure early identification of infants with hearing loss and timely and appropriate audiological, educational, and medical intervention is provided.

www.mariondownshearingcenter.org

The Marion Downs Hearing Center provides service, resources, education, and research to support the needs of individuals who are deaf and hard of hearing and their families, as well as other health care professionals.

References

Frequently Asked Questions adapted from the Children's Hospital & Regional Medical Center pamphlet "*Universal Newborn Hearing Screening: Frequently Asked Question for Pediatricians and Family Practitioners*"; The Hearing, Speech, & Deafness Center (<http://www.hsd.org>); The American Speech-Language-Hearing Association (<http://www.asha.org>).



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