WHITE-WILSON EAR, NOSE & THROAT SPECIALISTS

Hearing Screening for Newborns and Infants

Universal Newborn Hearing Screening has been required in the state of Florida since 1990. This program permits us to detect hearing loss in infants so that intervention [whether medical, surgical or audiologic] can begin as early as possible. Babies can be tested within hours of birth using electrophysiologic techniques.

Hearing screening for newborns before they leave the hospital or maternity center is now becoming a common practice. Without such programs, the average age of hearing loss identification is between 12-25 months.

When hearing loss is detected late, language development is already delayed. Children are more likely to perform below their grade level, and are more likely to be held back, drop out of school, and fail to earn a high school diploma. These consequences are in sharp contrast to those for children who are identified early, receive early intervention, and then are found to function at the level of their peers by the time they enter school.

Hearing Screening Techniques for Newborns and Infants

Screening procedures for newborns and infants can detect permanent bilateral or unilateral, sensory or conductive hearing loss, averaging 30 to 40 dB or more in the frequency region important for speech recognition (approximately 500 - 4000 Hz).

The screening of newborns and infants involves use of non-invasive, objective physiologic measures that include otoacoustic emissions (OAEs) and/or auditory brainstem response (ABR). Both procedures can be done painlessly while the infant is resting quietly.

Otoacoustic emissions are inaudible sounds from the cochlea when audible sound stimulates the cochlea. The outer hair cells of the cochlea vibrate, and the vibration produces an inaudible sound that echoes back into the middle ear. This sound can be measured with a small probe inserted into the ear canal. Persons with normal hearing produce emissions. Those with hearing loss greater than 25-30 dB do not. OAEs can detect blockage in the outer ear canal, middle ear fluid, and damage to the outer hair cells in the cochlea.

Auditory brainstem response is an auditory evoked potential that originates from the auditory nerve. It is often used with babies. Electrodes are placed on the head, and brain wave activity in response to sound is recorded. ABR can detect damage to the cochlea, the auditory nerve and the auditory pathways in the stem of the brain.

What happens if an infant does not pass the screening?

Infants who do not pass a screening are often given a second screening to confirm findings and then referred for follow-up audiological and medical evaluations that should occur no later than 3 months of age. These evaluations confirm the presence of hearing loss; determine the type, nature, and (whenever possible) the cause of the hearing loss; and help identify options for treatment. Even if the infant passes screening, certain conditions do not produce immediate hearing loss. Rather, the hearing loss occurs later in the child's development.

Infants with any of the following **indicators for progressive or delayed-onset hearing loss** should receive audiologic monitoring every six months until age 3 years:

1. Parental or caregiver concern regarding hearing, speech, language, and/or developmental delay.
2. Family history of permanent childhood hearing loss.
3. Characteristics or other findings associated with a syndrome known to include a sensorineural and/or conductive hearing loss.
4. Postnatal infections associated with sensorineural hearing loss including bacterial meningitis.
5. In utero infections such as cytomegalovirus, herpes, rubella, syphilis, and toxoplasmosis.
6. Neonatal indicators--specifically hyperbilirubinemia at a serum level requiring exchange transfusion, persistent pulmonary hypertension of the newborn associated with mechanical ventilation, and conditions requiring the use of extracorporeal membrane oxygenation (ECMO)
7. Syndromes associated with progressive hearing loss such as neurofibromatosis, osteopetrosis, and Usher's syndrome
8. Neurodegenerative disorders, such as Hunter syndrome, or sensory motor neuropathies, such as Friedreich's ataxia and Charcot-Marie-Tooth syndrome.
9. Head trauma
10. Recurrent or persistent otitis media with effusion for at least 3 months.

Legal Requirements regarding Hearing Loss in Infants and Toddlers

The Individuals with Disabilities Education Act (IDEA) requires states to maintain a statewide system of early intervention services for infants and toddlers. It is required that infants and toddlers with disabilities be identified and evaluated using at risk criteria and appropriate audiologic screening techniques. After a hearing loss is confirmed, coordination of services should be facilitated by the infant' s medical manager and the IDEA coordinating agencies.

Contact your local school district or your state or local health department to find out how to obtain screenings/evaluations and intervention services through your state' s Early Intervention program.