

## Understanding Your Child's Hearing Tests

Hearing can be checked at any age. Newborns in the U.S. have their hearing screened before they leave a hospital. Parents of infants born at home or in a birth center should arrange to bring them in for screening by one month old. Hearing screenings are repeated at different ages because hearing can change over time. Screenings are done by people trained in that process. The results are recorded as “pass” or “refer” (sometimes listed as “fail”). Babies who are referred should be tested by three months of age. A referral might involve a repeat screening, a diagnostic evaluation and/or other tests to check for hearing loss. A complete audiological evaluation may include several tests.

Objective tests measure the function of the outer ear, middle ear, inner ear, hearing nerve and the brainstem. These tests can be done with any age child. Objective tests include:

- **Tympanometry and Acoustic Reflexes**

Tympanometry measures the movement of the ear drum and the size of the ear canal. The results show if there is middle ear fluid or negative pressure requiring medical treatment. This is helpful information for doctors if a child has a cold or chronic congestion. Acoustic reflexes measure the contraction (reflex) of the middle ear muscles in response to loud sounds. Both tests take just a few minutes to complete.

- **Otoacoustic Emissions**

Otoacoustic Emissions (OAEs) examine the cochlea, the organ of hearing. A small probe inserted in the ear canal emits sounds and records the cochlea's response. “Present” otoacoustic emissions usually reflect normal inner ear function. “Absent” OAEs may indicate a middle or inner ear problem and/or a hearing loss.

- **ABR and Auditory Steady State Responses**

The Auditory Brainstem Response (ABR, BERA, BAER) and Auditory Steady State Response (ASSR) tests measure how the hearing nerve responds to sounds and conveys information to the brain. Brief versions of these tests may be done at birth to screen for hearing loss.



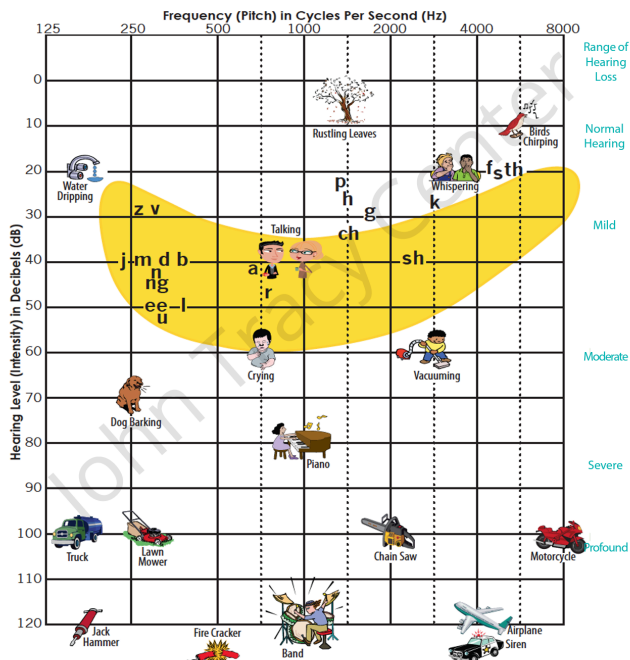
A comprehensive ABR evaluation for diagnosis of hearing can take up to three hours and is completed by an audiologist. The child must be sleeping naturally or with special medication. Small earphones and soft sensors record how sound travels to the brain. Results help determine if there is a hearing loss and what type it is. Subjective tests are behavioral tests used when children can respond to sound in specific ways. Behavioral tests are done with headphones or speakers in a sound booth (sound treated room). They include:

- **Behavioral Observation Audiometry (BOA):** used with infants and children not ready to clearly turn toward sound. Their eye blinks, eye widening, startle responses and other reactions to sound are observed.

- **Visual Reinforcement Audiometry (VRA):** used with toddlers and children able to be taught to turn in the direction of sound. When a child turns toward a sound, then a toy moves or video plays to make this a fun task

- **Conditioned Play Audiometry (CPA):** used with preschool and older children. The child is taught how to play a game of putting an object in a container every time they hear a sound.

- **Audiometry and Speech Recognition:** used with children who can raise their hand when they hear sound in a testing booth. The child listens to a variety of tones and speech played through headphones one ear at a time.



Adapted from American Academy of Audiology, www.audiology.org and Northern, J. & Downs, M. (2002). Audiogram of familiar sounds; and Ling, D. & Ling, A. (1978). Aural Habilitation.

See JTC's [Audiogram of Familiar Sounds](#)

## Audiograms

The results from behavioral testing are marked on a graph called an audiogram. Left to right shows the pitches tested from low to high. Top to bottom shows the volume from very soft to loud. The sounds are measured in decibels abbreviated "dB". The softest sounds a child hears at each frequency are plotted on the graph. Degrees of hearing are measured from -10 to 120 dB that show the range from normal hearing to profound loss.

## Results

Objective and subjective tests measure the level and type of hearing. The degrees of hearing loss are categorized as mild, moderate, moderately-severe, severe and profound. Hearing loss in the outer or middle ear is called conductive and can be treated medically. A loss that occurs in the cochlea is called a sensory hearing loss. When the hearing nerve (VIII cranial nerve) is not transmitting sound well, that is a neural hearing loss. Both sensory and neural hearing loss are permanent. Hearing aids or cochlear implants may be considered for sensory and neural losses to improve access to sound and speech.

## Next Steps

Children with hearing loss under age two should have regular evaluations every 3-6 months to monitor their hearing levels. From 2 to 8 years children with hearing loss should have their hearing evaluated every 6 months. Children without hearing loss may have regular hearing screenings as part of health check-ups. Screenings can also occur anytime parents feel concern about their child's responses to sound.

Audiologists may see a child more than once to evaluate the ear, auditory system, and hearing levels. Results of hearing tests begin a learning process for parents. Families may have minimal experience with hearing loss and have many questions. Parents often ask about hearing levels, hearing aids, cochlear implants, talking and development. Language is impacted by hearing loss. There will be choices to consider for communication, family support and early education.

Parents might meet with audiologists, educators, or other providers to explore services for their child's language and learning. Early intervention and family support programs assist with communication development. Other parents, individuals with hearing loss and community services can guide parents in advocating for their children. There are no limits to what children with hearing loss can achieve. Understanding hearing test results is the starting point for parents to become informed decision makers!

## Learn by Asking

Parents have the right to understand hearing testing and learn more. Families can request extra time or another meeting to discuss results. Listing concerns or bringing another person to an appointment can be helpful.

Examples of what parents ask are:

- Can you explain results?
- What are listening devices?
- Where do we get copies of reports?
- How do children with hearing loss communicate?
- What additional tests or appointments are needed?
- Who can we contact for more information and support?
- Where can we observe or obtain services for our child?
- What suggestions or advice do you have for our family?
- Are there health concerns related to hearing loss that must be checked?
- How can we meet other parents and individuals with hearing loss?