

# UNDERSTANDING HEARING LOSS: EVALUATION AND DIAGNOSIS

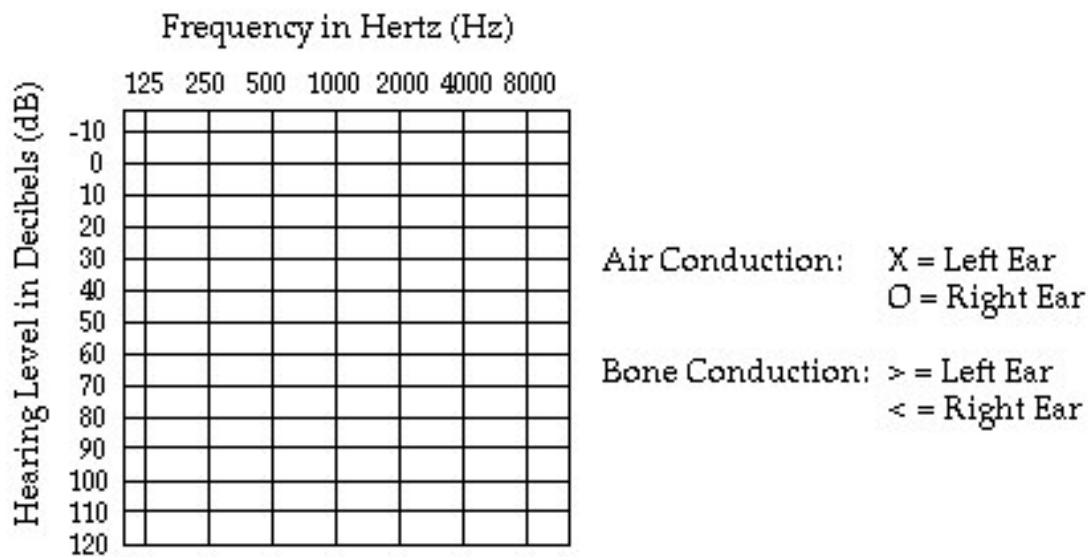
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For Families of Children with Hearing Loss

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When a hearing loss is first diagnosed, the test results may seem confusing. Although hearing loss is often described as a percentage, it is too complex to describe with one number. Remember, also, that determining how your child uses, or will use, his or her residual hearing is a process. This cannot be completely assessed by a single visit to the audiologist nor can it be completely assessed by any one hearing test. For these reasons, this section attempts to answer some of the most commonly asked questions about hearing loss evaluation and hearing tests.

## What Is An Audiogram And What Does It Tell Me?

**Audiologists** are professionals who specialize in evaluating hearing loss and conduct hearing tests. The results from the tests are recorded on an **audiogram**. An audiogram is a graph showing hearing sensitivity.

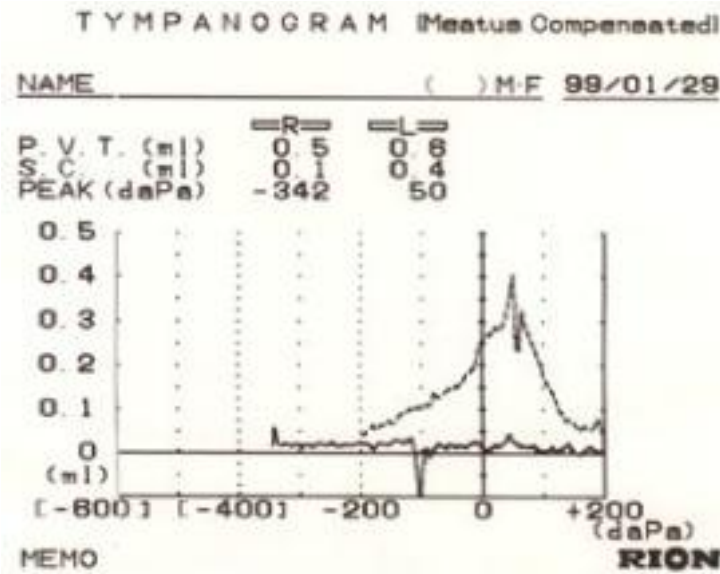


The **degree** of hearing loss is determined by measuring **hearing threshold**, the levels in **decibels** (dB) at which a signal is just barely heard. The louder sounds must be made to be heard, the greater the degree of hearing loss. Zero is a very soft sound and 120dB is a very loud sound. Thresholds are measured at several **frequencies** (itches) and graphed on the audiogram. The frequencies tested are those important for hearing and understanding speech and other environmental sounds. Frequency is noted in **Hertz** (Hz) with 250 Hz being a low pitch sound and 8000 Hz being a high pitch sound. The ears are tested via air conduction (through the ear canal) and via bone conduction (bypassing the ear canal and directly stimulating the hearing nerve).

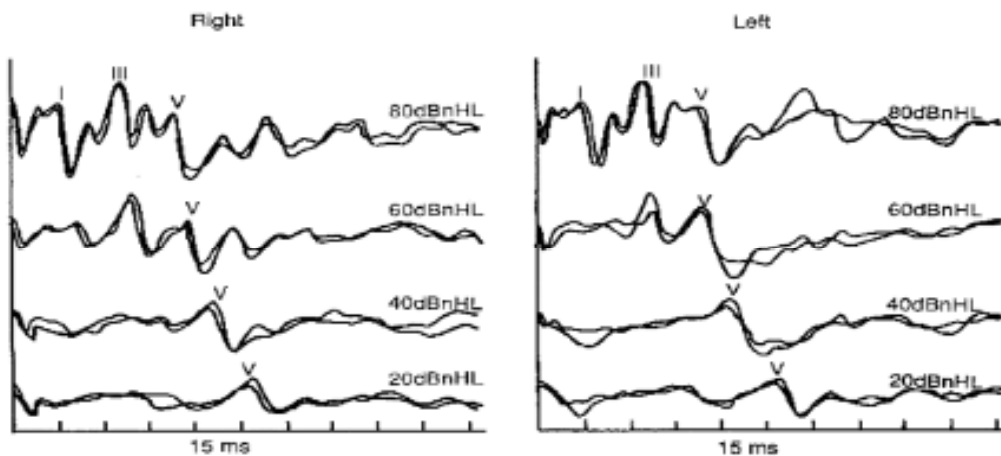
## How Is Hearing Tested In Young Children?

Special test methods are used with infants, toddlers and young children.

1. Often a test called a **typanogram** is performed to see if there is any evidence of middle ear problems that can contribute to hearing loss. A small probe is placed in the child's ear and the pressure in the ear canal is changed slightly to test for eardrum function.

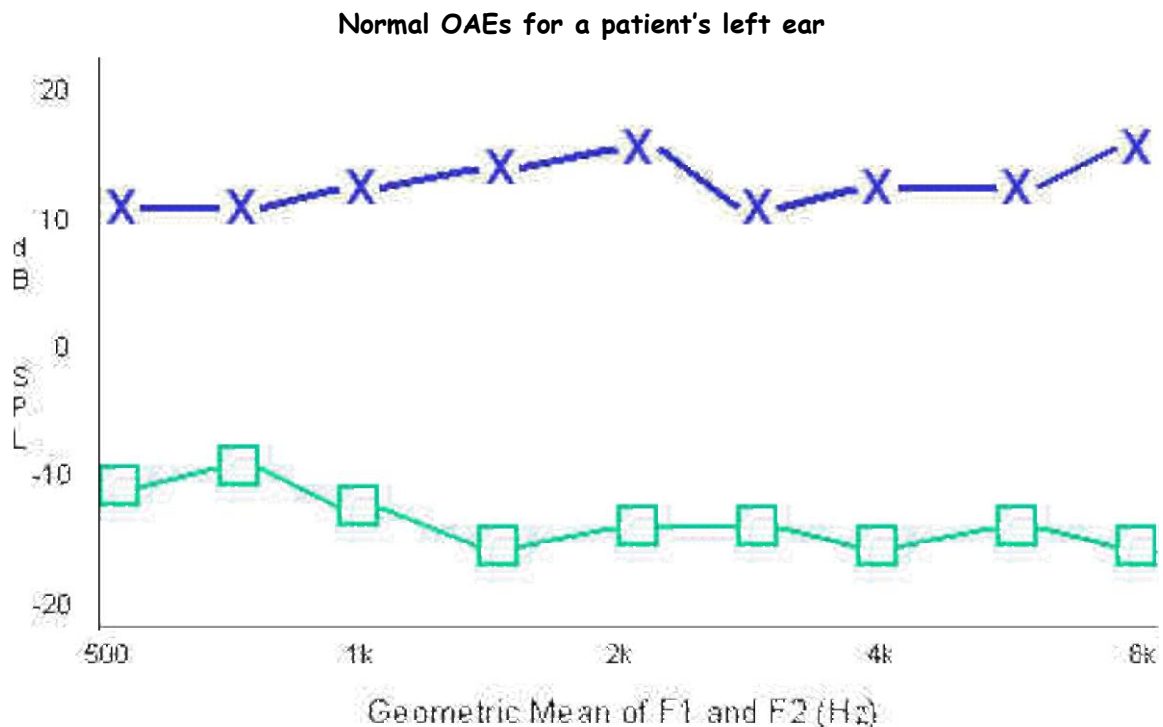


2. An **auditory brainstem response (ABR)** is one of the tests used to screen a newborn's hearing. It can be used on a child of any age. The ABR determines how the brain responds to sound. The test is performed while the child is sleeping. Electrodes are placed on specific spots on the child's head. Sounds are presented to the ear through headphones or insert earphones. Responses to the sound are used to determine if there is a hearing loss and/or the degree of hearing loss for the frequencies 2000-4000 Hz.



Auditory Brainstem Response testing on a normally-hearing individual.

3. Another method of testing hearing is **otoacoustic emissions (OAE)**. This test measures the cochlea's response to sound. Sound is presented in the ear via a small probe and a tiny microphone measures the response from the cochlea. The presence of OAEs indicates a normal functioning cochlea. OAEs are absent when there is a conductive hearing loss or a sensorineural hearing loss greater than 40 dBHL. A child needs to be to very still and quiet to get an accurate OAE result.



4. Behavioral testing: After six months of age, infants, toddlers and older children may be tested with game-like activities such as **Visual Reinforcement Audiometry (VRA)** or **Conditioned Play Audiometry (CPA)**. For VRA, the child responds to sounds by looking toward the speaker the sound came from and he/she is reinforced with a lighted toy. For this method, a child's responses to sounds are observed by the audiologist. In play audiometry, the child will drop a ball in a bucket or place a peg in a pegboard when he/she hears the sound. An older child may press a button or raise a hand in response to sounds.

#### **Is It Necessary To Repeat Hearing Tests?**

**YES!**

For conductive hearing loss, hearing should be retested after medical or surgical treatment. If no treatment is recommended, then the hearing should be retested regularly to monitor the stability of the hearing loss.

For sensorineural hearing loss, the audiologist or physician will recommend when repeat testing should be done. Since hearing can change at any time, it is important to detect this as early as possible and to obtain medical treatment if needed. Also, changes in hearing may require changes in hearing aids or hearing aid settings.