Fact Sheet

When Should A Child Be Referred For A Hearing Test?

Hopefully your child was born at a hospital that had newborn hearing screening available and testing would be done as a routine check in the newborn period.

If not, or if you still have concerns about your child's responses to sound, these are some conditions that suggest a child might be at risk for hearing loss:

- ~ family history of hearing loss in childhood
- ~ maternal infections during pregnancy
- ~ breathing difficulty at birth
- ~ visible malformations of the head, neck or ears
- ~ very low birth weight (less than 1500 grams)
- ~ meningitis
- ~ jaundice
- ~ medications which cause hearing loss
- ~ other medical conditions associated with hearing loss
- ~ stay in a special care nursery for longer than 3 days
- ~ prolonged mechanical ventilation lasting longer than 5 days

If your child comes under one of these categories, they should have their hearing tested before three months of age.

For older children, a referral should be made for a hearing test as soon as one of the following conditions arises:

- ~ parental/caregiver/teacher concern regarding hearing, speech-language and/or developmental delay
- ~ following meningitis, scarlet fever, mumps or other illnesses associated with high fever
- ~ head injury with loss of consciousness or skull fracture
- ~ diagnosis of a medical condition associated with hearing loss or neurodegenerative disorder
- ~ exposure to medication toxic to the middle ear
- ~ repeated or constant ear infections
- ~ trauma to the ear

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How Do You Test Hearing In Young Children?

Depending on the age of the child and the concerns expressed, a number of tests are available. No child is too young to test.

~ **Otoacoustic Emissions (OAE):**
A small probe is placed in the child's outer ear and a quiet clicking sound is presented. When the inner is stimulated a sound can be measured coming from the inner ear (cochlea). When this sound is recorded we know the cochlea is functioning and the child's hearing will be roughly within normal limits. If this sound cannot be recorded the cause of the loss has not been determined. Further testing or re-testing at a later time will be necessary to determine if the loss is temporary (conductive) or permanent (sensorineural).

This test is of benefit for children who are too young or too ill to give reliable responses to sound, yet determination of hearing ability is necessary. It is a very quick and harmless test which is frequently used in hearing screening programs for the earliest detection of hearing loss.

~ **Auditory Brainstem Response (ABR):**
Small (non-invasive) electrodes are placed on the child's head to monitor ongoing electrical activity from the child's scalp. A quiet clicking sound is introduced through earphones (which may either cover the ear or be placed in the ear canal). A computer then analyzes the changes in electrical activity to determine if the sound has been detected at a level loud enough to cause a change in electrical activity. Through this process, different pitches can be tested at different loudness levels to help determine level of hearing and type of loss.

This test is also of benefit for those children too young to respond to routine testing. An automated version of this test is useful for newborn hearing screening programs.

~ **Behavioral Audiometry:**
This is the most common form of testing children. Age, physical abilities and developmental levels will determine which test procedures are used.

~ **Behavioral Observation Audiometry (BOA):**
Generally this is used with very young children, < 6 months, or children with limited physical movement. The child is seated in a sound-treated room. They are presented with sounds of varying pitch and loudness. The audiologist watches the child for obvious changes in behavior to indicate that they have heard the sound. Expected responses can be as subtle as an eye widening or as obvious as a startle or localization to the source.

~ **Visual Reinforcement Audiometry (VRA) or Conditioned Orientation Response (COR):**
Generally used with children 6-30 months of age. The child is seated in a sound-treated room and presented with sound of varying pitch and loudness. The expected response is localization to the sound source. When the child responds they are reinforced with a visual distracter.

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~ **Play Audiometry:**
Generally used with children 2 1/2 - 4 years or age. At this age the child is able to make a game of listening. When they hear a sound they are able to pair the sound with an activity in a game; i.e., fill a bucket with blocks, build a tower with stacking blocks, etc. Again the sound varies in pitch and loudness to determine the child's ability to hear.

At 4-5 years of age a child is generally able to be tested in the same manner as an adult. That is, they are presented with sounds of varying pitch and loudness and respond by either raising their hand or pressing a button to indicate when the sound is heard.

For all of these behavioral tests, the child can be tested wearing earphones or through speakers in a sound-treated room. The use of earphones is preferred because you are better able to measure the hearing in both ears separately and test to a lower level.

~ **Immitance Testing:**
Generally, immittance audiometry is used with other testing procedures to determine or confirm the presence of outer or middle ear problems. A small probe is placed snugly in the child's ear and a slight pressure is introduced. As the pressure is changed in the ear canal we are able to monitor changes in the movement of the eardrum. Through this we are able to determine if the ear canal is clear, if the middle ear is clear, if the eardrum is whole, and if the middle ear bones are moving normally.

This is an important test to identify conductive hearing loss. It is frequently used to monitor middle ear status for children with recurring middle ear fluid or to test if pressure-equalizing tubes are functioning. It does not test hearing sensitivity.