Questions and Answers for Parents

There are simple, inexpensive tests available to detect hearing impairment in infants during the first days of life. In the past, most hearing deficits in children were not identified until the age of 2 or 3 years. It is no longer necessary to wait until a child is "old enough" for a hearing test. Infants who are diagnosed with hearing loss early and have treatment started by the age of 6 months have markedly better outcomes than children who are diagnosed later in infancy or childhood.

Why is it important to screen my baby's hearing?

Approximately one to three babies out of 1,000 will be born with permanent hearing loss. Babies start to learn language and speech very early. By their first birthday, they are already learning what words mean and babble many of the sounds they hear. If a hearing loss is not detected early, a baby will miss a very critical period for speech and language development. Delays in speech and language can lead to other problems when the child goes to school. Finding hearing loss and getting treatment early can help prevent these delays.

Hospitals screen for several things when babies are born, such as PKU (this is an abbreviation for Phenylketonuria, a disorder in which children are not able to metabolize part of protein in food). Hearing loss occurs more often in babies than any of the other things that are screened for at birth. Hospitals in North Carolina screen all babies for hearing loss before discharge.

How does newborn hearing screening work?

There are two tests which may be used to screen a baby's hearing. Both are comfortable and pose no risk for babies.

Auditory Brainstem Response
Soft clicking sounds are played through earphones into the baby's ears. Band-aid like sensors placed on the baby's head measure the brain's response to these soft sounds. The machine compares the response from the baby being tested to a "normal" response for babies. If there is a good match, the baby passes the screening. If the match is not close enough, the baby refers on the screening.

Otoacoustic Emissions
Soft beeping or clicking sounds are played into the baby's ear through a small earphone which also has a microphone in it. If the baby passes the OAE, the microphone measures a response in the ear canal like an "echo". When a baby has hearing loss, no echo is measured and the result is a refer.

These tests may be used alone or in combination. Both tests are accurate and reliable. Both tests are accurate and reliable. Some hospitals use a 2-step process. Babies are first screened with OAE, and those who do not pass the OAE are then given the ABR

test. Each hospital has chosen a screening method based on the hospital's resources, available personnel, costs, and number of babies born in that hospital.

Will the screening hurt my baby?

No. The screening is easy and painless. Most babies sleep through the test. The screening can take as little as one minute, or as long as 30 minutes, depending on how quiet the baby remains during the test.

What if I don't want my baby's hearing screened?

Though it is recommended all babies have this screening, you may choose not to have your baby screened. If you do not want your baby's hearing to be screened, please tell your nurse. You will be asked to sign a non-consent form stating that you were offered the screening and chose not to have the test done. You will be contacted later on by public health staff and offered another opportunity for your baby's hearing to be checked.

What does it mean if my baby passes the screening?

This means that on the day of the screening, your baby's hearing was good enough for speech/language development. No further testing is necessary at this time.

Hearing loss can develop at any age, so it's important for you to watch your child's hearing health and speech/language development by using the Hearing Health Checklist. If you have any concerns regarding your child's hearing, speech, or language you should talk to your child's doctor.

Can a baby pass the screening and still have hearing loss?

Sometimes, though it doesn't happen very often. Some mild hearing losses or hearing loss that affects only some pitches of sound will not be picked up by the screening test. Hearing loss can develop at any age. The infant may not have hearing loss at birth, but develop a hearing loss after the newborn period.

There are several risk indicators for hearing loss. If your child has any of these risk factors or you have concerns about your child's responses to sounds or speech/language, you should talk to your child's doctor.

What does it mean if my baby REFERS (does not pass) the screening?

It means that the screening needs to be repeated within 30 days. Nationwide, 2 percent to 20 percent of babies will refer on the first screening. Less than 1 percent will actually have permanent hearing loss.

You may ask why would a baby with normal hearing refer on the newborn hearing screening. There are several common reasons: fluid in the middle ear, vernix in the ear canal, too much movement/crying during the test, etc.

Even though most babies will pass the repeat screening, it is VERY important to take your baby for this testing. It's the best way for you to be sure about your baby's hearing.

What do I need to do next if my baby refers (does not pass) on the screening?

The first step is to take your baby for a repeat screening within 2 to 4 weeks. You may also want to discuss the results with your baby's doctor.

What if my baby refers (does not pass) on the repeat screening?

Your baby needs to have a diagnostic audiology evaluation to determine how much**,** if any, hearing loss is present in each of your baby's ears. This diagnostic evaluation should happen before your child is 3 months old. Your doctor should refer you to a pediatric audiologist for this evaluation.

Can my child's hearing be tested at any age?

Yes. There are safe, accurate, and effective ways to determine how well your child hears at any age. Pediatric audiologists are trained to test hearing on children of all ages.

When should a diagnostic audiological evaluation be performed?

Infants should be referred for diagnostic audiological evaluation following a "refer" result on two hearing screenings (i.e. initial newborn hearing screening and one follow-up re-screening), which should occur before the age of 1 month. The diagnostic audiological evaluation should be completed by the age of 3 months.

Diagnostic audiology evaluations are appropriate at any age, if concerns about hearing arise. It is important that the diagnostic evaluation be completed as soon as possible following a refer result on a hearing screening.

Who should complete the diagnostic audiological evaluation?

The diagnostic audiological evaluation should be completed by a ***pediatric*** audiologist. A pediatric audiologist is trained, has the technical expertise, and desire to work with the infant population. The pediatric audiologist is well-versed in developmentally appropriate test techniques, general child development, and parent counseling.

In the absence of a specialized certification for pediatric audiology, practitioners are expected to follow their professional code of ethics regarding their capability to provide

such services. ***If the practitioner does not have the expertise and equipment to follow recommended protocols, the infant and family should be referred to a professional equipped for and qualified in infant audiologic assessment.***

Audiologists who provide the audiologic assessment must hold a current license in Audiology issued by the North Carolina Board of Examiners for Speech and Language Pathologists and Audiologists.

Where should the diagnostic audiological evaluation be provided?

The diagnostic audiological evaluation should be completed in an audiology setting where audiologic and otologic (ENT) services are well coordinated. Sedation or anesthesia may be required to complete the diagnostic audiological evaluation, especially if your child is over 2 months of age.

When sedation (or anesthesia) is required, the evaluation should take place in a setting with appropriate medical support. It may be possible to conduct the diagnostic audiological evaluation in conjunction with other procedures where the child will be sedated (i.e. surgery, CT scan, MRI, etc.).

Why would sedation be needed?

Part of the test needs to be completed while your baby is sleeping. The test can take 1 to 2 hours. Children older than 2 months are not likely to sleep naturally long enough for the testing to be completed.

What kinds of tests should be included in the diagnostic audiology evaluation?

Your baby's entire auditory (ear) system should be evaluated. This includes the outer, middle, and inner ear as well as the auditory nerve. A complete diagnostic audiology evaluation for an infant/child should include:

For all ages:
Otoscopy – The audiologist will view your baby's ear, ear canal, and eardrum with an otoscope

Tympanometry – This is used to determine middle ear function. The test places a small earphone in the baby's ear canal, gently changes the air pressure in the ear, and measures how much the eardrum moves. It is helpful in finding the presence of fluid and/or infection in the middle ear.

Middle Ear Muscle Reflex – There is a tiny muscle in the middle ear that will "jump" in response to loud sound in normal hearing ears. This is similar to when your doctor taps you on your knee and the knee jerks. This gives more information about type of hearing loss.

Diagnostic Otoacoustic Emissions (OAEs) - Soft beeping or clicking sounds are played into the baby's ear through a small earphone which also has a microphone in it. The microphone measures a response in the ear canal like an "echo". This information can help define the type of hearing loss.

AND

For birth to 6 months:
Auditory Brainstem Response (ABR) – This is similar to the screening ABR, but gives much more information about the degree and type of hearing loss across different frequencies (pitches) in each ear. Your baby will need to sleep for this test. Click below to see an example of a normal ABR.

http://www.babyhearing.org/hearingamplification/hearingloss/testsexpect.asp

For Infants and Toddlers (6 months-24 months):
Visual Reinforcement Audiometry – Sound is presented either through earphones or through a loudspeaker. The child is trained to turn his/her head in response to sound by the use of an animated toy or video. It is important that each ear be tested. This gives information about what your child hears in each ear for many different frequencies (pitches).

For Young Children and Preschoolers:
Conditioned Play Audiometry – This is like playing a game. Your child will wear earphones and will hear sounds through the earphones. They will be asked to do a specific task, like dropping a block in a bucket, every time they hear a sound. It is important that each ear be tested. This gives information about what your child hears in each ear for many different frequencies (pitches).

Does insurance cover the cost of the diagnostic audiological evaluation?

Many insurance companies do cover this evaluation, providing you get the appropriate referral from your primary care physician. However, you will need to consult your insurance carrier for this information.

When should an infant be fitted with amplification?

It is recommended that infants with confirmed hearing loss be fitted with amplification and enrolled in appropriate early intervention services as soon as possible, but no later than the age of 6 months. In cases where the hearing loss does not present until after 6 months (i.e. late onset hearing loss), amplification should be fitted and enrollment in early intervention services should take place as soon as possible.

Who should complete the fitting of amplification for infants?

An audiologist is the professional singularly qualified to select and fit all forms of amplification for children (personal hearing aids, FM systems, cochlear implants, and other assistive listening devices). Audiologists working with young children must have experience with amplification and management of infants and children with hearing loss and have the test equipment necessary to complete all described testing for hearing aid selection and evaluation procedures. ***If the practitioner does not have the expertise and equipment to follow recommended protocols, the infant and family should be referred to a professional equipped for and qualified in infant hearing aid (amplification) fitting.***

When does a child need amplification?

Amplification should be considered for children who have:

(1) confirmed permanent bilateral hearing loss of any degree (sensorineural, conductive, or mixed); or

(2) confirmed permanent unilateral hearing loss in a portion of the frequency range critical for speech understanding with measurable hearing in the affected ear as measured by ABR and behavioral testing, taking into account the "special considerations" listed below; and

(3) received written medical clearance for amplification use from an otologist, pediatric otolaryngologist, or a general otolaryngologist.

What are special considerations in determining candidacy for amplification?

1) *Middle ear conditions*

2) *Other health concerns*

3) *Unilateral hearing loss* (American Academy of Audiology, 2004)

"Use of hearing aid amplification is indicated for some children with unilateral hearing losses. The decision to fit a child with a unilateral hearing loss should be made on an individual basis, taking into consideration the child's or family's preference as well as audiologic, developmental, communication, and educational factors. Amplification options such as personal FM systems also should be considered. Use of communication strategies (noise reduction, positioning, etc.) may prove to be beneficial and easily accomplished for the infant or toddler with unilateral hearing impairment. The use of

Contralateral Routing of Signal (CROS) amplification requires particular care. Its design is to overcome the problem caused by the head shadow effect. This could be especially helpful in a quiet environment and when the signal of interest originates from the direction of the non-functioning ear. However, one recent study indicated that CROS amplification may not be beneficial for children in a classroom setting, because of the introduction of additional noise to the normal-hearing ear."

4) *Minimal-mild hearing loss* (American Academy of Audiology, 2004)

"Current evidence suggests that children with minimal and mild hearing losses are at high risk for experiencing academic difficulty. As such, children with minimal and mild hearing loss should be considered candidates for amplification and/or personal FM system or soundfield systems (FM) for use in school."

5) *Profound hearing loss* (American Academy of Audiology, 2004)

"A finding of no response by ABR should not exclude a child from hearing aid candidacy, as residual hearing may exist at intensity levels greater than those capable of eliciting a standard ABR response. Children with confirmed profound hearing loss still may experience benefit from hearing aid amplification. An infant or child with severe to profound hearing loss is a cochlear implant candidate."

6) *Normal peripheral hearing sensitivity* (American Academy of Audiology, 2004)

"In some cases, children with normal peripheral hearing sensitivity may benefit from amplification. These cases may include children with auditory processing disorders (APD), auditory neuropathy (AN) or dysynchrony, and children with unilateral hearing impairment when an FM system is coupled to the normal-hearing ear. In such cases, close audiologic monitoring of hearing sensitivity, and careful control of the output of the amplification is required."

How is a hearing aid fitted and evaluated on an infant or young child?

The process for fitting hearing aids on infants/young children is very different than it is for adults. It is necessary for a qualified pediatric audiologist to complete hearing aid fittings on infants/young children. Because a child's early years are critical to speech/language development, it is important to find the best hearing aids for each child.

Hearing aids must be fit individually for each child using the test results obtained during the diagnostic audiological evaluation. Infants cannot tell us how well the hearing aids are working, so it is vital that we have accurate test results when fitting hearing aids to these tiny ears.

Sound is much louder in small spaces than in large spaces. So, sound coming from the hearing aid will be louder for your infant than it would be for an adult. It is important to know how much sound is present in your child's ear. A special probe microphone measure, called the Real-Ear-to-Coupler-Difference (RECD), can be used. The audiologist will combine the RECD with the response of the hearing aid in a special test box to find the best hearing aid and settings for your child. The most important goal when fitting hearing aids to young children is to make speech loud enough for the child to hear.

Does insurance pay for hearing aids?

This depends on your insurance. Please contact your insurance company to find out what coverage you may have. You may also contact the CSHS Helpline at 1-800-737-3028 for more information.

In North Carolina, there is funding available for the initial hearing aids for any child under the age of 3 years through a program called EHDI Initial Hearing Aids. There are no income requirements to receive this funding. If you have other insurance, that insurance must be contacted first.

What type of hearing aid should my child have?

For many reasons, behind-the-ear hearing aids are preferred for young children. However, there are other considerations you will need to discuss with your audiologist. There are several features available and you will need to work with your audiologist to find the best combination for you and your child.