

Listen Up

Newborn hearing screening focuses on identifying hearing loss early. Catching problems sooner rather than later can make a big difference in a child's development.

By Tiffani Hill-Patterson

Do you hear the crickets chirping? Your computer whirring? Your own breathing?

Every day, 33 children are born with hearing loss, making it the most common congenital condition in the United States. For many of these babies, the everyday sounds many of us take for granted go unheard. According to the American Academy of Pediatrics (AAP), 1 to 3 of every 1,000 newborns has some degree of hearing impairment. And 95 percent of babies with hearing loss are born to hearing parents.

In 2001, my daughter was included in those statistics. Unfortunately, my husband and I, like most first-time parents, were so consumed with changing diapers, checking baby's breathing, and challenging the notion that we needed sleep that we barely considered whether Riley was listening. We didn't consider screening her for hearing issues as seriously as we should have, and it wasn't until she was 18 months old that we learned she was profoundly deaf.

The AAP promotes universal newborn hearing screening, which aims to diagnose hearing impairments in babies by the age of 3 months, says Betty Vohr, M.D., FAAP, professor of pediatrics at Brown University School of Medicine and director of the Neonatal Follow-up Clinic at Women's & Infants' Hospital in Rhode Island.

Why so early?

Studies have shown that important language skills are learned before the age of 3 because hearing and learning



language are closely tied together. "This is a very critical time period during which infants can acquire language," says Dr. Vohr, a member of AAP's Task Force on Improving the Effectiveness of Newborn Hearing Screening, Diagnosis and Intervention. "Brain development of the auditory pathways and language cortex is occurring in young children as they respond to auditory and visual language. In families that are part of the deaf culture, these parents automatically sign from day one, so the baby is learning visual (sign) language, and the appropriate brain development is occurring."

However, if a child has an undiagnosed hearing impairment and the parents are unaware, the child will not receive the needed language stimulation — and the hoped-for development won't take place. "The brain is like a huge computer," Dr. Vohr says. "The more age-appropriate sensory input a child receives, the greater the development of complex brain connections and language skills. So it's very important that a child have access to language very early."

Susan E. Wiley, M.D., FAAP, is a developmental pediatrician and adjunct associate professor at Cincinnati Children's Hospital Medical Center. "The most important reason for early detection is so we can understand how to help a child's language and communication growth," Dr. Wiley says. "We want to do this immediately, in order to prevent language delays and the child's resulting frustrations with communication and social-emotional growth."

This won't hurt a bit

Thanks to the Early Hearing Detection and Intervention program (EHDI), 94 percent of newborns have their hearing screened, Dr. Vohr says, citing the most recent data from the U.S. Centers for Disease Control and Prevention.

"States have newborn hearing screening in almost all hospitals," explains Dr. Wiley, who is also an AAP Task Force on Hearing member. "Before they leave the hospital, babies will get a hearing screen that gives some idea whether or not they might have a hearing problem."

While the screening can vary from one hospital to the next, one of two methods is used to check for potential problems: otoacoustic emissions (OAE) and auditory brainstem response (ABR). Rest assured that a hearing screening will not cause your baby any pain and can easily be done while the baby sleeps.

"Neither requires behavioral response from the infant, which was a big breakthrough for hearing screening," Dr. Vohr says. "Prior to the development of these tests, noisemakers were used and the baby's reaction or change in heart rate was recorded. These screening methods lacked both sensitivity and specificity."

With OAE, a small probe is placed in the baby's ear, sounds are transmitted into the probe, and the response of the outer hair cells of the cochlea (nerve pathways from the inner ear to the brain) is measured. In a screening using ABR, sticky electrodes are placed on the infant's scalp, sound is transmitted into the ear, and the child's brain wave responses to the sounds are measured.

"Neither of these tests hurts, and they're simple to do," Dr. Wiley says. "They're pretty quick, and the baby doesn't have to be particularly cooperative."

Finding potential problems

A second check is necessary if a screening uncovers a possible problem. However, that doesn't necessarily mean there is a permanent hearing loss. "There are a lot of reasons a baby may not pass a screen and still have normal hearing," Dr. Wiley says. "Some of these reasons include fluid in the ear canal, a wiggly baby, a poorly fitting ear probe, a noisy testing environment, or an inexperienced staff person who is conducting the screening."

If the second screen also suggests a problem, "Your child needs to be seen as soon as possible by a qualified audiologist who has experience with infants and children," Dr. Vohr stresses. "Most states will have referral lists for audiologists skilled in assessing young infants. Your state EHDI coordinator can also provide you with information on your next steps."

Diagnosis and treatment

Once your audiologist confirms hearing loss, he or she will refer you to your state's Early Intervention program, a federally mandated program that helps families of children at risk for development delays.

"Also, as part of that assessment the baby will be seen by an otolaryngologist," Dr. Vohr says. "The otolaryngologist will determine if anatomically the baby is a candidate for hearing aids or another type of device such as a bone conduction hearing aid. This consultation is an important part of the work-up."

The treatment will depend on the type of hearing loss:

- **Conductive:** The sound to the inner ear is blocked by something, such as fluid, wax, or a foreign object.
- **Sensorineural:** The cochlea are damaged.
- **Mixed:** A combination of both conductive and sensorineural loss.
- **Auditory neuropathy:** A relatively new diagnosis — the outer ear, middle ear, and cochlea are intact, but the sound transmission to the brain is impaired.

"You have to take a lot of things into consideration when choosing your communication strategy," Dr. Wiley says. "Any approach is going to take a lot of energy and effort because you're doing things differently than you would for a hearing child. It's a whole new journey."

The Earlier, the Better

A newborn hearing screen is the first step toward ensuring your baby will be able to learn language and communicate effectively.

"By having early identification, we're not waiting until the child is a frustrated 2-year-old who can't communicate well. Families have less pressure to do something fast," Dr. Wiley says. "They don't feel like they are behind, and they can figure out what communication choice makes sense for their child without feeling like they're having to make up for lost time."

Trying to help a frustrated 2-year-old catch up on language skills distresses everyone. Fortunately, with bilateral cochlear implants and lots of intense therapy, my daughter's communication skills are now on par with her second-grade peers. She is a normal 7-year-old who loves dolls, soccer, dancing, reading, and riding her bike, and she does it all with colorful ear accessories. However, if we had paid attention sooner, our path might have been easier.

Dr. Vohr says, "We're living through a period of enhanced optimism about children with hearing loss. We've seen the incredible differences made by early identification and early amplification, and I think the opportunities for children with hearing loss, no matter which mode of communication is used, will continue to improve. I think that in 2009 both parents and professionals can have a very positive outlook for children screened and identified early."

"It is the goal of the AAP that every infant be screened for hearing loss as a newborn, diagnosed by 3 months and receive Early Intervention services by 6 months of age." •