

Pediatric Hearing Screening in the Medical Home: A Model Program

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Deafness is the most common disability present at birth. In the United States, approximately one in 300 infants is born with permanent hearing loss. We have long known that diagnosis in early infancy and intervention within the first few months of life can prevent the tragic consequences of limited communication, low school achievement and life-long dependency that can result from delayed detection of childhood deafness (Yoshinaga-Itano, 1995). Additionally, diagnosing these children early can trigger a closer look at medical conditions sometimes linked with deafness, such as heart arrhythmia and vision and kidney problems. Indeed, researchers in the field agree that no group has more to gain from early identification than children with hearing loss (Joint Committee on Infant Hearing, 2000).

Until the last few years, the average age of diagnosis for hearing loss was 30 months. Advances in technology have now made it feasible to screen babies at birth using objective physiologic measures, and Newborn Hearing Screening Programs of the country in the percentage of newborns screened, has recently passed legislation (AB 2651) to try to address this gap. However, follow-up, including re-screening, comprehensive diagnosis and timely entry into early intervention programs, has proven to be a major hurdle throughout the nation. In some states, up to 50% of infants who fail their hospital screening are lost to follow-up (White, 2005), a situation that disproportionately affects low-income and chronically underserved families.

One such family was enrolled in John Tracy Clinic's Parent/Infant Program in fall 2004. Although the toddler, named Fátima, had failed a newborn screening two years earlier at a California hospital, she had not received appropriate referrals or diagnostic follow-up and was seriously delayed in auditory, speech and language development. She became a patient at a local clinic soon after her hearing loss diagnosis at age 18 months. Based on the diagnosis, her pediatrician had referred Fátima for the recommended screenings for associated medical conditions. A cardiologist diagnosed Long QT Syndrome, a potentially life-threatening heart condition that might have been detected earlier if Fatima's



This page photos clockwise from top: No group has more to gain from early intervention than children with hearing loss. Zain, identified at birth, was fitted with hearing aids at 10 weeks;

Parents of children identified through Baby Sound Check are invited to join John Tracy Clinic's free Parent/Infant Program, where they receive expert educational, psychological and audiological support. Children who fail an OAE screening are referred to an audiologist for comprehensive diagnostic evaluation;



Cochlear implants, when accompanied by early education and parent guidance, can help the most profoundly deaf children acquire speech, language and social skills on par with their hearing peers;

Otoacoustic Emission (OAE) testing is a rapid, non-invasive hearing screening tool. Measured are echoes from the inner ear elicited by a sound.

Next page: John Tracy Clinic, founded by Louise and Spencer Tracy in 1942, is the largest private provider of services to families of children with hearing loss in the world.. Photos © John Tracy Clinic.



hearing loss had been diagnosed at birth. The pediatrician, Dr. Parul Bhatia, discovered that most of her patients were born in hospitals that were not mandated to give newborn hearing screenings. She wondered how many more children like Fátima might be in her practice, and contacted John Tracy Clinic (JTC) to explore ways of incorporating hearing screening into well-baby care at local clinics. In discussion with JTC audiologists, it became clear that such a plan would need to include both early and periodic screening in order to identify progressive and late-onset hearing losses, since severe hearing loss can occur after the newborn period. It is estimated that an additional two out of 300 children develop permanent hearing loss by the time they reach school age (Eiserman, W., 2006). The inclusion of periodic screening would also catch those children with chronic otitis media and unilateral or moderate losses, all of which can significantly impede a child's language and overall development.

This is the backdrop for the introduction of John Tracy Clinic's *Baby Sound Check*[™], a model program for integrating infant-toddler hearing screening into routine well-baby care in community health clinics. Conducting the screenings in the medical home will fill critical gaps in hospital-based screening, ensure prompt detection of late-onset and progressive losses, and enable the pediatric teams to monitor children's hearing health. Community clinics involved in the project provide a medical home in which preventive care and culturally sensitive and effective follow-up are standard practices. John Tracy Clinic, with 65 years of expertise in early childhood hearing loss and professional education, is ideally positioned to train medical assistants to do the screenings and to educate the physicians and other medical providers about interpretation of results, appropriate referrals, and above all, the importance of early identification of hearing loss.

Baby Sound Check is being developed by JTC in collaboration with Alta-Med Health Services, St. John's Well Child and Family Center, South Central Family Health Center and Venice Family Clinic. Dr. Bhatia, who provided the impetus for the project, is



its medical director. Dr. Bhatia is also on the faculty of USC's Keck School of Medicine and on staff at Children's Hospital Los Angeles. She and the authors will evaluate and disseminate the results of the program. Initially targeted are the underserved children ages birth to three years whose families seek medical care in these Los Angeles County health clinics. Major funding for the project has been provided by Everybody Loves Raymond's Monica and Philip Rosenthal.

The protocol calls for periodic screening at two weeks, six months, and annually thereafter, using Otoacoustic Emissions (OAE) and high-frequency Tympanometry. Data is also being collected on the presence or absence of Acoustic Reflexes as a possible means of ruling out Auditory Neuropathy. Medical Assistants conduct the screening and record results, and the physicians are trained to interpret them and make referrals as needed. Children who fail Tympanometry may have treatable middle ear conditions and are able to see their physicians immediately to receive medical care. Children who fail OAEs and pass Tympanometry are at a high risk for permanent hearing loss and referred to JTC for diagnostic Audiological evaluation using behavioral testing and Auditory Brainstem Response (ABR). Families with children found to have significant hearing loss are given guidance, information and appropriate referrals by JTC counselors and audiologists.

Parents of children identified through the program are assigned a case manager and are invited to join JTC's free Parent/Infant Program, where they receive expert educational, psychological and Audiological support, including the loan of hearing aids. Doing the screenings periodically ensures that children whose hearing losses develop over time, or who come into the program at an older age, are not missed. Ultimately, it is hoped that the medical staff will become so comfortable with the equipment that they will conduct screenings whenever there is concern about speech and language delay and/or middle ear problems.

Baby Sound Check's goals are to develop, implement and evaluate a model hearing screening program that will screen 10,000 underserved children over a three year period while developing sustainable capacity in local community healthcare providers. A start-up cost of \$100 per child, which includes all equipment, training and operating expenses of the model program, will diminish over time as each provider carries the program forward. Such a cost pales in comparison to the status quo. In the absence of infant screening and early intervention, the cost of educating one deaf child in special public programs through high school exceeds \$500,000 (Johnson, J. et al, 1993).

John Tracy Clinic, a 501(c)(3) charitable organization, was founded by Louise and Spencer Tracy in 1942 and named after their son, John, who was

born deaf. It is the largest private provider of services to families of children with hearing loss in the world. JTC offers a continuum of integrated services for families, ranging from audiological assessments, to counseling and parent/infant programs, to preschool and mainstream support. In collaboration with the University of San Diego, its online and on-campus accredited teacher education programs are helping to fill a nationwide shortage of qualified professionals in early childhood deaf education. The Clinic, located at 806 West Adams Boulevard, Los Angeles, CA 90007, also maintains a satellite facility in Long Beach at 740 East Wardlow Road. For more information, visit the Clinic's website at www.jtc.org, or call (213) 748-5481.

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