



# AUDIOLOGY INFORMATION SERIES



ASHA'S CONSUMER NEWSLETTER

## Early Hearing Detection and Intervention (EHDI) for Newborns and Infants



*Why is screening all babies' hearing during the birth admission hospital visit (known as universal newborn hearing screening) and identifying hearing loss as early as possible in a child's life so important?*

Humans by their very nature are different from other species because of a unique factor, our ability to communicate ideas and feelings. Research for many years has shown that babies start learning the language they hear from birth (and maybe even before birth) by listening to voices and sounds around them. Hearing loss interferes with access to human communication — language—essential for normal development.

Language is the foundation for all learning and social interaction. Without this early start, language development is delayed, affecting a child's ability to learn and develop social skills. Recent research strongly supports that children with hearing loss who are identified and receive appropriate intervention before age 6 months can develop language comparable to their hearing peer group.<sup>1,2</sup> This new finding is particularly compelling since a 30-year study found that at high school graduation, children

with hearing loss, on average, had a fourth-grade reading level.<sup>3</sup>

Early identification and access to quality habilitative services designed for children with hearing loss is the key to developing language and communication skills commensurate with the children's cognitive abilities. Early identification will provide the opportunity for improved outcomes for thousands of children with hearing loss.

*If identifying babies in the first few months of life is so critical, why the delay in universal newborn hearing screening (UNHS) program implementation nationwide?*

Several factors stymied the development of *early hearing detection and intervention programs* (EHDI), a term used to reflect the full continuum from screening (UNHS) to diagnostic evaluations and to linkage to intervention services:

- For three decades, careful study and resulting policy statements and recommendations from the national, consensus-building, multi-organizational committee, the Joint Committee on Infant Hearing (JCIH),<sup>4</sup> relied on data indicating that most babies would be identified through high-risk screening. Later research yielded evidence that only 50% of babies with hearing loss have identifiable *risk indicators*; i.e., symptoms or syndromes

known to be associated with congenital or acquired hearing loss.

- In addition, with the U.S. trend toward shorter hospital stays of mothers and newborns, it proved difficult to implement “high risk” screening in the Well Baby Nursery as well as in the Neonatal Intensive Care Units. High-risk screening necessitates obtaining a complete family history and medical findings to determine if risk indicators are present.
- Historically, convincing families and primary care physicians of the need for follow-up for full hearing evaluations of babies with high risk factors proved to be difficult.
- Concern based on related literature suggested that identifying babies with hearing loss early might disrupt the natural bonding process between parents and children.
- Finally, perhaps the primary obstacle to the development of universal newborn hearing screening programs was the lack of a valid, cost-effective, and rapid objective technique for screening the hearing of neonates before their discharge from the hospital. Now, efficient and low-cost screening technologies are available, making UNHS possible.

The combination of all of these factors influenced many state policymakers and individual birthing facility administrators to delay implementation of UNHS programs through the mid-to-late '90s until the present time.

Despite 1975 federal legislation (now known as the Individuals with Disabilities Education Act [IDEA] and reauthorized in 1999) that specifies the importance of early identification of and intervention for children with or suspect of a disability, children with severe-to-profound hearing loss on average were identified at 30 months. Children with mild and moderate losses often were not found until enrollment in school.<sup>5</sup>



*How many babies are born with hearing loss to make this EHDI initiative beneficial?*

Some recent studies that have examined the prevalence of hearing loss in young children who received newborn hearing screening found the prevalence of unilateral and bilateral hearing loss was approximately 2 to 3 per 1000.<sup>6,7</sup> Other findings, including those from the Centers for Disease Control and Prevention’s (CDC) study of school-age children from 3-10 years old, conclude that the prevalence of 1 to 2 per 1000 found in the early years of universal hearing screening probably underestimates prevalence of hearing loss and magnitude of delayed diagnosis. Variables affecting prevalence estimates include the criteria used to define serious hearing loss, the limited capacity of earlier screening technologies, and previously unreported children with mild, moderate, and/or unilateral hearing losses. Recent evidence also has shown that, for many years, children with minimal hearing loss, in addition to those with unilateral hearing loss who are identified late or lack appropriate intervention, have academic failure as well as learning and social-emotional difficulties, resulting in significant lifelong learning delays.<sup>8</sup>

Health and education professionals are urged by the Joint Committee on Infant Hearing 2000 policy (see below) to monitor children who may pass the screening at birth but are identified with risk indicators for delayed onset of and possible progressive hearing loss.

## ***Do national and state initiatives support early hearing detection and intervention programs?***

In 1993, the National Institutes of Health (NIH) held a consensus conference on Early Identification of Hearing Impairment in Infants and Young Children that strongly recommended the establishment of universal newborn hearing screening.<sup>9</sup> NIH's report in combination with 1994 JCIH recommendations<sup>10</sup> that early hearing detection during the birth admission stay was the appropriate public health goal catapulted federal and state advocacy efforts to bring this goal to fruition.

The U.S. Public Health Service's Healthy People (HP) Year 2000 and newly-released Year 2010

initiatives that establish decade-long health objectives for the nation have targeted reducing the age of identification of hearing loss. For the first time, the U.S. Public Health Service's document includes a chapter on Vision and Hearing with specific national goals that urge periodic hearing screening<sup>11, 12</sup> and referrals for appropriate professional evaluation. Objective 28-11 in the HP 2010 chapter on Vision and Hearing states:

*Increase to 100% the proportion of newborns who are screened for hearing loss by 1 month of age, have diagnostic follow up by 3 months, and are enrolled in appropriate intervention services by 6 months.*



In 1999, federal funding was authorized to provide resources for three federal agencies—NIH, Centers for Disease Control and Prevention (CDC), and the Health Resources and Services Administration's Maternal and Child Health

Bureau—to conduct EHDI epidemiologic and applied research as well as to increase the establishment of more statewide programs. As of summer 2000, 33 states had passed mandates for EHDI programs, with other state



bill in development.<sup>13</sup> A JCIH 2000 position statement and guidelines document, endorsed as policy by national education and health professional organizations as well as consumer organizations, provides a detailed blueprint for the establishment of quality EHDI programs.<sup>14</sup> An enhanced standard of care, new technologies, evidence-based practices, and federal and state grassroots advocacy efforts have all combined to facilitate movement toward implementation of EHDI programs.

## ***What are the current issues about the cost of newborn and infant hearing screening and identification?***

- The cost and positive predictive value of universal newborn hearing screening compare favorably with the cost and predictive value of screening for other congenital conditions.<sup>15</sup>
- The prevalence of permanent congenital hearing loss at 260 per hundred thousand is substantially higher than the prevalence of PKU (7), hyperthyroidism (25), or hemoglobinopathy (13) that are required screening targets in every state. The cost of universal newborn hearing screening has been estimated from \$17 to \$33 per infant, depending on varying factors, such as, type(s) of technology used, number of births per hospital, and qualifications of personnel. Reported costs of identifying an infant with hearing loss range from \$5,000 to \$17,750. These costs are deemed reasonable when compared to the cost of identifying infants with other congenital conditions and long-term costs of treatment and education.<sup>16</sup>
- Third-party payers as yet are reluctant to adequately reimburse hospitals and birthing centers for the cost of universal hearing screening and needed follow-up audiologic evaluation for identification. This resistance emanates both from the delayed adoption of universal newborn hearing screening as part of managed care and other health care standard setting as well as from the complex interface needed between health care and educational systems unique to EHDI program

development. Thus, cost savings dollars spill over from health care to education accounting—systems that rarely accommodate related budgets. As health care via school setting delivery trends continue and are reinforced via such initiatives as Healthy People 2010, mechanisms for estimating cost-benefit and cost-effectiveness considerations as well as reimbursement need to be advocated, developed, and effectively managed on federal, state, and local levels.

- IDEA legislation and regulation have “child find” provisions for the 50 state departments of education participating in Part C federal programs for children birth through 36 months; that is, children with disabilities are to identified by school systems as early in life as possible. However, as the hospital birth admission hearing screening is the venue of choice (optimally where parents can be reached

for education on this public health and education issue), health insurance is viewed as the payer for the screening.



- IDEA regulations do specify that children suspected of a disability must be reported to local school agencies in order that family-centered assessment and interventions be expedited. Funding for needed interdisciplinary assessments and technologies continues to be an issue, as states and local education agencies often do not have adequate resources to provide the types of interventions (e.g., American Sign Language, cued speech, auditory-verbal) preferred by families.

## ***What factors should be considered in implementing appropriate EHDI programs for children with hearing loss?***

Early identification, assessment, and intervention should (a) be conducted by professionals with qualifications to meet the needs of children who are deaf or hard of hearing particularly infants, toddlers, and their families; (b) be designed to meet the unique needs of the child and family; and (c) include families in an active, collaborative role with professionals in planning and provision of early intervention services.<sup>17</sup> The JCIH 2000 position statement, principles, and guidelines urge incorporating program benchmarks as well as



quality indicators that are essential to the establishment of quality EHDI programs.<sup>18</sup> In general, intervention programs for babies with hearing loss should have goal components that address acquisition of a functional communication system (spoken, signed, cued, or a combination), linguistic competence, social skills, emotional well-being, and positive self-esteem.<sup>19</sup>

## ***How can I find an audiologist to evaluate my child's hearing or a speech-language pathologist for evaluation of my child's communication development?***

## **Where to Get Help and Advice**

### **Audiologists**

Audiologists are professionals who administer and conduct hearing screening programs; evaluate and treat hearing loss, balance, and related disorders; recommend and provide appropriate technology, including hearing aids and hearing assistive devices and systems; and provide audiologic rehabilitation.

## Speech-Language Pathologists

Speech-language pathologists are professionals who evaluate and treat disorders of speech, language, voice, and swallowing. Based on evaluation results, the speech-language pathologist designs and implements specific intervention programs to meet the communication needs of the child. Parent education and counseling is an important part of these programs.

### Qualified audiologists and speech-language pathologists have:

- ✓ a master's or doctoral degree
- ✓ the Certificate of Clinical Competence (CCC-A or CCC-SLP) from the American Speech-Language-Hearing Association (ASHA)
- ✓ a state license, where required

### To find an ASHA-certified audiologist near you, and for more information:

American Speech-Language-Hearing Association (ASHA)  
10801 Rockville Pike  
Rockville, MD 20852

1-800-638-8255

Email: [actioncenter@asha.org](mailto:actioncenter@asha.org)

Web site: [www.asha.org](http://www.asha.org)

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1 Moeller, M.P. (2000). Early intervention and language development in children who are deaf and hard of hearing. *Pediatrics* (online).

2 Yoshinaga-Itano, C., Sedey, A., Coulter, D.K., & Mehl, A.L. (1998). Language of early and later identified children with hearing loss. *Pediatrics*, 102, 1161-1171.

3 Karchmer, M., & Allen, T. (1999). The functional assessment of deaf and hard of hearing students. *American Annals of the Deaf*, 144, 68-77.

4 Joint Committee on Infant Hearing position statements (1969, 1972, 1982, 1990, 1994, 2000).

5 Harrison, M., & Roush, J. (1996). Age of suspicion, identification and intervention for infants and young children with hearing loss: A national study. *Ear and Hearing*, 17, 55-62.

6 Dalzell, L. et al. (2000). The New York State universal newborn hearing screening demonstration project: Ages of hearing loss identification, hearing aid fitting, and enrollment in early intervention. *Ear and Hearing*, 21, 118-130.

7 Finitzo, T., Albright, K., & O'Neal, J. (1998) The newborn with hearing loss: Detection in the nursery. *Pediatrics*, 102, 1452-1460.

8 Bess, F.H., Dodd-Murphy, J., & Parker, R.A. (1998). Children with minimal sensorineural hearing loss: Prevalence, educational performance, and functional status. *Ear and Hearing*, 7(1), 3-13.

9 National Institute on Deafness and Other Communication Disorders. (1993, March 1-3). National Institutes of Health Consensus Statement: Early identification of hearing impairment in infants and young children. Bethesda, MD: Author.

10 Joint Committee on Infant Hearing. (1994). Position statement. *Asha*, 36, 38-41.

11 American Speech-Language-Hearing Association. (1997). *Guidelines for audiologic screening*. Rockville, MD: Author.

12 U.S. Department of Health and Human Services. (2000). *Healthy People 2010*. (Conference Edition in two volumes). Washington, DC: Public Health Service.

13 American Speech-Language-Hearing Association (ASHA) web site ([www.asha.org](http://www.asha.org)).

14 Joint Committee on Infant Hearing. (2000). Year 2000 position statement: Principles and guidelines for early hearing detection and intervention programs. *American Journal of Audiology*, 9, 9-29.

15 Mehl, A., & Thomson, V. (1998). Newborn hearing screening: The great omission. *Pediatrics*, 101, e4.

16 Hayes, D. (1999). State programs for universal newborn hearing screening. In N. Roizen, & A.O. Diefendorf, (Eds.) *Hearing loss in children. Pediatric Clinics of North America*, 46(1), 89-94.

17 Joint Committee of ASHA and the Council on Education of the Deaf. (1994, August). Service provision under the Individuals with Disabilities Education Act-Part H, as amended, to children who are deaf and hard of hearing ages birth to 36 months. *Asha*, 36, 117-121.

18 See footnote 14.

19 Cherow, E., Dickman, D.M., & Epstein, S. (1999). Organization resources for families of children with deafness or hearing loss. In N.J. Roizen & A.O. Diefendorf (Eds.), *Pediatric Clinics of North America*, 46, 153-162.