Joint Committee on Infant Hearing 1990 Position Statement

The following expanded position statement was developed by the Joint Committee on Infant Hearing. Representatives of the member organizations who prepared this statement include the following: American Speech-Language-Hearing Association — Fred H. Bess, chair, Noel D. Matkin and Evelyn Cherow, ex officio; American Academy of Otolaryngology-Head and Neck Surgery—Kenneth M. Grundfast, co-chair; American Academy of Pediatrics—Allen Erenberg and William P. Potsic; Council for Education of the Deaf — Lita Aldridge and Barbara Bodner-Johnson; Directors of Speech and Hearing Programs in State Health and Welfare Agencies — Thomas Mahoney. Consultants: Alan Salamy and Gregory J. Matz. ASHA monitoring vice president: Ann L. Carey.

I. Background

The early detection of hearing impairment in children is essential in order to initiate the medical and educational intervention critical for developing optimal communication and social skills. In 1982, the Joint Committee on Infant Hearing recommended identifying infants at risk for hearing impairment by means of seven criteria and suggested follow-up audiological evaluation of these infants until accurate assessments of hearing could be made (ASHA, 1982). In recent years, advances in science and technology have increased the chances for survival of markedly premature and low birth weight neonates and other severely compromised newborns. Because moderate to severe sensorineural hearing loss can be confirmed in 2.5% to 5.0% of neonates manifesting any of the previously published risk criteria, auditory screening of at-risk newborns is warranted (Hosford-Dunn, Johnson, Simmons, Malachowski, & Low, 1987; Jacobson & Morehouse, 1984; Mahoney & Eichwald, 1987; Stein, Ozdamar, Kraus, & Paton, 1983). Those infants who have one or more of the risk factors are considered to be at increased risk for sensorineural hearing loss.

Recent research and new legislation (P.L. 99-457) suggest the need for expansion and clarification of the 1982 criteria. This 1991 statement expands the risk criteria and makes recommendations for the identification and management of hearing-impaired neonates and infants. The Joint Committee recognizes that the performance characteristics of these new risk factors are not presently known; further study and critical evaluation of the risk criteria are therefore encouraged. The protocols recommended by the Committee are considered optimal and are based on both clinical experience and current research findings. The Committee recognizes, however, that the recommended protocols may not be appropriate for all institutions and that modifications in screening approaches will be necessary to accommodate the specific needs of a given facility. Such factors as cost and availability of equipment, personnel and follow-up services are important considerations in the development of a screening program (Turner, 1990).

II. Identification

A. Risk Criteria: Neonates (birth - 28 days)

The risk factors that identify those neonates who are at-risk for sensorineural hearing impairment include the following:

1. Family history of congenital or delayed onset childhood sensorineural impairment.
2. Congenital infection known or suspected to be associated with sensorineural hearing impairment such as toxoplasmosis, syphilis, rubella, cytomegalovirus and herpes.
3. Craniofacial anomalies including morphologic abnormalities of the pinna and ear canal, absent philtrum, low hairline, et-cetera.
4. Birth weight less than 1500 grams (-3.3 lbs.).
5. Hyperbilirubinemia at a level exceeding indication for exchange transfusion.
6. Ototoxic medications including but not limited to the aminoglycosides used for more than 5 days (e.g., gentamicin, tobramycin, kanamycin, streptomycin) and loop diuretics used in combination with aminoglycosides.
7. Bacterial meningitis.
8. Severe depression at birth, which may include infants with Apgar scores of 0-3 at 5 minutes or those who fail to initiate spontaneous respiration by 10 minutes or those with hypotonia persisting to 2 hours of age.
9. Prolonged mechanical ventilation for a duration equal to or greater than 10 days (e.g., persistent pulmonary hypertension).
10. Stigmata or other findings associated with a syndrome known to include sensorineural hearing loss (e.g., Waardenburg or Usher's Syndrome).

B. Risk Criteria: Infants (29 days - 2 years)

The factors that identify those infants who are at-risk for sensorineural hearing impairment include the following:

1. Parent/caregiver concern regarding hearing, speech, language and/or developmental delay.
2. Bacterial meningitis.

3. Neonatal risk factors that may be associated with progressive sensorineural hearing loss (e.g., cytomegalovirus, prolonged mechanical ventilation and inherited disorders).
4. Head trauma especially with either longitudinal or transverse fracture of the temporal bone.
5. Stigmata or other findings associated with syndromes known to include sensorineural hearing loss (e.g., Waardenburg or Usher's Syndrome).
6. Ototoxic medications including but not limited to the aminoglycosides used for more than 5 days (e.g., gentamicin, tobramycin, kanamycin, streptomycin) and loop diuretics used in combination with aminoglycosides).
7. Children with neurodegenerative disorders such as neurofibromatosis, myoclonic epilepsy, Werdnig-Hoffman disease, Tay-Sach's disease, infantile Gaucher's disease, Nieman-Pick disease, any metachromatic leukodystrophy, or any infantile demyelinating neuropathy.
8. Childhood infectious diseases known to be associated with sensorineural hearing loss (e.g., mumps, measles).

III. Audiologic Screening Recommendations for Neonates and Infants

A. Neonates

Neonates who manifest one or more items on the risk criteria should be screened, preferably under the supervision of an audiologist. Optimally, screening should be completed prior to discharge from the newborn nursery but no later than 3 months of age. The initial screening should include measurement of the auditory brainstem response (ABR) (ASHA, 1989). Behavioral testing of newborn infants' hearing has high false-positive and false-negative rates and is not universally recommended. Because somefalse-positive results can occur with ABR screening, ongoing assessment and observation of the infant's auditory behavior is recommended during the early stages of intervention. If the infant is discharged prior to screening, or if ABR screening under audiologic supervision is not available, the child ideally should be referred for ABR testing by 3 months of age but never later than 6 months of age.

The acoustic stimulus for ABR screening should contain energy in the frequency region important for speech recognition. Clicks are the most commonly used signal for eliciting the ABR and contain energy in the speech frequency region (ASHA, 1989). Pass criterion for ABR screening is a response from each ear at intensity levels 40 dB nHL or less. Transducers designed to reduce the probability of ear-canal collapse are recommended.

If consistent electrophysiological responses are detected at appropriate sound levels, then the screening process will be considered complete except in those cases where there is a probability of progressive hearing loss (e.g., family history of delayed onset, degenerative disease, meningitis, intrauterine infections or infants who had chronic lung disease, pulmonary hypertension or who received medications in doses likely to be ototoxic). If the results of an initial screening of an infant manifesting any risk criteria are equivocal, then the infant should be referred for general medical, otological, and audiological follow-up.

B. Infants

Infants who exhibit one or more items on the risk criteria should be screened as soon as possible but no later than 3 months after the child has been identified as at-risk. For infants less than 6 months of age, ABR screening (see II A.) is recommended. For infants older than 6 months, behavioral testing using a conditioned response or ABR testing are appropriate approaches. Infants who fail the screen should be referred for a comprehensive audiologic evaluation. This evaluation may include ABR, behavioral testing (6 months) and acoustic immittance measures (see ASHA, *1989 Guidelines*, for recommended protocols by developmental age).

IV. Early Intervention for Hearing-Impaired Infants and their Families

When hearing loss is identified, early intervention services should be provided, in accordance with Public Law 99-457. Early intervention services under P.L. 99-457 may commence before the completion of the evaluation and assessment if the following conditions are met: (a) parental consent is obtained, (b) an interim individualized family service plan (IFSP) is developed, and (c) the full initial evaluation process is completed within 45 days of referral.

The interim IFSP should include the following:

A. The name of the case manager who will be responsible for both implementation of the interim IFSP and coordination with other agencies and persons;

B. The early intervention services that have been determined to be needed immediately by the child and the child's family.

These immediate early intervention services should include the following:

1. Evaluation by a physician with expertise in the management of early childhood otologic disorders.
2. Evaluation by an audiologist with expertise in the assessment of young children, to determine the type, degree, and configuration of the hearing loss, and to recommend assistive communication devices appropriate to the child's needs (e. g., hearing aids, personal FM systems, vibrotactile aids).
3. Evaluation by a speech-language pathologist, teacher of the hearing-impaired, audiologist, or other professional with expertise in the assessment of communication skills in hearing-impaired children, to develop a program of early intervention consistent with the needs of the child and pre-

ferences of the family. Such intervention would be cognizant of and sensitive to cultural values inherent in familial deafness.

4. Family education, counseling and guidance, including home visits and parent support groups to provide families with information, child management skills and emotional support consistent with the needs of the child and family and their culture.
5. Special instruction that includes:
   a. the design and implementation of learning environments and activities that promote the child's development and communication skills;
   b. curriculum planning that integrates and coordinates multidisciplinary personnel and resources so that intended outcomes of the IFSP are achieved; and,
   c. ongoing monitoring of the child's hearing status and amplification needs and development of auditory skills.

V. Future Considerations for Risk Criteria

Because of the dynamic changes occurring in neonatal-prenatal medicine, the committee recognizes that forthcoming research may result in the need for revision of the 1991 risk register. For example, the committee has concerns about the possible ototoxic effects on the fetus from maternal drug abuse; however, present data are insufficient to determine whether the fetus or neonate are at risk for hearing loss. In addition, yet-to-be-developed medications may have ototoxic effects on neonates and infants. Therefore, the committee advises clinicians to keep apprised of published reports demonstrating correlations between maternal drug abuse and ototoxicity and between future antimicrobial agents and ototoxicity. Clinicians should also take into account the possible interactive effects of multiple medications administered simultaneously. Finally, the committee recommends that the position statement be examined every 3 years for possible revision.

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