

## Ongoing Research Projects With CDC-EHDI Funding

### ***Minimal Hearing Loss in Children: Prevalence, Speech, and Language Development and Effects of Early Intervention – Children’s Hospital of Philadelphia***

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**Background:** There has been a growing concern among professionals over children with permanent bilateral mild hearing loss and unilateral hearing loss of various degrees and configurations. Several developmental domains may be affected by the presence of mild bilateral or unilateral loss, including early communication development, speech perception (particularly in noise), functional auditory abilities, social-emotional development, academic performance, and families’ quality of life. Up to 50% of school-age children with mild bilateral or unilateral loss might be affected if grade retention and the need for resource services are considered to be indicators of the potential negative consequences of these forms of hearing loss.

**Purpose:** The proposed investigation focuses on children with mild bilateral or unilateral hearing loss. The intent is to learn more about current practice patterns of clinical audiology programs across the United States that serve children with mild bilateral and unilateral hearing loss; to test the efficacy of hearing screening in preschool years to detect mild bilateral or unilateral hearing loss, and to learn more about children with unilateral hearing loss.

In this study mild bilateral hearing loss is defined as the mean air conduction (.5 – 4 kHz) of 20-39 dB HL in both ears. A second category of bilateral mild high-frequency hearing loss with the same degree of impairment above 2 kHz at two or more frequencies and normal threshold from .5 0 2 KHz. Unilateral hearing loss is defined as mean air conduction thresholds < 20 dB HL in the “normal” ear and mean air conduction thresholds (.5 – 4 kHz) of ≥20 dB HL in the “impaired” ear with no evidence of middle ear disorder based on tympanometry.

**Methods:** The four objectives of this study are to: (1) collect data using two electronic format surveys to identify current audiologic practice patterns for assessing and managing infants and young children (0-3 years) with unilateral and mild bilateral loss; (2) screen preschool children for hearing loss to determine whether direct hearing screening using objective otoacoustic emissions (OAE) testing is useful in identifying permanent mild hearing loss in an at-risk preschool population, which may have not been detected through mandated newborn hearing screening; (3) study children between 12 and 36 months of age cross-sectionally and longitudinally to assess the usefulness of various audiologic management strategies, including hearing aid fitting for infants and young children who have unilateral hearing loss; and (4) contact families of school-aged children (6-18 years) with unilateral hearing loss to seek permission to participate in a study of academic, communication, and auditory skills, and to examine the objective and subjective uses of amplification. These families were identified through a chart review.

**Current Status:** *Objective 1:* An extended version of the audiology questionnaire has been developed and beta tested. The distribution list for the electronic questionnaires (one for mild bilateral and one for unilateral hearing loss) has been compiled and is ready for distribution to clinics that assess and follow a pediatric population regularly. Following the analysis of the results from these questionnaires, and based on reviewers comments on the original application, a second, shorter questionnaire will be developed. This will be sent to a larger group of audiologists who provide services to children on an infrequent basis. *Objective 2:* OAE screening has begun in the targeted preschool population. Staff have been trained and the practice (hearing screening) is now included as routine part of the developmental assessment. *Objective 3:* Enrollment of young (> 12-months and < 36 months) children with unilateral hearing loss has been initiated. A clinical schedule that evaluates each child every other month for auditory development, hearing loss stability, middle ear status, and language development is in place. *Objective 4:* The researchers have reviewed clinical records accumulated beginning in January 2005 to determine a pool of potential young participants with unilateral hearing loss who use a hearing aid and would be willing to participate in the study of their subjective use/practical experience with, and perceived benefit from, amplification fitted to the ear with hearing loss. (Updated 10/2006)