

THE FEASIBILITY OF OTOACOUSTIC EMISSION SCREENING FOR HEARING LOSS IN PEDIATRIC PRIMARY CARE

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Introduction: Comprehensive pediatric primary care should include hearing, vision, and developmental screening (Green & Haggerty, eds., *Ambulatory Pediatrics III*, 1984; American Academy of Pediatrics). Until recently, there was no effective technology for office-based hearing screening of children under three years of age (U.S. Preventive Services Task Force, 1990). The average age of identification of severe hearing loss is 30 months (Commission on Education of the Deaf, 1988). Recommendations are for identification by 12 months (1988, Surgeon General Koop; 1990, *Healthy People 2000*), and preferably prior to hospital discharge (1993 National Institutes of Health; 1994 American Academy of Pediatrics/Centers for Disease Control and Prevention Joint Commission on Infant Hearing). Newborn screening continues to be inadequately available. Only 12 states test half or more of newborns, and only six - Hawaii, Mississippi, New Mexico, Rhode Island, Utah, and Wyoming - test more than 90% (National Center for Hearing Assessment and Management, 1999). Among hospitals that screen neonates, there is a serious problem of missed follow-up diagnostic audiology appointments (as high as 50% in New York State). Recent research shows that when hearing loss is identified at six months of age or earlier, speech-language development is unaffected (Yoshinaga-Itano, et al., *Pediatrics*, 102[5], 1998, 1161-1171). Conductive hearing loss may be associated with chronic otitis media and otitis media with effusion (American Academy of Pediatrics, 1984). This most common of pediatric diagnoses is especially prevalent among children under the age of three. The symptoms associated with hearing loss secondary to OME include language delay and diminished attention span, which are common reasons for developmental referral of toddlers (Early Intervention Program data, New York City and New York State, 1998).

Method: With private funding from EduCap, Inc., the Children's Health Fund and Montefiore Medical Center have begun pilot testing an innovative use of new hearing test technology, distortion product otoacoustic emissions (DPOAE). The OAE technology has been primarily restricted to newborn screening and is little used in pediatric practice. Our protocol includes multiple stages to allow differentiation between possible sensorineural hearing loss (and referral for diagnostic audiology) and middle ear pathology with associated conductive hearing loss (with further distinction between conditions manageable by the primary pediatrician and those that require ENT and/or audiological referral). Testing was done either by a pediatrician or pediatric nurse practitioner.

Results: Analysis of the first 100 hearing screenings indicates that the protocol works reliably in varied pediatric settings. Differentiation between referral paths is effective. Unnecessary referrals are avoided, and the role of the primary provider in managing the patient's needs is maximized. Patients unable to follow up failed newborn screening were tested. Prevalence of otitis media is >40%, as expected in our high social risk population. There are clear differences in the amount of time needed to obtain accurate screening results based on age of patient and other factors, which will be detailed. An unexpected result was increased compliance with follow-up screening and diagnostic appointments.