

Office-Based Hearing Screening Using Otoacoustic Emission

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Background

The prevalence of otitis media (OM) is highest in children aged 2 to 36 months (Paradise et al., 1997). Young children who live in poverty may also represent a group at particular risk for OM (ibid). Socio-economic status and OM may interact synergistically making these children at high risk for communication delays. Hearing screening for young children is difficult using conventional audiometry, frequently resulting in late identification of hearing loss. Otoacoustic emission screening (OAE) technology has been used almost exclusively with neonates. Limited data show that OAE screening may be effective with older children (Nozza, et al., 1997).

The Ready For School Initiative

The New York Children's Health Project (NYCHP), a program of the Division of Community Pediatrics, Children's Hospital at the Montefiore, Bronx, New York, provides medical services to children and families in homeless shelters throughout New York City. Care is provided on-site at shelters and on mobile medical vans.

In collaboration with the Children's Health Fund and a corporate partner (EduCap, Inc.) the NYCHP explored the feasibility of using OAE screening to for early detection of hearing loss in a busy pediatric practice. A comprehensive screening protocol consisting of OAE, tympanometry, and otoscopy was developed and implemented.

Screening results (N=337) suggest the following:

- OAE screening appears to be effective for use with infants and young children;
- Busy primary care providers can incorporate OAE screening in routine pediatric practice;
- Infants (<13 months) have the highest rate of failed screening, often due to internal noise interfering with the accuracy of screening results;
- Outer ear (cerumen) and middle ear state (effusion associated with OM) also influence screening results;
- Differentiation of hearing loss associated with cochlear dysfunction from conductive loss associated with cerumenous plug or middle ear effusion requires that OAE screening be supplemented with otoscopy and tympanometry. This adds to screening time but prevents unnecessary referrals;
- OAE screening at higher frequencies (4k and 5k Hz) is most accurate in a noisy environment. We recommend deleting the 2k Hz screening tone from the default protocol in using distortion product OAE screening equipment.