

## D. Pediatric Amplification Guidelines

The following should be completed by six three months of age for infants with confirmed hearing loss.

### 1. Qualifications for Pediatric Hearing Aid Services

- a. A Medical Clearance must be obtained from an otologist, a pediatric otolaryngologist, or a general otolaryngologist prior to hearing aid fitting.
- b. An audiologist must complete the diagnostic audiologic assessment recommended in the Audiologic Diagnostic Assessment Guidelines section of this document.
- c. An audiologist is the professional singularly qualified to select and fit all forms of amplification for infants and children, including personal hearing aids, FM systems, cochlear implants and assistive listening devices.
- d. An audiologist must have the appropriate Illinois licensure in Audiology issued by the Department of Professional Regulation or must be appropriately licensed in the state in which audiology is practiced.
- e. It is preferred that an audiologist working with infants and children have experience in the management and fitting of amplification in infants and children with hearing loss. The audiologist must also have the equipment necessary to complete the tests required for hearing aid selection and evaluation procedures.

### 2. Criteria for Determining Candidacy for Amplification

Infants should be fit to the "best estimate" audiogram based on the completion of the physiological assessment techniques outlined in the "Audiologic Diagnostic Assessment Guidelines" section of this document. Final amplification decisions should be based on information obtained from ongoing audiologic re-evaluation, performance of the infant in the home and/or educational environment, existence of other special needs, speech, language and auditory developmental milestones, and the family's preferences.

- 1) Estimates from electrophysiologic correlates of hearing sensitivity (i.e., click or frequency-specific auditory evoked potentials, OAE frequency-specific results), OR WHEN POSSIBLE.
  - 2) Ear specific behavioral thresholds obtained by standard audiometric techniques appropriate to the child's developmental level (i.e., visual reinforcement audiometry, conditional play audiometry, or standard behavioral audiometry).
  - 3) Bilateral mixed hearing loss greater than 30 dB HL. The degree and type of hearing loss should be determined by the factors listed above.
  - 4) Unilateral hearing loss greater than 30 dB. The degree and type of hearing loss should be determined by the factors listed above.
- a. A child is considered a candidate for amplification when a permanent, bilateral hearing loss of > 35 dB HL for behavioral testing or when a hearing loss equals 30 dBnHL for click ABR threshold in the better ear is present. The degree of hearing loss may be determined by either estimates from electrophysiologic correlates of hearing sensitivity (i.e. click or frequency-specific auditory evoked potentials, OAE frequency-specific results). When possible, ear specific behavioral testing should also be considered.

### 3. Pre-selection: Physical Characteristics of Amplification

**Note: With bilateral hearing loss, all amplification ordinarily should be binaural unless contraindicated.**

#### a. Amplification options:

- 1) Behind-the-ear (BTE) aids are appropriate for most infants and children. In-the-ear (ITE) hearing aids are not recommended for use with infants and young children due to the growth of the outer ear and problems with increased feedback and safety issues.
- 2) A bone conduction hearing aid may be appropriate if the hearing loss is conductive and BTE hearing aids cannot be worn due to medical or physical contraindications.
- 3) Body aids should only be used when BTE hearing aids cannot be fit due to medical or physical contraindications.
- 4) A cochlear implant may be appropriate if the child has a bilateral profound/severe sensorineural hearing loss, has used appropriate binaural hearing aids, has been enrolled in an appropriate early intervention program, and exhibits minimal benefit from the hearing aids. An FM system coupled to the infant's personal hearing aids should always be considered. Hearing aids with digital processing, dual microphones, multiple channels and directional microphones should be considered for their flexibility, improved signal-to-noise ratio, and other specific features.
- 5) An FM system coupled to the infant's personal hearing aids should be considered when the child becomes mobile and needs to listen to a caretaker/teacher at a greater distance.
- 6) Hearing aids with digital processing, including an FM system and dual microphones, should be considered for their flexibility and their noise reduction algorithms.
- 7) Hearing aids with multiple channels should be considered when the audiometric configuration require the shaping of gain or output in specific frequency regions.
- 8) Directional microphones should be considered only for older children with mild to severe hearing losses to improve signal-to-noise ratio when FM technology, the system of choice to improve signal-to-noise ration, is not being used.

#### b. Amplification requirements for FM system and assistive device compatibility:

- 1) Direct audio-input capabilities (DAI).
- 2) A telecoil (determine the minimum standard of amplification required for sensitivity re: some telecoils are ineffective).
- 3) A microphone-telecoil switching option (M - T switch)

#### c. Amplification safety feature requirements

- 1) Tamper resistant battery doors
- 2) Volume control covers

#### d. All amplification fittings should be biaural in children, unless contraindicated.

#### e. Ear mold requirements

- 1) Should be a soft material

- 2) Should be replaced whenever feedback occurs at recommended settings or when retention becomes a problem.
  - 3) May use with "Ototease" to help reduce feedback.
- f. Retention devices can be used to aid in full-time use.
- 1) "Huggies"
  - 2) "Crittter" clips, with appropriate safety warnings for strangulation possibility
  - 3) Two sided tapes
- g. It is recommended that families should be provided with maintenance kit that includes:
- 1) Dry aid kit
  - 2) Battery tester
  - 3) Listening tube/stethoscope
  - 4) Extra batteries

#### 4. Hearing Aid Selection and Verification

- a. The pediatric hearing aid should be selected and fitted according to procedures that are especially designed for pediatrics (e.g., DSL methodology). The preferred verification method is to use probe microphone measurements and the child's ear, ear mold, and amplification system. The procedure should be combined with a prescriptive technique, which estimates target responses appropriate for the characteristics of the amplification system (linear vs. non-linear, analog vs. digital). This should always include direct measurement of the real-ear saturation response (RESR) and target maximum output values.

Ear mold requirements:

- 1) Should be a soft material
- 2) Should be replaced whenever feedback occurs at recommended settings or when retention becomes a problem

Amplification safety requirements:

- 1) Tamper resistant battery doors
- 2) Volume control covers or ability to disable volume control

It is recommended that families purchase a maintenance kit that includes:

- 1) Dry aid kit
- 2) Battery tester
- 3) Listening tube/stethoscope
- 4) Extra batteries

#### 5. Validation of aided auditory function may be on-going and may include:

- a. Probe microphone measurements to assess output of hearing aid at the tympanic membrane (TM).
- b. Audiologic assessment directly measuring the child's performance including aided sound field responses to speech and frequency specific stimuli.
- c. Functional auditory skill assessment obtained by the audiologist and early interventionist.

- d. Speech, communication, and language skill assessment obtained by the early interventionist and a speech language pathologist.
  - e. Parent input as well as input from other professionals involved with the child.
6. Counseling and Follow-Up:
- a. Information about all appropriate amplification options should be given to the parents prior to final purchase of amplification.
  - b. Parents and other family members or individuals that will assist in the insertion of and maintenance of the amplification system should receive orientation and ongoing support.
7. Suggested frequency of audiologic re-evaluation/follow-up:
- a. At least every three (3) months during the first two (2) years of amplification use.
  - b. Every three (3) to six (6) months after the first two (2) years of amplification use.
8. Audiologic re-evaluation and/or follow-up may include:
- a. Behavioral audiometric evaluations including air and bone conduction (obtain separate ear information as soon as possible; at least by nine months developmental age).
  - b. Immittance measurements to evaluate middle ear function;
  - c. Adjustment of the amplification system based on updated audiometric information;
  - d. Electroacoustic evaluations of the hearing aids;
  - e. Listening checks of the hearing aids;
  - f. Evaluation of ear mold fit;
  - g. Probe microphone measurements, which are very important as changes in the child's outer ear occur as growth takes place;
  - h. Functional gain measurements to document the development of auditory skills.
9. The infant/young child should be enrolled in an Early Intervention Program which includes:
- a. Home visits
  - b. A professional with extensive and in-depth knowledge of, and experience with, children with varying degrees of hearing loss, their families and all the attendant issues

**DISCLAIMER: Early Intervention Services, Medicaid or DSCC may not pay for all services or amplification options.**