Introduction

The diagnosis and early management of hearing loss in infancy requires a team approach that involves the audiologist, otolaryngologist, habilitation specialists, the pediatrician or family physician, and the active participation of parents and other family members. The program described in this chapter is based in an academic medical center where a team of pediatric audiologists, otolaryngologists, and habilitation specialists is currently following approximately 1000 young children with hearing aids and cochlear implants, including over 100 infants fitted with amplification under the age of six months. This chapter will focus primarily on the initial fitting of hearing aids in young infants identified through newborn hearing screening. Practical issues will be examined along with the many challenges that arise in serving this population.

Amplification for Infants: What is needed?

Essential components of an infant hearing care program include timely referral from the newborn hearing screening program; comprehensive audiological and otologic assessments; referral for early habilitative services; appropriate selection of amplification; hearing instrument fitting and verification; hearing aid orientation; behavioral audiometry and readjustment of hearing instruments; parent counseling and education; and ongoing audiological, otologic and habilitative services. Evidence based clinical procedures should be used during each stage of the assessment and intervention process. Weakness in any component can result in a compounding of problems at subsequent stages. While the program described here provides both diagnostic evaluation and hearing instrument fitting in one facility, collaborative efforts among multiple programs are often needed to ensure optimal management.

Timely Referral and Comprehensive Audioligic Assessment

An essential goal of the comprehensive audiological assessment is to obtain frequency-specific estimates of hearing thresholds for use as a starting point in hearing instrument fitting. Auditory brainstem response (ABR) evaluation using frequency-specific test stimuli (e.g. tone bursts) is used to obtain estimates of low, mid, and high frequency hearing sensitivity. When hearing loss is evident, based on air conducted test results ABR assessment is also completed using bone-conducted stimuli.

Auditory Steady State Response (ASSR) measures are being used in some clinics in addition to ABR during the comprehensive assessment. While additional research on ASSR testing in infants with hearing loss is needed (see Chapter 3 by Stapells et al.), ASSR may provide useful information to help distinguish between infants with severe and profound hearing loss. In addition, acoustic immittance measures and otoacoustic emissions are essential components of the comprehensive audiological test battery.

Many of the infants we see have already had one or more diagnostic ABRs before referral to our center. While some of these infants have received a comprehensive ABR evaluation that includes frequency-specific threshold estimation using air and bone

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conduction, otoacoustic emissions, and acoustic immittance measures, many will have had only an air conducted ABR using click stimuli. Consequently, all infants seen in our program have a comprehensive evaluation completed in our facility prior to hearing instrument selection. Repeating the comprehensive assessment is necessary to ensure that threshold estimates are available for low, mid, and high frequencies and that the threshold estimates accurately reflect the infant’s auditory status.

Infants less than three months of age are evaluated in natural sleep. Before arriving at the clinic, parents are informed of the need to time the baby’s feeding prior to the appointment to increase the likelihood the infant will sleep quietly during the diagnostic assessment. For infants older than three months of age, use of sedation according to established guidelines is necessary to obtain a complete study. Sometimes it is possible to complete the diagnostic evaluation in the operating room at the same time other procedures such as placement of ventilation tubes or cleft palate repair are scheduled.

Challenges to Timely Referral and Comprehensive Evaluation

The Joint Committee on Infant Hearing (JCIH 2000) recommends that all infants who do not pass the newborn hearing screening or subsequent rescreening begin appropriate audiologic and medical evaluations to confirm the presence of hearing loss before three months of age. In some screening models infants who do not pass the initial hospital newborn hearing screen are rescreened within one month of hospital discharge and infants who do not pass the rescreen are referred for comprehensive evaluation. In other models, comprehensive assessment is provided immediately following referral from the hospital newborn hearing screen. In either case it is essential to follow established guidelines regarding referral for comprehensive assessment. It is not uncommon for us to see parents of newly diagnosed infants who report that their baby did not pass the initial hearing screening but was subsequently rescreened multiple times until a pass was eventually obtained, or that they were rescreened multiple times without passing but reassured that it was probably due to “debris in the ear canal or fluid in the middle ear.” When this occurs, significant delays in identification and treatment often result.

Service providers working with young infants who do not pass the hearing screening should be mindful of the need for prompt referral to facilities where comprehensive assessment is available. Referrals made prior to three months of age, when the infant still sleeps several hours each day, will increase the likelihood of the infant sleeping naturally during the audiologic assessment and will often eliminate the need for sedation.

While protocols for obtaining frequency-specific thresholds using ABR evaluation have been available for many years (Gorga, Reiland, Beauchaine and Jesteadt 1988; Stapells, Gravel and Martin 1995; Stapells 2000), it is not unusual to see infants and young children whose hearing aids are electroacoustically inappropriate because thresholds were estimated solely on the basis of ABR using click stimuli. Considering the variability known to occur in audiometric configurations, it is essential that frequency-specific ABR measures be used to estimate thresholds for hearing instrument fitting.

Otologic and Other Medical Examinations

Prior to hearing instrument fitting, the infant should be seen for otologic examination and medical clearance. A comprehensive otologic evaluation by an otolaryngologist familiar with hearing loss in infants will include a complete medical history and ear examination. The otolaryngologist may order radiologic studies including CT or MRI, laboratory studies, and electrocardiogram. Results obtained from radiologic studies in our clinic have resulted in the identification of a variety of problems, including agenesis of the eighth nerve, enlarged vestibular aqueducts, cochlear malformations, and in two recent cases, detection of previously unidentified tumors requiring medical treatment. These are all findings likely to have a significant affect on the treatment plan. For example, a child with enlarged vestibular aqueducts and the possibility of progressive hearing loss may require more frequent follow up visits for re-evaluation. The otolaryngologist may also suggest examination by an ophthalmologist, geneticist, or other specialists. It should be noted that at least one-third of children with hearing loss will have one or more disabilities in addition to hearing loss that require special accommodations (Roush, Holcomb, Roush and Escolar 2004). A comprehensive evaluation by a geneticist
may result in early identification of other medical problems requiring treatment. Some families may also find information provided by the geneticist helpful in understanding the etiology of their child’s hearing loss. During the weeks following initial diagnosis, learning more about the cause of hearing loss is of great interest to most families (Harrison and Roush 2001).

Good communication between the audiologist and otolaryngologist during the first year is essential, not only during the initial assessment process, but also as additional information about the infant’s hearing status is obtained. Changes in the child’s hearing thresholds, presence of otitis media, or severe to profound hearing loss with lack of benefit from amplification are all reasons for a return visit to the otolaryngologist. Otitis media with effusion is highly prevalent in infants between six and eighteen months of age and if untreated will reduce the benefits of amplification. Communication between the audiologist, the otolaryngologist, and the family regarding management of middle ear problems increases the likelihood of optimal amplification. In addition to sharing reports of evaluations with the otolaryngologist, results from evaluations should also be sent to the child’s primary care physician, a key individual who is likely to have an on-going relationship with the child and family. When kept well-informed about the child’s hearing status, the primary care physician can support the family and assist with audiologic recommendations and follow-up.

Challenges to Timely Follow-up

In a survey of parents of children with recently identified hearing loss, Harrison, Roush and Wallace (2003) reported that many families experience delays in fitting of amplification because of difficulties with scheduling appointments and/or the need for multiple appointments before hearing aid fitting is provided. In our center we have found that scheduling the infant to see the otolaryngologist on the same day as the comprehensive audiologic assessment reduces delays often associated with obtaining medical examination. If this is not possible, the audiologist may be able to work with the otolaryngologist to facilitate timely access to medical review and clearance for hearing aid fitting.

Frequent visits are often necessary during the first several months following confirmation of hearing loss as the family returns for genetic evaluation, eye examinations, radiologic studies, or other procedures. With good communication among clinic staff, it is often possible to coordinate these appointments with return visits for ear impressions or earmold fitting. Ideally, services will be provided close to home; however, in rural areas or smaller communities where a full complement of pediatric audiology services is not available, it may be possible to collaborate with local service providers for routine services such as earmolds and repairs.

Communicating with Families and Referral for Intervention Services

Sufficient time is needed on the day of diagnostic audiologic and otologic evaluations for discussing the results with the family and for taking ear impressions if the family is ready to proceed with amplification. As noted earlier, many of the families coming to our center have already had at least one other diagnostic evaluation. It has been our experience that the majority of families choose to proceed with amplification immediately following comprehensive assessment. If this is the case, a return appointment for hearing instrument fitting is scheduled approximately two weeks after the comprehensive evaluation. Not all families respond to the diagnosis of hearing loss in the same way. Some families prefer to wait until the child is older or for confirmation of hearing loss with behavioral audiometry before proceeding with amplification. This is, of course, the family’s choice, and it is important for audiologists and otolaryngologists to respect the family’s wishes with regard to the timeline for habilitation. We have found it helpful to offer parents the option of meeting with another family of an infant with similar degree of hearing loss. Several parents in our program have volunteered to meet with families of newly identified children to offer support or consultation. In addition, parents in our region have organized a group that meets monthly where support is provided and information is shared about strategies and resources they have found useful. Parents who attend these sessions report that this has been very beneficial to them as they learn about hearing loss and as their child adjusts to the use of hearing aids or cochlear implants.

A detailed review of habilitative options is beyond the scope of this chapter; however, it is important to keep in mind that early comprehensive intervention
Services are essential. Families of young infants with hearing loss may still be grieving about their child’s diagnosis while trying to learn how to help their child adjust to hearing aid use. It is usually not possible, within a busy audiology or otolaryngology clinic, to provide all the support families need. In North Carolina, following the confirmation of the hearing loss and with the family’s permission, results of the hearing evaluation are sent to a non-profit organization called Beginnings for Parents of Children who are Deaf or Hard of Hearing (www.beginningssvcs.com). Within a week after the comprehensive hearing evaluation, a member of the Beginnings staff, an early childhood specialist knowledgeable about hearing loss, contacts the family and offers to make a home visit. At the time of the home visit, additional information regarding hearing loss and available community resources is provided. A further goal of the Beginnings program is to provide unbiased information regarding communication options to families of children with newly identified hearing loss. Following the meeting with the specialist from Beginnings, the director of the regional preschool program for children with hearing loss and a regional audiologist meet with the family. Once the family decides on an initial educational approach, they are assigned an early intervention specialist who will make weekly visits to the home to assist the family with learning to help the child adjust to their new hearing instruments and to help the family learn the skills they will need to help their child meet communication goals. Among the advantages of this model is that the early intervention specialist will often contact the pediatric audiology staff when minor hearing aid and earmold problems arise and are often able to assist the family in solving these problems without requiring another return visit to the audiologist. The intervention specialists are usually keen observers who are able to monitor the child’s auditory skills and notify the audiologist if there are concerns regarding the child’s progress with amplification.

Selection of Amplification

Selection of hearing instruments for infants requires consideration of their unique needs. Features that should be included are tamper resistant battery doors, acoustically tuned pediatric ear hooks, volume control covers, and FM compatibility. Although care is taken to adjust the hearing instrument using prescriptive formulae, there are times when a family may return home following a visit to the audiology clinic only to find that their infant is reacting negatively to loud sound. In these cases and in cases where feedback occurs prior to the child’s next earmold fitting, it is useful for parents to have the option of reducing the volume control on a short-term basis until they can return to the audiology clinic.

Electroacoustic flexibility is a key consideration when selecting hearing instruments for infants, since it is often necessary to proceed with limited information regarding the degree and configuration of hearing loss. With the use of programmable and digital hearing aids there are now many hearing instruments that have multiple channels and the flexibility to fit a wide range of hearing loss. Some features available in today’s hearing instruments, such as the ability to switch between omni and directional microphones and availability of multiple programs, may not be needed initially but may be useful as the child gets older. It is important to remember that infants fitted with hearing instruments at a few months of age may use the same instruments for several years. Electroacoustic requirements are likely to change with ear canal growth resulting in the need for higher output capability. It is also important to keep in mind

Challenges to Family-Centered Service Delivery

In order for initial diagnostic evaluations and hearing instrument fittings to occur in ways that are “family-friendly,” it is often necessary to re-think our existing models of clinical practice. Most clinical practices have been designed for adults or older children. The provision of hearing evaluation and hearing instrument fitting for infants will likely require modifications to clinic operations to ensure that quality infant care is provided in a way that is supportive and accommodating for families. It is possible to do this even within a busy medical center, but it requires the support of the administrative and medical staff. It is not feasible to provide quality infant hearing care services in the usual brief time slots typically allotted for evaluation of the adult patient. Administrators must be informed that specialized instrumentation and procedures are required when providing hearing care services for infants and that clinic visits will be more time consuming.
that some features that may be appropriate for use with adults, such as adaptive microphone technology, certain noise reduction algorithms and some feedback management systems, may not be appropriate for use with young children. While adults are able to judge when a feature is detrimental in a given listening situation, a young child is unable to control the selective use of these features. The physical size and style of the instrument are also factors that must be considered when selecting hearing instruments for infants. Assuming the electroacoustic characteristics are appropriate, small, behind-the-ear instruments are best when selecting hearing instruments for infants. Additional considerations in the selection and fitting of hearing aids for infants and children can be found in the American Academy of Audiology Pediatric Amplification Protocol (AAA 2003).

**Challenges Related to Initial Hearing Aid Selection**

Families and audiologists often report delays in hearing aid fitting due to the time required to obtain authorization from third-party funding agencies. With advocacy by audiologists, families, and others, it is possible to make changes in existing policies to allow for the special needs of infant hearing aid fitting. Our audiologists have been successful working with state agencies that fund hearing instruments for children to reduce the time needed between authorization request and approval, so that delays in hearing instrument fitting are minimized.

Parents, audiologists, and policymakers are encouraged to advocate for adequate funding so that every child will be eligible to receive high quality hearing instruments. In some areas, funding for hearing instruments is covered by health insurance plans; however, there continues to be significant variability in funding for children’s hearing instruments. In North Carolina, all children under three years of age are eligible to receive binaural digital hearing aids and a personal FM system regardless of family income; however, funding for the purchase of hearing instruments for children over the age of three is more difficult to obtain, and many families struggle to find ways to purchase hearing instruments in later years.

Another concern is that even when adequate funding is available for digital and programmable hearing aids, we continue to see some children fitted with conventional hearing instruments that have limited flexibility or are not compatible with FM systems.

While not a frequent occurrence, we also see some toddlers and young children fitted with in-the-ear style (ITE) hearing instruments. There are many reasons why ITE hearing instruments are not appropriate for infants and young children including the need to recase hearing aids as the child grows rather than simply remaking earmolds, lack of FM compatibility, safety issues related to the hard acrylic casing in the ear canal, and inability to use a loaner instrument when the child’s hearing aid is in need of repair.

**Hearing Instrument Fitting and Verification**

To ensure that speech is both audible and comfortable for the infant or child, it is essential that hearing instrument performance be verified and compared to a specific prescriptive fitting formula (e.g. DSL [i/o], Cornelisse, Seewald and Jamieson 1995). While use of the manufacturer’s fitting software provides a good starting point to “pre-fit” hearing aids based on a selected prescriptive fitting formula, it is not unusual to find that the actual performance of the hearing instrument does not match prescriptive targets for gain and output when verification measures are made. Although the manufacturer’s fitting software may allow the audiologist to select a prescriptive fitting formula, at the present time there is variability in the implementation among different manufacturers. If the audiologist does not verify the performance of the hearing instrument with a real ear measurement system, it cannot be assumed that speech will be audible or that loud sounds will not exceed the child’s comfort levels.

Since it is not feasible to expect infants and young children to sit in front of a loudspeaker for the length of time required for conventional probe microphone measures, a substitute measurement called the Real Ear to Coupler Difference (RECD) measurement (Moodie, Seewald and Sinclair 1994) is used (see Chapter 5 by Munro). The RECD measurement is relatively easy to perform in young infants and takes less than a minute for each ear. If the infant is too active or noisy to complete the RECD measurement, it is possible to use predicted values for each frequency using normative data stored in the real ear measurement system (Seewald and Scollie 1999;
Bagatto, Scollie, Moodie and Hoover 2002). If the small size of the infant’s ear canal is not accounted for by the RECD measurement during infant hearing instrument fitting, the resulting SPL at the eardrum can be as much as 20dB greater than expected (Scollie, Seewald, Cornelisse and Jenstad 1998; Seewald and Scollie 1999).

Regardless of the setting where hearing aid dispensing is provided, it is essential that audiologists have the necessary equipment and expertise not only to program the instruments, but also to verify that the settings are providing audibility and appropriate output levels. It is also important to allow sufficient time for completion of these measures. We schedule two hours for a new hearing instrument fitting with infants. This allows the pediatric audiologist to enter estimated thresholds from frequency-specific ABR into the real ear measurement system and manufacturer’s fitting software, measure the RECD, program the hearing instrument using the manufacturer’s software, verify that the hearing instrument matches prescriptive targets for gain and output, and conduct the hearing aid orientation.

Other Challenges Related to Hearing Aid Management

The volume of infants seen in our clinic has increased each year since the implementation of universal newborn hearing screening. This has resulted not only in additional appointments for diagnostic evaluations, but appointments needed for ear impressions and earmold fitting as well as time needed for troubleshooting equipment problems that inevitably arise. In a busy practice, it may be necessary to hire an assistant to help with minor equipment repairs, shipping, and the logistics of maintaining a supply of loaner hearing aids.

Keeping hearing instruments in good working condition is always a challenge. This is especially true with infants and toddlers who inevitably will have sticky fingers, play in the sand, etc. It is essential that clinics maintain a supply of loaner hearing instruments so that children have consistent use of binaural amplification when one instrument is in need of repair. If institutional funding is not available for this purpose, it is often possible to find service organizations that are willing to provide funding for loaner instruments.

Hearing Instrument Orientation

Once RECDs have been measured and the hearing instrument performance has been verified, the audiologist provides the family with an orientation to the use of the hearing instrument. Family members are given an opportunity to practice inserting and removing the hearing aid and are given instruction regarding care of the instrument and troubleshooting techniques. They are provided with a listening stethoscope, battery tester, air blower, dehumidifier and retention strap.

The family should be advised of the need for frequent earmold remakes during the first year. It is not unusual for an infant fitted with hearing aids at two months of age to require six to eight sets of earmolds in the first year. The need for return visits to obtain a frequency specific audiogram with behavioral audiometry using visual reinforcement audiometry (VRA) beginning at six to seven months of age is also discussed.

Time spent educating the family regarding hearing aid retention issues, troubleshooting and repair, and follow-up schedule will not only help the family get off to the right start but will reduce the number of phone calls the audiologist receives during the first few weeks following hearing instrument fitting.

A return appointment is scheduled three to four weeks following the initial hearing instrument fitting. During that visit the audiologist answers questions, checks on the progress of early intervention services, and discusses any changes in the baby’s auditory behavior with the family. Due to the rapid growth of the ear canal in the first few months of life, it may also be necessary to take ear impressions again during this visit.

Issues to Discuss with Families at Hearing Instrument Orientation

Families should be advised that it is not uncommon for infants to learn to remove the hearing aid, and of the ease with which infants are able to get the hearing aids into their mouths. While this is usually not a problem at two to three months of age, many families report they have problems with the baby removing the hearing aids beginning at about four or five months of age. Options for retaining the hearing instruments include retention straps, “Huggie Aids” and double-side tape. If these options are not success-
ful, another option our families have found helpful on a short-term basis is the use of a lightweight cap that ties beneath the chin. While this is not an ideal solution and may not work due to feedback when the hearing loss is severe, it has been effective in some cases where the parents, despite their best efforts, are unable to keep the hearing aids in place. With this short-term strategy and persistence by the family, most babies will successfully adapt to hearing aid use within a few weeks.

Behavioral Audiometry

Once the infant is sitting up and has reasonable head control, behavioral audiometry using visual reinforcement audiometry (VRA) is attempted. As with other developmental tasks, some babies are able to perform VRA at a younger age than others; however, the majority of babies should be able to successfully perform the VRA procedure by 6–8 months developmental age (Widen 1990; Widen et al. 2000; Gravel and Wallace 2000). For an excellent clinical VRA protocol see Gravel (2000).

We recently reviewed data from the first 70 infants with bilateral sensory hearing loss fitted with hearing aids following referral from newborn hearing screening in our infant hearing program. For these infants, the median age at ABR testing was 2.6 months, the median age at hearing aid fitting was 3.9 months and the median age when a frequency specific audiogram was available for each ear (250–4000 Hz) was 8.5 months. Therefore, frequency specific estimates of hearing thresholds obtained from ABR allowed us to fit the infant with hearing aids more than four months earlier than would have been possible had we waited for thresholds from behavioral testing with visual reinforcement audiometry.

Sufficient time and staff are needed to perform VRA accurately. Although the VRA procedure can be accomplished using the parent as the test assistant, with young infants it is usually more efficient to have an experienced assistant in the sound booth while the baby sits in the parent’s lap. Parental acceptance of the child’s hearing loss is always an important factor to be considered when working with young infants. Prior to universal newborn hearing screening, it was usually the parents who first suspected hearing loss after observing their child’s lack of responsiveness to sound. With many infants now identified at birth, parents are required to accept the diagnosis of hearing impairment with little or no evidence from direct observation. For most infants with severe or profound hearing loss, it is obvious to family members that the infant does not respond well to sound without amplification. For infants with mild or moderate hearing loss who wear hearing aids will tolerate the use of insert earphones attached to the child’s custom earmolds more readily than if the standard foam inserts are used. This allows us to obtain frequency and ear specific audiometric thresholds as soon as possible. For young infants, more than one test session is generally required to obtain a complete audiogram (250–4000 Hz) for each ear.

When updated hearing thresholds are obtained, the hearing instruments are re-adjusted to provide the best match to prescriptive targets for gain and output. It is also important to monitor the baby’s middle ear status using acoustic immittance measures during each follow up visit and schedule a return visit to the pediatrician or otolaryngologist for middle ear management when indicated.

Challenges with Behavioral Audiometry

While the VRA procedure is usually recommended for babies between the developmental ages of approximately six months to 2 ½ years, young children become increasingly more challenging to work with in the second year of life. For this reason, it is a good idea to schedule follow up appointments to attempt behavioral assessment as soon as the baby appears to be developmentally able to do so. Once a complete audiogram has been obtained for each ear, monitoring thresholds for change becomes an easier task.

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full-time amplification, parents sometimes proceed with amplification initially but question the need for hearing aid use as the baby becomes older and responds to speech and environmental sounds without amplification. A comparison of unaided and aided detection thresholds in sound field using warbled pure tones or narrow band noise with the family in the sound booth is a useful way of demonstrating the baby’s improved detection of soft sounds. Another useful strategy is to have one parent sit with the audiologist in the control booth while the other parent is in the room with the infant. Family members are often impressed with the reliability of their infant’s responses during VRA assessment even at a young age. In addition, this provides an opportunity for the audiologist to educate the family about the hearing assessment process.

**FM Systems, Cochlear Implants, and Follow-up Care**

While in past years FM systems were used primarily in educational settings, many families are now choosing to use personal FM systems to improve the signal-to-noise ratio in the home environment and during day-to-day activities such as riding in the car, going to a grocery store or on the playground. A good time to introduce FM systems is often around the first birthday when the child begins to walk and there is increasing distance between the parent and child. It is important that consistent full time use of hearing aids be established prior to the introduction of an FM system. In addition, the appropriate use of FM must be demonstrated to the family.

Frequent return visits to the audiologist and otolaryngologist are needed in the first several months of life to accurately define the type and degree of hearing loss and to complete a full otologic work up. Once the medical assessment is completed, an audiogram has been obtained for each ear, and the infant has successfully adjusted to full-time hearing aid use, the frequency of return visits for follow-up can be decreased to approximately once every three months or as needed for hearing aid repair or earmold remakes.

The management of children with severe and profound hearing loss requires special consideration. It is often incorrectly assumed that lack of response from ABR evaluation means the child has no residual hearing and will not receive benefit from amplification. While lack of response on current electrophysiologic testing (ABR or ASSR) usually indicates at least a severe hearing loss, there may be significant residual hearing particularly in the low and mid frequencies, that will allow the infant to receive benefit from amplification in the early months of life, even if later the child is identified as a candidate for cochlear implantation. Estimates of hearing thresholds based on electrophysiologic measures should be made for purposes of initial hearing instrument fitting, followed by confirmation of thresholds using VRA with insert earphones, as soon as the child is able to perform the task. Families should be informed of the limitations of current electrophysiologic tests and made aware that behavioral audiometry with VRA is necessary to determine the degree and configuration of their child’s residual hearing.

It is especially important that children with severe and profound hearing loss receive careful monitoring during the first several months following hearing instrument fitting to determine if communication goals are being met. If a child has been fitted with appropriate amplification at an early age, is receiving early intervention services and is not making consistent progress in meeting communication goals with amplification during the first few months of life, referral to a cochlear implant team should be offered to the family. It is now common for children with profound hearing loss to receive cochlear implants by one year of age, but good communication between the family, audiologist, early intervention specialists, and otolaryngologist is needed to avoid delays in referral for consideration of cochlear implantation when amplification is not sufficient.

**Summary**

Successful management of hearing loss in infancy requires a team approach that involves the family in collaboration with the audiologist and other service providers. Essential components include prompt and accurate diagnosis followed by intervention based on the family’s preferences. Hearing levels must be carefully predicted using electrophysiologic assessment procedures and initial selection of amplification must be accomplished using an electroacoustic hearing aid selection fitting strategy appropriate for infants. Although accurate diagnosis and initial hearing instrument fitting are vital first steps in the habilitation of the infant with hearing loss, it is important to
remember that a continuum of services is needed during the first year to ensure the best possible developmental outcomes. Follow-up visits will be needed to make new earmolds, to monitor middle ear status, to obtain ear- and frequency-specific thresholds using behavioral audiometry, and to readjust hearing aids to ensure an optimal match to prescriptive targets. In addition to providing technical services, the pediatric audiologist plays a key role in providing emotional support to the family, connecting them with other families of children with hearing loss, and facilitating communication with other professionals.

Acknowledgements

The author is grateful to a team of outstanding colleagues at UNC and to the many parents who have provided helpful feedback on our audiology services.

References


