

Ongoing medical and audiologic monitoring is further recommended for infants with unilateral, mild, or chronic conductive hearing loss. Research has shown that infants with mild or unilateral hearing loss may also have difficulties with speech, language, and communication development, as well as problems with social, emotional, and educational development. Research has also shown that infants with unilateral hearing loss are at risk for progressive and/or bilateral hearing loss. Infants with frequent episodes of otitis media with effusion also require close medical and audiologic monitoring to address possible fluctuating conductive pathology.

Intervention

A critical component of the UNHSI is intervention. An individual plan for follow-up services for families whose child is diagnosed with hearing loss must be developed by the primary care physician/provider and the parent. There are a number of public and private intervention resources that can assist in this process.

Public Resources

Georgia Department of Human Resources

Children 1st can assist hospitals and primary care physicians in ensuring that children who are referred for follow-up actually receive follow-up screening, diagnostics, and intervention. Children 1st serves as the single system point of entry for all child health programs in the Division of Public Health. Children 1st makes referrals to public health programs and can also help families gain access to other appropriate health and community services. Children ages birth to four years who are identified to be at risk due to medical conditions (such as hearing loss) and/or socio-environmental factors are screened, assessed, and referred to appropriate services. Children 1st can coordinate follow-up services for infants who do not pass the hospital inpatient screening and are referred to a local Children 1st Coordinator. To make a referral, contact your health district Children 1st Coordinator (see Children 1st web pages at <http://health.state.ga.us/programs/childrenfirst> for listing).

Programs in the Office of Children with Special Needs, including **Babies Can't Wait** and **Children's Medical Services**, offer a variety of resources for families of infants and children with hearing loss or deafness. These resources include

hearing aids, other assistive technology devices and services, service coordination, and family support and training. Referrals to public health programs for children with special needs can be made through Children 1st or by calling Parent-to-Parent of Georgia (1-800-229-2038 or 770-451-5484 in metro Atlanta).

Georgia Department of Education

Georgia PINES (Georgia Parent Infant Network for Educational Service) is a free statewide home intervention program available to families of children ages birth to five years who have hearing or vision impairments. Using the SKI-HI model from Utah State University, service delivery is focused on family training, based on both the needs of the family and the child. The training promotes understanding of the child's disability and provides functional strategies to stimulate the child's auditory, speech and language development in the home environment. There are trained SKI-HI parent advisors in each of the 19 health districts. Parent advisors are professionals (audiologists, speech therapists and teachers of the hearing impaired) with additional training in the SKI-HI curriculum. The role of the parent advisor is to understand the child and their family and provide the family with information, training, resources and support. Georgia PINES collaborates with other agencies involved with the family. Georgia PINES also has a loaner equipment bank, which includes hearing aids. The Georgia PINES state office is located at 890 North Indian Creek Drive, Clarkston, Georgia 30021. For more information or to make a referral, call 1-800-522-8652 or 404-298-4882 in metro Atlanta, visit the web page at www.gapines.net, or email sullivanch@apachemail.aasd.k12.ga.us.

Private Resources

There are a variety of private resources available across the state, including audiologists, speech-language pathologists, and programs that specialize in the development of a particular mode of communication.

For more information about hearing impairment-related resources available in a particular community, you may wish to contact the Georgia Council for the Hearing Impaired (1-800-541-0710 [V/TTY] or 404-292-5312 [V/TTY] in metro Atlanta, www.gachi.org) and Parent to Parent of Georgia (1-800-229-2038 or 770-451-5484 in metro Atlanta, www.parenttoparentofga.org). You may also visit the UNHSI web page at <http://health.state.ga.us/programs/unhs/>.

Habilitation of the Hearing Impaired Child

Early identification and early intervention are key to establishing a language base for an infant who has a hearing loss. The earlier the child gets intervention, including amplification, the better chance that child has of developing age-appropriate language skills. The goals of habilitation are: 1) to provide amplification and/or communication skills to facilitate language development and 2) to provide training and education for the parents and the child to facilitate the optimum development of communication.

Amplification Options

Three levels of hearing aid technology are currently available: traditional, programmable, and 100% digital. Fitting a child with hearing aids is a complex process. Programmable and digital hearing aids are more flexible and often have a superior sound quality compared to traditional aids. However, these aids are also more expensive and require more visits with the audiologist for re-programming. Children must be given every opportunity to thrive and these technologies provide every opportunity to do so.

1. Hearing Aids

- a. **Behind-the-ear (BTE).** These hearing aids rest behind the ear and present the amplified signal through a tube that is connected to a custom-fit earmold that fits in the child's ear. Due to children's rapid growth, custom earmolds for infants and toddlers must be refit frequently.

- b. **In-the-ear (ITE).** These hearing aids are custom made to fit in the ear, filling the entire ear bowl (concha). All of the electronics for the hearing aid fit within this custom case. Since the ears of babies and small children grow rapidly, ITE aids are considered an impractical alternative. However, ITE aids may be fit on older children and teenagers, although regular remakes may be required.
- c. **In-the-canal (ITC).** These hearing aids are smaller than the ITE aids and fit mostly in the canal area with some of the device outside the concha. This device is not practical for small children for several reasons, including the same impracticality of ITE aids and the small size that allows them to be easily swallowed.
- d. **Completely in-the-canal (CIC).** These tiny hearing aids are seated fully in the bony portion of the ear canal. These aids are not appropriate for children, but may be used later in life.
- e. **Bone-conduction hearing aids.** A bone vibrator that amplifies like a traditional hearing aid may be fit on a headband to stimulate the cochlea mechanically. This may be an appropriate amplification device for children without external ear components.

2. Cochlear implants (CI)

These devices may be appropriate for children aged 12 months and older who do not receive benefit from hearing aids. The child must be severely or profoundly deaf (some physicians use the criteria of a 70 dB level in the better ear). The CI itself is surgically inserted into the cochlea. The other parts of the device, a microphone and a speech processor, are worn on the body. Recent developments have led to small processors worn over the ear with a microphone in a BTE aid case. The information from the speech processor travels by magnetic induction to the 16-22 electrodes in the cochlea. The CI can transmit time, intensity, and frequency information to any surviving hair cells and auditory nerve fibers.

3. Assistive Listening Devices (ALDs)

Other equipment that may improve a child's ability to detect sounds and hear speech may include:

1. **Alerting Devices.** Alerting devices, also known as signaling devices, warn the hard of hearing person of the presence of important sounds they would not otherwise hear. These devices utilize lights, fans, or vibrotactile signals to alert children with hearing loss to phones, doorbells, smoke detectors, alarm clocks, etc. These devices are imperative for developing independence and for home safety.
2. **Personal Listening Devices.** These devices are designed to increase the volume of the speaker's voice in certain situations: a car, a party, classrooms, meetings and other situations where the hard of hearing child is restricted from sitting a short distance from and directly in front of the speaker. Personal listening systems are useful when there is background noise or a fair distance between the speaker and the listener. These systems are designed to work instead of, or in addition to, hearing aids.
3. **Telephone Amplifiers.** These devices amplify the telephone signal and include portable units that strap to the receiver of the phone, complete with handsets that include volume controls. There are entire telephones that may include volume and tone adjustments.
4. **Television Systems.** Home infra-red systems are designed especially for individuals with significant hearing loss to enable them to hear TV or stereo with enhanced sound. They may be used acoustically or with hearing aid accessories such as neck loops, silhouettes and direct audio input via the audio jack input. They are lightweight, have tone and balance controls, and may be used in compatible public facilities like movie theatres.

Parents and children are partners in communication. Therefore, parents and children must develop a communication system together in order for a language system to develop. Communication occurs in a number of ways, including gestures, facial expressions, and vocalizations. Some children will develop language through sounds and speech; others will develop language through gesture or sign language. Some children will use a combination of sounds, speech, and signs. The family must be presented with all the options in an unbiased manner in order to determine the

most appropriate mode of communication for their family and child. Families should understand that they may change their choice of communication mode and that they are not obligated to maintain one mode forever.

Communication Choices

In order to acquire language, communication interaction is of the utmost importance. A child will learn to enjoy communication success if the family and those around them are committed to two-way communication (i.e., responding to the child and encouraging the child to respond back). Choosing a communication approach takes time, and the decision may not necessarily be deciding on one approach for all time. Other approaches can be learned. Family perceptions and values can change as additional knowledge and insight are acquired. Information on all communication approaches should be explored fully to make informed decisions. Families should be encouraged to be open about all approaches, ask questions, and talk to adults who are deaf and hard of hearing as well as other families with children who use a variety of communication modes.

Factors to consider when considering communication approaches.

- **The communication method should promote meaningful, enjoyable communication among the family members.**
- **The communication approach should enable everyone in the family to communicate with the child.**
- **The communication approach should be in the best interest of the child.** The child should be able to use his or her language to influence people and events in the environment and to express feelings, to ask questions, to obtain information and to participate in the worlds of imagination and abstract thought.
- **Other factors to consider are the degree of hearing loss and other handicaps the child may have.**

The following is a short summary of the primary communication options listed in alphabetical order. Often children use two or more approaches in communicating with family, friends, and others.

American Sign Language (ASL)

ASL is a fully developed real language of deaf people, providing the ability to communicate the same, complete meaning as in spoken language. It is a visual-gestural-spatial language in which the signs, fingerspelling and the movement of the hands, face, and body are all part of the language. ASL is a very comprehensive structurally complex, rule-bound, full means of communication. ASL can perform the same range of functions as a spoken language, through a visual system. It has a different grammatical system from English, so one cannot speak English while signing ASL. Language develops through ASL. For the majority of deaf children with deaf parents, ASL is learned from their parents in the same manner that spoken language is acquired by hearing children.

Auditory-Oral (AO)

This approach promotes communication through spoken language, without the use of sign language. Spoken language development is based on maximizing residual hearing through appropriately fit amplification/hearing aids or a cochlear implant. Listening skills, spoken language and speech production are fostered through concentrated, systematic, language-based interactions throughout the child's day. Children learn to make use of visual cues such as speechreading or looking at the face or body to help with understanding when the auditory signal is unclear. Language is fostered by being with other children who use listening and speaking as much as possible.

Auditory-Verbal (AV)

This parent and child-centered approach focuses on spoken language development through listening for children with all degrees of hearing impairment. Through individualized, one-on-one therapy with an A-V clinician, the family learns how to create an environment in which the child learns how to listen, to process oral language from auditory clues and to speak by utilizing the natural stages of typical child auditory, speech, and language development. Language develops by encouraging the child to become independent with their speaking and communication skills in mainstreamed society.

Bilingual/Bicultural (Bi-Bi)

This approach views deaf children from a cultural/linguistic perspective rather than the traditional pathological perspective. American deaf children are perceived as having two languages (American Sign Language and English) and two or more cultures (Deaf culture, mainstream American culture, and family heritage). A language base in ASL (including fingerspelling) is needed to build and develop competency in English. English in the classroom emphasizes the printed word

(reading, writing, and typing). Spoken English may be supported for students who demonstrate natural tendencies and potential in this area but not at the expense of general language development.

Cued Speech

This approach allows a person who is deaf or hard of hearing to see every spoken syllable that a hearing person hears. It is a simple, sound-based, visual system that can be learned in a minimum of 10 -15 hours. Cued Speech is speechreading supplemented by clear visual cues. It is a communication mode (not a separate language or philosophy) that utilizes, in English, eight handshapes to represent the consonant sounds in spoken language and four positions around the mouth to represent the vowel sounds. The primary and original goal of using Cued Speech is to develop language and literacy.

Simultaneous Communication (Sim-Com)

This approach uses both speech and sign simultaneously. A variety of manually coded English systems (e.g., Signing Exact English, Signed English, Conceptually Accurate Signed English, Pidgin Sign English) might be used to provide visual communication while English is spoken. These sign systems follow English word order and are used to support the acquisition of spoken and written English.

Total Communication (TC)

In Total Communication, a variety of modes are used to communicate depending on the needs of the student. A teacher may use speech, aural aids, speechreading, mime, acting, pictures, fingerspelling, Sim-Com or American Sign Language. Clear communication becomes more important than the communication mode.

Other Resources

The Georgia UNHSI web page provides linkage to resources for professionals and families who are interested in more specific information about the implementation of Universal Newborn Hearing Screening and Intervention, as well as resources to provide information for families of infants and children diagnosed with a hearing loss and the professionals who work with these individuals. This page can be accessed at <http://health.state.ga.us/programs/unhs/resources.shtml>. We hope these resources will answer many of the questions you may have. Please let us know about other beneficial links.

A comprehensive listing of additional resources related to early hearing detection and intervention, including information about newborn hearing screening equipment manufacturers, can be found at <http://infanthearing.org/resources/links.html>.

In addition, the following organizations may be helpful:

Alexander Graham Bell Association for the Deaf and Hard of Hearing

2000 M Street, NW, Suite 210

Washington, D.C. 20036

(202) 337-5220, (202) 337-5221 TTY, (202) 337-8314 FAX

info@agbell.org

www.agbell.org

Georgia Bell - Georgia Chapter of the AG Bell Association

P.O. Box 52293

Atlanta, GA 30355

404-355-6963

roushfamily@aol.com

American Academy of Audiology

8300 Greensboro Drive, Suite 750

McLean, Virginia 22102

(800) 222-2336 V/TTY, (703) 790-8631 FAX

sdavis@audiology.org

www.audiology.org

American Academy of Otolaryngology - Head and Neck Surgery

1 Prince Street

Alexandria, VA 22314-3357

(703) 836-4444, (703) 519-1585 TTY, (703) 683-5100 FAX

entnews@aol.com

www.entnet.org

American Academy of Pediatrics, National Headquarters

141 Northwest Point Boulevard

Elk Grove Village, IL 60007-1098

(847) 434-4000, (847) 434-8000 FAX

kidsdocs@aap.org

<http://www.aap.org/policy/infanthear.html>

American Academy of Pediatrics, Georgia Chapter

1330 West Peachtree Street, N.W.
Atlanta, Georgia 30309-2904
(404) 876-7535, (404) 249-9503 FAX
www.gaaap.org

American Society for Deaf Children

PO Box 3355
Gettysburg, PA 17325
(800) 942-ASDC V/TTY, (717) 334-7922 V/TTY, (717) 334-8808 FAX
ASDC1@aol.com
www.deafchildren.org

American Speech-Language-Hearing Association

10801 Rockville Pike
Rockville, MD 20852
(800) 638-8255 V/TTY, (301) 897-7355 FAX
actioncenter@asha.org
www.asha.org

Auditory Verbal International, Inc.

2121 Eisenhower Avenue, Suite 402
Alexandria, VA 22314
(703) 739-1049, (703) 739-0874 TTY, (703) 739-0395 FAX
avi@auditory-verbal.org
www.auditory-verbal.org

Cochlear Implant Association, Inc.

5335 Wisconsin Avenue, NW, Suite 440
Washington, DC 20015-2023
(202) 895-2781 V/TTY, (202) 895-2782
pwms.cici@worldnet.att.net
www.cici.org

Early Hearing Detection Intervention Program

Developmental Disabilities Branch

Division of Birth Defects, Child Development, and Disability and Health

National Center for Environmental Health/Centers for Disease Control and Prevention

4770 Buford Highway NE, Mailstop F-15

Atlanta, GA 30341-3724

(770) 488-7400, (770) 488-7361 FAX

ehdi@cdc.gov

www.cdc.gov/nceh/cddh/ehdi.htm

Georgia Council for the Hearing Impaired

4151 Memorial Drive, Suite 103-B

Decatur, GA 30032

800-541-0710 [V/TTY] or 404-292-5312 [V/TTY] in metro Atlanta, (404) 299-3642 FAX

www.gachi.org

Georgia PINES

890 North Indian Creek Drive

Clarkston, Georgia 30021

404-298-4882, 404-298-4884 TDD, 1-800-522-8652, Fax: 404-298-3610

www.gapines.net

sullivan@apachemail.aasd.k12.ga.us

Marion Downs National Center for Infant Hearing

University of Colorado at Boulder

Department of Speech, Language and Hearing Science

Campus Box 409

Boulder, CO 80309-0409

(303) 492-6283

www.colorado.edu/slhs/mdnc/

National Association of the Deaf

814 Thayer Avenue

Silver Spring, MD 20910-4500

(301) 587-1788, (301) 587-1789 TTY, (301) 587-1791 FAX

nadinfo@nad.org

www.nad.org

National Center for Hearing Assessment and Management (NCHAM)

Utah State University
2880 Old Main Hill
Logan, UT 84322
(435) 797-3589
mail@infanthearing.org
www.infanthearing.org

National Cued Speech Association

23970 Hermitage Road
Cleveland, OH 44122-4008
(800) 459-3529 V/TTY
cuedspdisc@aol.com
www.cuedspeech.org

National Institute on Deafness and Other Communication Disorders

31 Center Drive, MSC 2320
Bethesda, MD USA 20892-2320
(800) 241-1044 V, (800) 241-1055 TTY, (301) 907-8830 FAX
nidcdinfo@nidcd.nih.gov
www.nidcd.nih.gov

OPTION Schools (private oral programs)

(877) 672-5332, (877) 672-5889 TTY
www.oraldeafed.org

**To add resources or to update the above listings,
contact the state UNHSI Coordinator at 404-657-4143,**