

methodologies to be implemented for screening the hearing of newborn infants; guidelines for reporting; and processes to ensure that identified children receive referral for appropriate intervention services.

The Division of Public Health is providing regional training and technical assistance to hospital and health department staff, physicians, audiologists, and others from September 2000 through March 2001.

These recommended guidelines for UNHSI have been developed by the Division of Public Health with assistance from the State Advisory Committee on Newborn Hearing Screening in order to facilitate community UNHSI implementation. Hospitals are encouraged to work with their physicians and District Health Director, as well as other community partners, including pediatricians, otolaryngologists, and audiologists to develop the infrastructure for a comprehensive UNHSI system. This system should include the following components: universal newborn hearing screening, follow-up screening for babies who don't pass the in-hospital screen, diagnosis of hearing loss, intervention, and data management/surveillance.

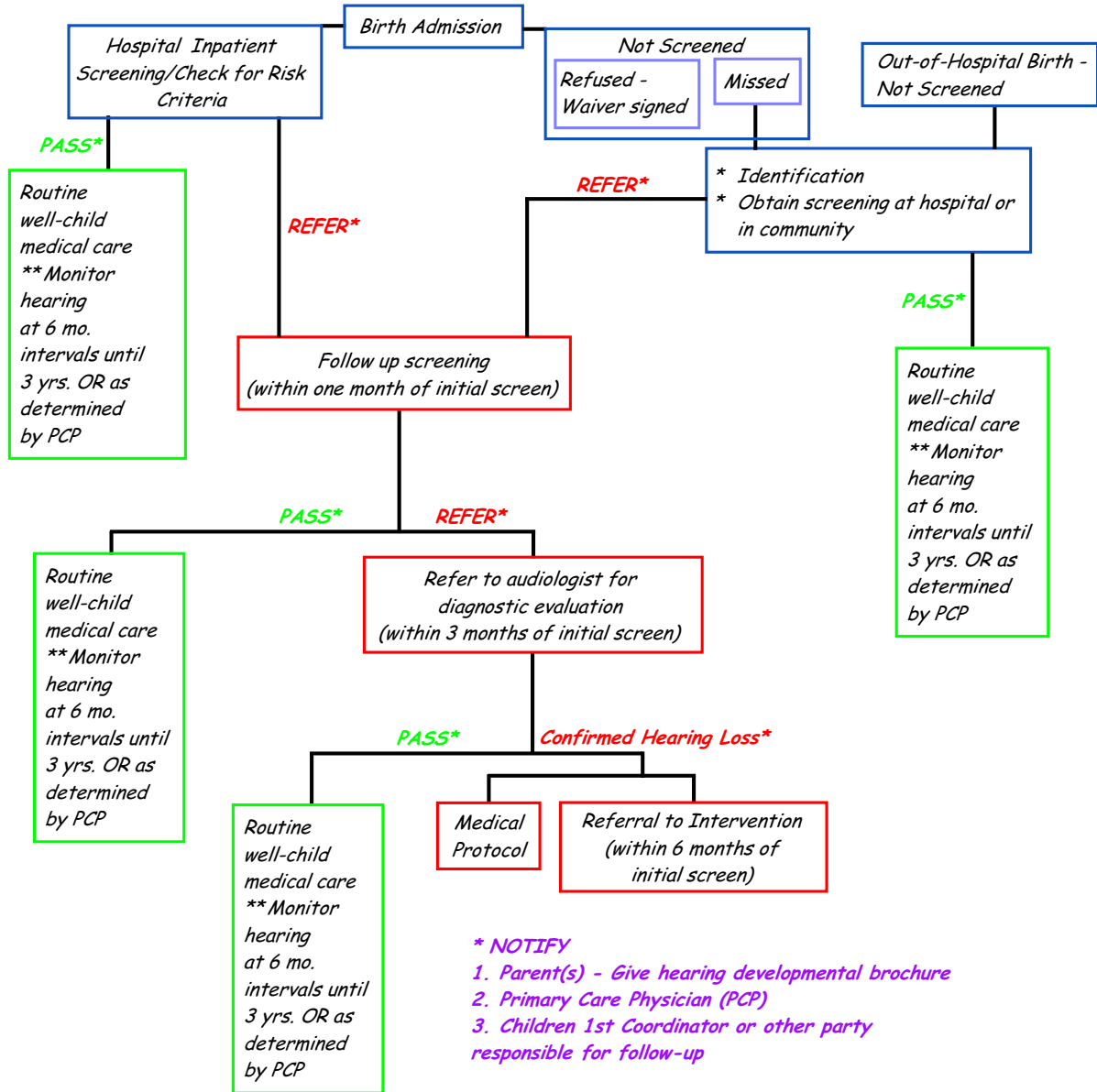
## SCREENING

### *Overview of Georgia UNHSI Program Protocol*

The flowchart on the following page was designed to serve as a guide for implementing a universal newborn hearing screening program. Hospitals are encouraged to work with their public health district, physicians, and other community partners in implementing the system.

The primary care physician and parents should be notified of all screening and test results, including any parents' declination of a procedure or an infant still untested at hospital discharge. Infants who pass the initial screening should receive routine well-child medical care, including screening for delayed-onset hearing loss, if indicated.

## GEORGIA UNIVERSAL NEWBORN HEARING SCREENING & INTERVENTION PROTOCOL



## Hospital Inpatient Screening

The initial hearing screening is to be done in the hospital and may be repeated, as necessary, prior to discharge. If a newborn passes this initial screen, he/she is referred for routine well-child medical care with the recommendation that hearing status be monitored every six months until the child reaches three years of age. If a child does not pass the screening or is not screened, an outpatient appointment for re-screening should be scheduled. If parents refuse to have their baby screened, it is important that they sign a waiver indicating their refusal. It is also important to check for indicators that may put an infant at risk for delayed-onset sensorineural and/or conductive hearing loss (see "Risk Indicators for Hearing Loss", page 30). Hospitals should provide parents of newborns with an educational brochure about the benefits of newborn hearing screening ("Have You Heard?" is available from the Division of Public Health at no cost), as well as a verbal and written report of screening results prior to hospital discharge. In addition, the hospital should notify the primary care physician and the District Children 1<sup>st</sup> Coordinator of screening results for newborns who do not pass the initial screening. Each screening program should ensure prompt follow-up testing for infants who do not pass the in-hospital screening or who aren't screened prior to discharge. Hospitals may wish to set up the appointment for the second (outpatient) screen prior to discharge. Also, communities must develop plans to identify and screen babies who aren't born in hospitals. Data must be maintained and reported quarterly to the Division of Public Health (see "Data Management and Record Keeping", page 22 for more information).

## Follow-up Screening

For infants who don't pass the in-hospital screening, it is recommended that the follow-up screening be done within one month of the initial screening and no later than three months. If the appropriate technology is available (OAE or AABR, see page 13), the hearing screen can be done by the primary care physician, the county public health department, the local hospital, or an audiologist. Primary care physicians should refer any child who does not pass the follow-up hearing screening to a licensed audiologist for audiological diagnostic evaluation and to other health care providers as deemed appropriate (e.g. otolaryngologist, endocrinologist, neurologist).

## Diagnosis

Infants who do not pass the outpatient re-screening need to be scheduled for an audiological diagnostic evaluation. The parents should be provided with information regarding audiological services available in or accessible to their local community (visit UNHSI web page for audiology referral resources). It is recommended that an audiologist perform the diagnostic evaluation within three months of the initial screening and no later than six months of age (See "Audiological Diagnostic Protocol", page 27 for more information). The audiologist should notify (in writing) the parent, primary care physician, and the Children 1<sup>st</sup> Coordinator of the results of the diagnostic audiological evaluation. The audiologist counsels the family, provides them with a family resource guide and schedules the child for subsequent hearing aid evaluation, if that is the family decision.

## Intervention

At this point, the audiologist refers the child for medical clearance to an otolaryngologist. (See "Medical Diagnostic Protocol", page 28 for more information). Otolaryngologists are physicians whose specialty includes the identification, evaluation, and treatment of ear diseases and syndromes related to hearing loss. Families consult an otolaryngologist to determine the etiology of the hearing loss, the presence of related syndromes involving the head and neck structures, and related risk indicators for hearing loss. An otolaryngologist with expertise in childhood hearing loss can determine if medical and/or surgical intervention may be appropriate. When medical and/or surgical intervention is provided, the otolaryngologist is involved in the long-term monitoring and follow-up within the infant's medical home. Subsequently, after receiving medical clearance and completing the hearing aid evaluation, the audiologist sends a report of the recommendations to the referral source, primary care physician, and family. The audiologist also counsels the family regarding communication choices and refers them to appropriate intervention services, such as Babies Can't Wait, Children's Medical Services, Georgia PINES (Parent Infant Network for Educational Services), local speech and hearing centers, auditory-verbal centers and other private/non-profit early intervention resources. Some children may benefit by being referred to a multi-specialty comprehensive diagnostic center or agency, if available. When the child is enrolled in intervention and amplification considerations are met, the District Children 1<sup>st</sup> Coordinator and primary care physician should once again be notified.

## *Build Your Base of Support*

### Physician Support is Essential

It is important to have the support of two different groups of physicians.

First, most hospitals have a pediatric or perinatal committee that provides input concerning policies and procedures involving newborns in the facility. It is essential that these physicians understand and support the newborn hearing screening program and its long-term benefits. Supporting documentation can be found in the following:

- ✓ Federal Legislation-Walsh-Snowe Bill 1999
- ✓ O.C.G.A. 31-1-3.2 whose intent is that by July 1, 2001, newborn hearing screening will be conducted on 95% of all infants born in Georgia hospitals
- ✓ National Institutes of Health Consensus Development Panel
- ✓ The Joint Committee on Infant Hearing
- ✓ The American Academy of Pediatrics
- ✓ The American Academy of Audiology
- ✓ The Commission on Education of the Deaf
- ✓ *Healthy People 2000*

For more information, you may check the UNHSI web page at <http://health.state.ga.us/programs/unhs/>.

Second, physicians in the community who care for babies are equally vital to the success of a newborn hearing screening program. They know the baby and his/her circumstances and are responsible for ensuring consistent and appropriate health care. These physicians are extremely important in encouraging parents to keep follow-up appointments for screening, diagnostic procedures, and intervention, as necessary.

To enlist the support of all physicians, various strategies may be required. However, spending the necessary time in the beginning to ensure physician support is essential to a strong UNHSI program.

## Seek Support From the Nursing Staff

Nurses play a vital role in the care of babies in neonatal units of hospitals. Nurses assess and develop a plan for all patients, including newborns. These plans include assessing whether the appropriate screening is completed prior to hospital discharge. If nurses are convinced of the importance of newborn hearing screening and early identification of hearing loss, they will promote the success of this program. In fact, some of the earliest successful hospital-based newborn hearing screening programs were started and largely operated by nursing staff.

Nurses contribute to the program's success for a number of reasons. Nurses know:

- ✓ When babies are calm
- ✓ When the nursery is the quietest
- ✓ Where there are quiet spare rooms for screening
- ✓ How to coordinate with other hospital services (e.g. PKU, photos, etc.) for availability of the baby for hearing screening
- ✓ How to work with families

## You Need An Audiologist

To start a Universal Newborn Hearing Screening and Intervention program, you need many people involved, especially an audiologist. An audiologist is a person licensed by the state of Georgia to provide audiological services. Some hospitals may currently employ an audiologist, who would be effective in coordinating the UNHSI program. Other hospitals may prefer to consult with a community audiologist to assist in the implementation of UNHSI. Preferably, the audiologist involved in UNHSI should have experience with newborns and children less than one year of age. **Hospitals that do not employ an audiologist will have to develop other methods of involving an audiologist in the UNHSI program.** You may wish to check out the UNHSI web page at <http://health.state.ga.us/programs/unhs/> to get a listing of audiologists who have expressed interest in pediatric audiology.

Other departments or resources, if informed, can be a tremendous help in building a strong UNHSI program. These may include:

- ✓ Prenatal education classes
- ✓ OB/GYN physicians and nurses
- ✓ In-hospital information for staff and patients (e.g., in-house newsletters, patient education channels on the TV, waiting room literature)
- ✓ Follow-up resources, such as audiologists, early intervention programs, speech-language pathologists, school programs
- ✓ Medical community, including pediatricians, family practice physicians, and others
- ✓ Parent advocacy groups



## *Determining the Appropriate Screening Equipment*

In order to implement a UNHSI program, hospitals need equipment and a screening protocol. There are several options, and almost all of the alternatives have been successfully implemented at one hospital or another in Georgia. Hospitals who are just beginning to develop a UNHSI program may want to consult with hospitals that already have an established UNHSI program. For a list of Georgia hospitals that have experience with UNHSI programs, contact the State UNHSI Coordinator at the number listed on the cover.

There are two technologies that can be used for UNHS: Automated Auditory Brainstem Response (AABR) and Automated Otoacoustic Emissions (OAE).

**Auditory Brainstem Response (ABR)** measures the electrical activity of the auditory nerve at the level of the brainstem. A normal ABR measurement implies normal auditory function from the outer ear through the mid-brainstem. Clinical or diagnostic ABR measurement has been in use since 1974. Screening or **Automated Auditory Brainstem Response (AABR)** has been available since 1985.

**Otoacoustic Emissions (OAE)** measure the integrity of the outer hair cells in the cochlea (inner ear). A normal OAE measurement implies normal peripheral auditory function from the outer ear through the middle ear to the outer hair cells of the cochlea. Clinical or diagnostic OAE measurement has been in use since 1988. Screening or **Automated Otoacoustic Emissions (AOAE)** has been available since 1996. There are two types of otoacoustic emissions technologies that can be used: transient evoked and distortion product. Both types are good choices. The differences can be discussed with the medical staff and the audiologist responsible for the screening protocol.

Physicians and audiologists generally administer the clinical or diagnostic versions of each test technology, with required test interpretation. The screening or automated versions of each test technology can be administered by other trained personnel, since the test results are reported automatically as a "pass" or a "refer". Therefore, automated technology is desirable for UNHS programs.

If a newborn passes an automated version of either test technology, it is implied that he/she has normal to near normal hearing sensitivity. However, some mild and unusual configuration hearing losses may be missed. The false negative rate for significant losses (greater than mild in degree) should approach 0% for each technology. The false positive rate for each technology should be 5% or less.

All the technologies have advantages and disadvantages. However, both technologies should be able to accurately screen for cochlear hearing loss. Hospitals should solicit the advice of an audiologist from their community or public health staff to assist in determining the best method for screening. It is clear, however, that the type of equipment selected is not the most important factor in whether the program will be successful. Equipment continues to be modified and improved, and it is almost certain that better, faster, and easier-to-use equipment will become available in the future.

There are several factors that need to be considered prior to choosing a hearing screening technology. Below you will find a list of some of the considerations in deciding what is most appropriate for a facility.

### **1. Preference of the individual hospital**

It is well known that the motivation of the personnel performing universal newborn hearing screenings is one of the most important factors in the success of a program. Allowing a hospital to provide input in the decision-making will help them buy into the program and help them feel that it is their own.

### **2. Age of current equipment**

Some hospitals in Georgia already own equipment, even if it is not being used. It is important to make sure that all equipment is current, in proper working order, and not duplicated needlessly.

### **3. Cost**

Consideration needs to be given to the cost of the equipment, the disposable supplies, and equipment upgrades.

### **4. Storage space**

Although both technologies are portable, some equipment and disposables require more storage space than others (some manufacturers will send disposable supplies "just in time" to reduce the amount of storage required).

### **5. Personnel available for testing**

Hospitals use various personnel for newborn hearing screenings, such as nursing staff, audiologists, technicians, volunteers, etc. Hospitals may use part-time or full-time employees, depending on their needs.

### **6. Location to nearest follow-up site**



Consideration should be given to the distance families of referred children must travel to obtain follow-up services. In rural areas, hospitals may want to consider increasing the number of inpatient or outpatient screenings prior to diagnostic referral to reduce the false positive rate.

#### **7. Technology available at follow-up site**

Hospitals and health districts may elect a particular technology for inpatient screenings, based on the availability of another technology for follow-up screenings. This should be discussed with the physicians and audiologists receiving the follow-up referrals.

#### **8. Number of births**

The number of births per year should also be considered in choosing the number of pieces of equipment needed to provide screenings for all newborns.

#### **9. Length of stay for babies**

If screenings are obtained within 24 hours after birth, the AABR may have a lower false positive rate than the AOAE due to vernix debris in the ear canal. However, after 24 hours of age, the false positive rates between the two technologies should be similar.

#### **10. Documented data and research available**

Some equipment has been on the market and some manufacturers have been in the business for a number of years. There is some research published in peer-reviewed journals related to equipment sensitivity, specificity, and effectiveness. Hospitals and health administrators should consider reviewing this information prior to making a technology decision. Equipment should be FDA approved and able to detect hearing loss greater than 30 dB in the speech frequencies. You may wish to check out the Resources on the UNHSI web page at <http://health.state.ga.us/programs/unhs/> for references.

#### **11. Ability to store, print, and download data**

If computers are being used in a hospital, then the ability of the equipment to store and download information to a database should be considered. If the program is small, a "paper and pencil" method may be adequate.

#### **12. Inability to alter equipment parameters**

In choosing one specific piece of equipment over another, you will want to ensure

that the equipment's parameters cannot be tampered with or modified.

### 13. **Equipment warranty and calibration**

The length of the warranty, the cost of additional warranties versus the cost of repairs, and the cost of annual calibration should be evaluated prior to choosing one technology over another.

### 14. **Vendor Customer Service**

Additional factors for equipment selection consideration should include vendor support provided by audiologist for training, availability of trial units, replacement equipment for failed equipment, prompt delivery of supplies

## *Decide How to Set Up the Program*

Regardless of the technology selected or the protocol used, decisions have to be made about a number of procedural issues that are important for an efficient, cost-effective, successful UNHSI program. The following questions need to be addressed:

### Who's in Charge?

If no one is responsible for a task, it often remains unfinished. Many hospitals in Georgia have demonstrated that newborn hearing screening can easily be incorporated into the routine care of newborns. Just like any other procedure, it takes attention to detail and someone who is ultimately responsible to make sure that every last detail is carried out. The person responsible for day-to-day operations of the program must *communicate well* with nursery staff, *understand the screening procedures*, and most of all, *be committed to the success* of the program. Depending on how the program is organized, most hospitals find this person will require between 2 and 6 hours per week per thousand births annually to coordinate and manage the UNHSI program.

Specific activities that might be included in a job description for the Coordinator of a hospital UNHSI program may include the following:

- ✓ Defines test protocol
- ✓ Coordinates the team of hearing screeners who conduct hearing screenings in all locations in the hospital
- ✓ Ensures appropriate training, supervision, and evaluation of hearing screeners
- ✓ Maintains records of newborn hearing screenings

- ✓ Maintains equipment and supplies
- ✓ Defines follow-up protocol; coordinates follow-up of babies who did not pass or receive a hearing screen during their hospitalization
- ✓ Evaluates refer rate to minimize false positive rate, reduce parental anxiety, and reduce need for diagnostic services
- ✓ Maintains statistical records related to the program and reports such data to the Division of Public Health
- ✓ Maintains a program of quality assurance related to expected outcomes for the program
- ✓ Prepares a budget and maintains financial responsibility for the program
- ✓ Collaborates with referral sources for diagnosis of hearing loss and intervention
- ✓ Maintains quality of care and incorporates relevant findings into clinical practice
- ✓ Provides a program of continuous quality improvement
- ✓ Collaborates with local, state, and national groups to enhance services for children with hearing impairments
- ✓ Acts as a resource for concerned parents, physicians, or public relations personnel

### Who Will Do the Screenings?

Reports from hundreds of operational programs provide clear evidence that newborn hearing screening can be done by a wide variety of people, including audiologists, nurses, technicians, volunteers, and students. In Georgia, the law (Official Code of Georgia, Section 43-44-7) states that "a person not licensed as an audiologist may perform non-diagnostic electro-physiologic screenings of the auditory system, using automated otoacoustic emissions or automated auditory brainstem response technology as part of a planned and organized screening effort for the initial identification of communication disorders in infants under the age of three months, provided that:

1. The person not licensed as an audiologist has completed a procedure-specific training program directed by an audiologist licensed under this chapter;
2. The screening equipment and protocol used are fully automated and the protocol is not accessible for alteration or adjustment by the person not licensed as an audiologist;
3. The results of the screening are determined automatically by the programmed test equipment, without discretionary judgment by the person not licensed as an audiologist, and are only reported as 'pass or fail' or 'pass or refer';

4. An audiologist licensed under this chapter is responsible for the training of the person not licensed as an audiologist, the selection of the screening program protocol, the determination of administration guidelines, the periodic monitoring of the performance of the person not licensed as an audiologist, and the screening program results; and,
5. The participation of the person not licensed as an audiologist in an automated screening program is limited to the recording of patient demographic information, the application of earphones, electrodes, and other necessary devices; the initiation of the test; the recording of the results; and the arrangement of the referral for those who do not pass the screening to an audiologist licensed under this chapter for follow-up evaluation."

Some specific considerations to think about when deciding who will perform the screenings:

- ✓ Can existing staff be asked to incorporate infant hearing screening into their daily activities?
- ✓ Will staff perform infant hearing screening frequently enough to develop adequate skills and reduce the number of false negatives?
- ✓ How many babies will need to be screened each day?
- ✓ What time of day would work best for your facility to perform the testing?
- ✓ Who is available 7 days a week?
- ✓ What groups of people are available for consideration: nurses, volunteers, technicians, medical receptionists, outside contract labor, students?
- ✓ Will these people be part-time or full-time employees?
- ✓ Can the people chosen to do the screenings do other tasks such as data collection, talking to parents about results, interacting with physicians, or supply/equipment management?
- ✓ How will these people relate to the nursery staff?
- ✓ How much orientation will these people require to perform a quality job with low referral rates?
- ✓ Will these people stick with the job? (Constant retraining may be a problem)

## When should hearing screenings be conducted?

The answer to this question is very dependent on the facility. The time of day may vary depending on different locations such as Neonatal Intensive Care Units (NICU) vs. well-baby areas. Some things to think about before making this decision:

- ✓ A quiet environment makes testing much faster and more efficient. **This should be the primary consideration in deciding when to perform screenings.** The area does not have to be silent, but the quieter it is, the easier it is to test.
- ✓ When do physicians make rounds?
- ✓ When and where are circumcisions performed?
- ✓ When are metabolic screens collected?

Some hospitals screen during the night hours, some during the day. There is no wrong time, only the best time for a hospital and staff. Keep in mind that when performing automated OAE screens, false positives may be reduced if screening is done after a baby is 24 hours old.

## Other Considerations

Each facility must decide how to best customize the UNHSI protocol to their community's needs, taking into consideration the following questions:

- ✓ What is the cost to implement and maintain a UNHSI program?
- ✓ How long do babies typically stay in the hospital prior to discharge?
- ✓ Who will be doing the screening, what are his/her skills, can he/she be provided with a detailed and complete orientation?
- ✓ Is space for storage of equipment and supplies available near the screening area?
- ✓ Are community follow-up services available for those babies who don't pass the hospital screen?
- ✓ Will it be difficult to get parents to return for repeat screenings?

The fact that successful programs currently use a variety of protocols suggests that no one protocol is really best for all situations. Regardless of the protocol selected, it is best to have a written document to guide the activities of all people associated with the UNHSI program.

## *How Will You Educate Families?*

Parents are the most important stakeholders in a community's implementation of a successful UNHSI program, since they are the ones who have long-term responsibility for ensuring that the baby receives appropriate care. They are also the ones who have the strongest feelings (but usually limited experience) about what it means to have a child with a hearing loss.

O.C.G.A. 31-1-3.2 requires that parents of Georgia newborns are educated regarding the importance of newborn hearing screening and follow-up care. However, this education is **not** to be considered a substitute or alternative to the newborn hearing screening.

Most successful UNHSI programs use a variety of materials to educate, inform, and follow up with parents. A videotape explaining how the screening is performed is a great tool to use with parents during birthing classes or for those that request more information. Other information for parents and their families include informational pamphlets about the UNHSI program, letters to the parents with the results of the screening, a list of community resources for the baby who does not pass the screen, and appointment cards for either rescreenings or diagnostic evaluations.

"*Have You Heard?*", an informational brochure regarding Georgia's UNHSI initiative, is available at no cost from the Division of Public Health. You may download an individual copy of the brochure from the UNHSI web page at <http://health.state.ga.us/programs/unhs/>. Additionally, you can order the brochures for distribution to families by using the "*Request for Infant and Child Health Form*" (see Appendix 2, page 46).

The most important thing to remember is to communicate accurate information to the parents at a time when they can understand it and when they are likely to benefit from it.

## *Notification of Results and Follow-Up Care*

Once a baby has been screened in a hospital, regardless of the results, or if the parents have declined the screening for their baby, the facility needs to notify both the parents of the baby and the baby's primary care physician/provider in writing of the screening results or the declination.



Prompt follow-up is needed for those babies who don't pass their hearing screening in one or both ears prior to hospital discharge, for babies who do not receive a hearing screening prior to discharge, and for babies at risk for delayed-onset sensorineural and/or conductive hearing loss (*audiologic monitoring every six months until the child's third birthday*). If the facility does not provide follow-up outpatient screenings, the family should be offered assistance in locating a suitable resource for follow-up screening. It is critical that families are made aware of the importance of this follow-up screen. The facility also should refer the baby to their District Children 1<sup>st</sup> Coordinator. You may find a listing of Children 1<sup>st</sup> Coordinators by contacting your local health district (see Appendix 4 for listing of health districts, page 48) or the Children 1<sup>st</sup> web pages at <http://health.state.ga.us/programs/childrenfirst> .

Finding audiologists for follow-up of babies will vary from community to community. Staff may already be aware of local resources. In some cases, a more distant search may be required to find qualified audiologists and ENT support. Facilities are encouraged to talk with pediatricians and health department staff to develop a list of local resources. One thing to keep in mind is how comfortable an audiologist is in testing babies and children. You may wish to check out the UNHSI web page at <http://health.state.ga.us/programs/unhs/> to get a listing of audiologists who have expressed interest in pediatric audiology.

### ***Financial Considerations***

As birthing hospitals begin to develop the UNHSI program, financial concerns may arise. Recent data show total costs of the program to be between \$8 and \$50 per baby. This includes all of the costs associated with personnel, equipment, supplies, and hospital overhead. These estimates are based on cost analyses of actual programs and include all of the costs for activities related to screening babies prior to hospital discharge, outpatient screening, and tracking the babies into the diagnostic assessment.

The National Center for Hearing Assessment and Management (NCHAM) has developed an accounting spreadsheet where you can specify in a few minutes all of the assumptions and cost specifications for your hospital, and the computer will automatically calculate the cost per baby, the annual total cost, and the cost per baby identified. You can also use this spreadsheet to see how the costs are affected if you set your program up in a different way--for example, if you used volunteers instead of paid hospital staff to do the screening, or if you used equipment X instead of equipment Y. You may access this resource on the web at

<http://infanthearing.org/resources/costperbaby.html> .

Currently, some third party payers reimburse for newborn hearing screening. An incentive reimbursement of \$40 per Medicaid baby screened will be paid through the Division of Public Health, if a hospital screens 85% or more of **all** births. Hospitals should contact their district health director (see Appendix 4 for listing, page 48) for more details.

Ongoing expenses required for the program will include, but not be limited to the following:

- ✓ Salary (Coordinator, screeners - depending on program structure)
- ✓ FICA expenses
- ✓ Equipment maintenance and replacement
- ✓ Screening disposables and supplies
- ✓ Printing of parent education materials, letters, and daily work log/sheets
- ✓ Office supplies

Financial donations and community support may be available to provide support for establishing or maintaining a program. Private foundations and service clubs are a possibility but will most likely limit their donations to the costs associated with establishing the program and not ongoing operation. Many hospitals have been successful in getting service clubs and auxiliary organizations such as Quota Club, Lions Club, or Sertoma to provide the money necessary to buy additional newborn hearing screening equipment. Contact your local Chamber of Commerce to get a list of local civic groups that might provide assistance.

### ***Data Management and Record Keeping***

Maintaining records, data, and statistical information about newborn hearing screening testing is absolutely necessary and can be done in a variety of ways. Some hospitals use a manual system while others use commercially available software. The most important thing is developing a system that will work for a particular facility.

The Electronic Birth Certificate (EBC) reporting system, currently being used by Georgia's birthing hospitals, is being updated to accommodate the timely reporting of hospital newborn hearing screening results. The EBC downloads will be important in populating the surveillance database used to follow babies who do not pass the hospital screens and to ensure that these infants receive a diagnostic

audiological evaluation and, if diagnosed with hearing loss, referral to appropriate intervention.

Key components of the data management system should include:

- ✓ Maintaining daily records of individual screens (A sample log is included in Appendix 6, page 50.)
- ✓ Reporting the program aggregate numbers to the Division of Public Health: births, babies screened, babies who passed the screen, and babies who did not pass the screen at the time of hospital discharge. The *"Hospital Report Form for Universal Newborn Hearing Screening"* (See Appendix 5, page 49) was developed to meet the legislative reporting requirements. Additional data elements are included to more accurately assess your hospital's screening rate by including all factors such as deaths, transfers, and refusals.
- ✓ Tracking and following up with babies who did not pass the hearing screen.

Whatever system a facility decides to use for data management, hospitals are required to report data to the Division of Public Health. O.C.G.A. 31-1-3.2 specifically requires that "every licensed or permitted hospital shall report annually to the Department of Human Resources concerning the following:

1. The number of newborn infants born in the hospital;
2. The number of newborn infants screened;
3. The number of newborn infants who passed the screening, if administered; and
4. The number of newborn infants who did not pass the screening, if administered."

### ***Evaluating Your UNHSI Program***

Maintaining a high quality of service requires quality assurance. The intent of the Georgia General Assembly in passing the new law was to promote the screening of 95% of all newborn infants born in hospitals in Georgia for hearing loss prior to hospital discharge.

In addition to screening rate, another important variable to be monitored is the referral rate. An acceptable standard is 4% or less. Some specific strategies to achieve the lowest referral rate are suggested in the next section "Lessons Learned from Existing Programs".

In evaluating your UNHSI program, you may wish to determine the:

- ✓ Percentage of eligible births screened ("eligible births" are defined as the number of live births less the number of newborn deaths, the number of infants transferred to another hospital without hearing screening, and the number of newborns whose parents refused screening)
- ✓ Percentage of eligible births passed at discharge
- ✓ Percentage of eligible births missed (did not receive a hearing screen)
- ✓ Percentage of babies referred for further screening
- ✓ Percentage of babies who are referred from the initial screening, fail the second screening, and eventually receive diagnostic evaluations
- ✓ Number of babies identified with sensorineural hearing losses

You may wish to summarize at least annually the successes of your UNHSI program, the challenges that still need to be addressed, and the strategies for resolving those challenges. It may be helpful to highlight the human side of any success stories.

### ***Lessons Learned from Existing Programs***

Keeping the referral rate as low as possible should be a goal for every UNHSI program. Some strategies to reduce referral rates are applicable regardless of the technology used, and others apply only to specific technologies.

#### **Schedule Screening When Babies Are in the Best Behavioral State**

Even though it is possible to screen babies who are awake and restless, screening is more efficient and results are better if the screening is performed when the baby is quiet, asleep, happy, well-fed, and/or comfortable. Therefore, if possible, the majority of screening activities should be scheduled when babies are most likely to be in this optimal state. When and where the screening is done will depend on other activities, routines, and available space at your hospital.

#### **Perform a Repeat Screening Prior to Discharge for Babies Who Do Not Pass**

Most programs do not consider the initial screening to be complete until the baby leaves the hospital. Typically, the first attempt to screen the baby is made shortly after birth. It seems to work best to not spend too much time with the baby during this initial attempt. If the baby passes, as the majority will do, screening is complete. If the baby does not pass, and it's possible, wait several hours or until the following day and repeat. **Regardless of the equipment or protocol used, these second efforts prior to discharge can substantially reduce the number of babies needing outpatient follow-up screenings or diagnostic procedures.** Instead of spending 30 minutes with a baby during an initial attempt, it is much more efficient to make a quick first attempt, followed by a second or even a third attempt a few hours later or the next day. In other words, repeated short attempts are usually more successful than a single prolonged effort.

### **Minimize Noise and Confusion in the Screening Area**

None of the screening equipment requires extraordinary measures to make the screening area quiet. Newborn hearing screening is routinely being done in neonatal intensive care units and in crowded, relatively noisy, well-baby nurseries. However, all other things being equal, screening will be faster and more effective if noise and confusion are minimized in the screening area. It is preferable to do most UNHS when doctors are not making rounds. Do not screen directly under a ventilator fan or with a baby on a jet ventilator. Also, use an area not adjacent to a bathroom where running water creates unnecessary noise. A newborn hearing screening program can operate in almost any environment, however, sensible and inexpensive modifications can be made to reduce noise, (e.g., carpeting on the floor, curtains on the windows, a portable room divider which provides some sound attenuation, etc.) and increase the efficiency of screening.

### **Use the Best Protocol For Your Situation**

In an effort to keep referral rates as low as possible, some hospitals use both OAE and ABR technology prior to hospital discharge. In situations where it is difficult to get babies back for an outpatient screen, such a protocol can save time, money, and hassle for the program and families. The downside, of course, is the additional cost of using two types of equipment. Some manufacturers offer both OAE and ABR on the same unit for substantially less than what it would cost to purchase both pieces independently.

### **Have Backup Equipment and Supplies Readily Available**

Because some babies are discharged in a relatively short period of time, it is essential to have backup equipment available within 24 hours in the event of a breakdown. Most newborn hearing screening equipment is extremely reliable. However, if the equipment unexpectedly stops operating, and it takes three days to get a replacement, there will probably be 10% or more of the babies born at the hospital that month who won't get screened prior to discharge. Although these babies can come back for outpatient screening, it is extra work for everyone and unlikely to be completely successful. Therefore, make arrangements to obtain replacement or loan equipment within a very short time from the equipment salesperson, a neighboring hospital, university, audiologist, or school district. It is also important to have sufficient supplies or replacements for consumable parts (e.g., probe tips, electrodes, ear couplers).

### **For OAE Procedures, Probe Fit is Critical**

If OAE technology is being used, the single most important factor in reducing refer rates is to make sure that screeners understand how to achieve appropriate probe fit. Although this is relatively easy to learn, it may not be immediately obvious to screeners and usually has to be taught.

### **For ABR Procedures, Screen When Myogenic Activity is Low**

AABR screeners have artifact rejection systems built in so data are not included in the average when myogenic activity is high. Myogenic activity is caused by muscle tension. If babies are tense, wiggly, or restless, myogenic activity will be higher, and it will substantially increase the screening time. It may result in more babies who need to be rescreened because a pass could not be obtained. Thus, it is best to screen when babies are relaxed, happy, well-fed, and, if possible, asleep.

### **You Don't Need Informed Consent**

The Georgia Informed Consent law does not apply to newborn hearing screening. Therefore, written parental consent is not necessary. Every effort should be made to educate parents about newborn hearing screening prior to when it happens (what it is, why it is important, how it is done). This can be done with information in the pre-admission materials, prenatal classes, media materials, or placed in the baby's crib. If, based on this information, parents do not want to have their baby screened; they have the right to refuse. It is a good idea to require that they give you written documentation of that refusal, which is kept on file.

## **IDENTIFICATION**