

KANSAS NEWBORN HEARING SCREENING GUIDELINES



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I. INTRODUCTION

Infant hearing screening has undergone major changes over the past thirty years. Because of advancements in hearing screening technology, universal newborn hearing screening (UNHS), which means screening the hearing of *all* newborns, now has the support of many groups including parents, pediatricians, family practice physicians, otolaryngologists, neonatologists, audiologists, nurses, persons who are deaf/hard of hearing, and specialists in early intervention for children with hearing loss such as speech-language pathologists and teachers of the deaf/hard of hearing.

Thirty years ago, audiologists identified hearing loss in infants and toddlers by careful observation of their behavioral responses to sound. This method was neither scientific nor reliable in identifying mild to moderate degrees of hearing loss. Even with normal hearing, infants and toddlers have variable responses to sound.

Later, auditory brainstem response (ABR) became the preferred method to assess the auditory system. Although reliable, it required considerable time and expertise, limiting its use to only those infants who were considered at high risk for hearing loss. More recently it became possible to test for ear “echoes” (called otoacoustic emissions, or OAE). Currently, ABR and OAE testing have been automated with computer technology and can be used in combination or alone to screen hearing.

Newborn hearing screening makes a difference for all children and their families, and information about hearing and typical hearing milestones is valuable for all parents in the care of their child. Newborn hearing screening allows us to successfully screen for potential hearing loss in infants within the first 24 hours of life. Each screening method (automated ABR or screening OAE) takes about five minutes per ear and is done while the infant sleeps. When the infant does not pass hearing screening, follow-up takes place after discharge from the birthing facility¹ and includes testing to confirm hearing loss, determine the degree of hearing loss, and complete other audiologic procedures. Healthy People 2010 (Health and Human Services) includes the following goal for infants: *to confirm hearing loss by three months of age with appropriate intervention no later than six months of age*. With existing technology and expertise, this goal can be met routinely.

¹ Although the term “hospital” will generally be used in this document, the term includes all licensed birth facilities, not only hospitals.

The process of parent education and the initiation of intervention can occur soon after the infant's birth. A family whose child has a significant permanent hearing loss at birth can be proactive in making decisions about intervention strategies for their child. For example, parents and children adapt more readily to hearing aid use when early identification occurs. Hearing loss, when undetected, impedes the child's speech, language, and cognitive development. Early Hearing Detection and Intervention programs (also referred to as "EHDI") can significantly reduce the need, over time, for special services for the child with hearing loss, and increase the likelihood of attaining age appropriate communication, cognitive, social and emotional development.

Kansas enacted legislation, effective July 1, 1999, to provide for screening for the early detection of hearing loss in newborn infants at the birthing facility or as soon after birth as possible. (Appendix A.) Follow-up referrals for those infants who do not pass the screening enable the infants and their families/caregivers to obtain evaluation, treatment, and intervention services at the earliest opportunity to prevent or mitigate the developmental delays and academic failures associated with late identification of hearing loss. The rationale for hearing screening includes the following points:

- ★ Hearing loss occurs in newborns more frequently than any other health condition for which newborn screening is currently required (*e.g.*, PKU, galactosemia).
- ★ Early detection of hearing loss in an infant and early intervention and treatment before six months of age has been demonstrated to be highly effective in facilitating a child's development in a manner consistent with the child's age and cognitive ability.
- ★ Eighty percent of a child's ability to learn speech, language and related cognitive skills are established by the time the child is 36 months of age, and hearing is vitally important to the development of oral language skills.
- ★ Children of all ages can receive reliable and valid hearing screening which will reduce public expenditure for health care, special education, and related services.

With the implementation of the *Newborn Infant Hearing Screening Act*, K.S.A. 65-1,157a, all newborns in Kansas will have their hearing screened, preferably prior to discharge from the birthing facility. The birthing facility is the most efficient and cost-effective environment for newborn hearing screening. The infant is readily available and qualified personnel are available to provide screening. Audiologists can train and direct other health care personnel in the implementation of a newborn hearing screening program.

II. TECHNOLOGIES FOR NEWBORN HEARING SCREENING PROGRAMS

Currently, newborn hearing screening programs utilize two technologies, in combination or alone, to objectively assess the physiologic status of the ear to screen hearing: Auditory Brainstem Response (ABR) and Otoacoustic Emissions (OAE). **The type of screening technology, in combination with the screening protocol, can affect the referral rate.**

Prior to the purchase of hearing screening equipment, an audiologist should be consulted to provide guidance on which equipment to purchase and to assist in the development of hearing screening protocols. The screening technology which is best for your facility is based on many factors including:

- Number of deliveries per year
- Length of a hospital stay
- Availability of trained staff
- Ability to get families to return for outpatient screening
- Availability of funding to purchase more than one type of screening equipment

Auditory Brainstem Response (ABR)

ABR is an electrophysiological measure of the auditory system's response to sound. A soft (low level) click is presented to the ear through an earphone. Surface electrodes, placed on the infant's head, record the response as the signal travels from the ear through the auditory nervous system to the brain. Hearing screening, using ABR systems that require interpretation of waveforms, must be performed and interpreted by a licensed audiologist or by qualified physicians. It is recommended that the screening level be 35 dB nHL or softer.

Automated ABR (AABR) uses technology similar to ABR except the equipment is fully automated and elicits a pass/refer result. An audiologist is not required for interpretation of these screening results; trained hospital personnel (*e.g.*, nurses, hospital technicians, support staff) can perform the AABR screening.

Otoacoustic Emissions (OAE)

OAE's reflect the integrity of the sensory cells in the cochlea (inner ear). A soft click is presented through a small probe placed in the infant's ear canal. The probe measures the echo that is returned from the infant's cochlea. The echo is analyzed to determine how well the inner ear is working. There are two types of OAE technologies: Transient Evoked Otoacoustic Emissions (TEOAE), and Distortion Product Otoacoustic Emissions (DPOAE). Screening parameters should be set to screen for a "significant" degree of hearing loss (30 dB HL).

Screening OAE equipment is also available. These types of devices have automated scoring of response, consequently allowing trained hospital personnel (*e.g.*, nurses, hospital technicians) to perform screening. A licensed audiologist must interpret OAE systems that do not yield pass/refer results.

III. SUGGESTED NEWBORN HEARING SCREENING PROTOCOLS

It is essential that there be formal hearing screening protocols that are followed closely. Formal protocols will usually be in policy format for the hospital.

The purpose of any screening program is to identify the population that needs to have more in-depth (diagnostic) testing. The screening protocol(s) that will be used in any given hospital will vary according to the screening equipment and personnel doing the screening. A two-step screening process (a second hearing screening for infants who do not pass the first birth admission screening) prior to hospital discharge is recommended. This two-step process is considered "the initial hearing screening." The purpose of the second screening prior to hospital discharge is to reduce the overall referral rate for follow-up testing. **Using this two-step "initial hearing screening" process prior to hospital discharge, typical referral rates using AABR are 2-3%, and using OAE are 6-10%.**

Informed Consent

Most hospitals ask that blanket consent for treatment be signed at admission. This type of consent includes the newborn hearing screening. It is important that parents are given information in advance (*e.g.*, in preadmission packet, at prenatal classes, in admission packet) about the hearing screening process. The law states that if parents object to the screening, their child is exempt from the screening. A birthing facility should have a standardized form available for the parents to sign if consent for hearing screening is not given; the signed form should be retained by the hospital as a medical record for that infant.

Initial Hearing Screening (Prior to Hospital Discharge) Stage One

1. Screen All Infants if Medically able
2. Notify the infant's primary care physician of the infant's hearing screening results (both pass and did not pass/refer results) based on facility protocol.
3. Give all parents information about their child's hearing screening results and the role of hearing in the infant's development. (See Initial Hearing Screening, Pass Results)
4. If the infant needs to be referred for further testing, give parents information about the importance of an outpatient hearing screening, and, with permission of the family, the hospital may assist the family and the primary care physician with scheduling the outpatient screening appointment. (See Initial Hearing Screening, Refer Results)
5. Report **all** Initial Hearing Screening results to KDHE.

Pass Results

The parents of infants who pass the hearing screening should receive information about hearing, speech and language developmental milestones, and information regarding risk indicators for progressive and delayed-onset hearing loss (Appendix B). The information should also include that if, at any point in the infant-toddler-child's development, the parents or the primary care physician suspect a hearing loss, the child should be referred for audiologic services even if the newborn passed the initial hearing screening process.

Refer Results

The parents of infants who did not pass the screening test should be given information regarding: a) the hearing screening process; b) the role of hearing in the infant's development; c) factors that may cause a referral for further hearing testing (*e.g.*, debris in the ear canal, fluid in the middle ear) and d) the importance of further testing.

Outpatient Screening Stage Two

In order to achieve the Healthy People 2010 goal of confirmation of hearing loss by three months of age, the outpatient screening should be completed **no later than 30 days of age**.

1. Outpatient Screening at Hospital, Outpatient Clinic or Office
2. Notify the infant's primary care physician of the infant's hearing screening results (pass, did not pass/refer or missed appointment).
3. Give parents information about their infant's hearing screening results and the role of hearing in infant development.
4. If the infant does not pass the outpatient screening:
 - a) the outpatient facility shall give parents a list of professionals who identify themselves as capable of providing diagnostic audiologic testing;
 - b) the outpatient facility and/or primary care physician may assist the parents in obtaining referral for diagnostic audiologic testing; and
 - c) the outpatient facility and/or primary care physician may assist families by identifying state or community resources available for assistance in the evaluation process.²
5. Report **all** outpatient hearing screening results to KDHE.

²The family's insurance may cover hearing assessment for the infant. Other state resources include Services for Children with Special Health Care Needs; Medicaid for eligible infants; and Infant-Toddler Services (a community-based early identification and intervention program for infants and toddlers [Part C of the Individuals with Disabilities Education Act, IDEA]) which helps families access audiologic diagnostic services, and if a hearing loss is confirmed, multi-disciplinary services (evaluation and intervention) to meet the individualized needs of the child and family. For further information on resources, call the Make a Difference Information Network at 1-800-332-6262 V/TTY, or contact the Kansas Commission for the Deaf and Hard of Hearing at 1-800-432-0698 V/TTY.

Pass Results

The parents of infants who pass the hearing screening at any stage (initial hearing screening or outpatient screening) should receive information about hearing, speech and language developmental milestones, and information regarding risk indicators for progressive and delayed-onset hearing loss (Appendix B). The information should also include that if, at any point in the infant-toddler-child's development, the parents or the primary care physician suspect a hearing loss, the child should be referred for audiologic services even if the newborn passed the hearing screening process.

Refer Results

The parents of infants who did not pass the screening test should be given information regarding: a) the hearing screening process; b) the role of hearing in the infant's development; c) factors that may cause a referral for further hearing testing (*e.g.*, debris in the ear canal, fluid in the middle ear); and d) the importance of further testing.

Missed Appointments

The hearing screening program Manager/Coordinator or designee should contact all families who do not return for a follow-up appointment, carefully documenting at least two contacts to schedule the hearing screening appointment (*e.g.*, by phone and by mail). The infant's primary care physician should be notified after the second missed appointment, or after two unsuccessful contacts to schedule the second appointment.

NICU / Medically Fragile Infants

Infants who are transferred immediately after birth to the NICU at another hospital generally will not have had their hearing screened prior to hospital transfer. It is the responsibility of the facility that releases the infant **to the home** to ensure that the initial and/or outpatient hearing screening have been completed and that the results are reported to KDHE.

Specific NICU hearing screening protocols should be developed at facilities that serve this population. Infants who are transferred from one facility to another may have more than one hearing screening due to the changing health status of the infant.

When Hearing Loss Is Confirmed

The primary care physician works with parents and other healthcare professionals in the coordination of care for infant's identified with hearing loss. Once the diagnosis has been confirmed, the primary care physician should be directly involved in assisting families in identifying state and community resources available for assistance in preparing treatment plans needed to meet the individualized needs of the infant and family.

IV. HOSPITAL AND MANAGER/COORDINATOR RESPONSIBILITIES IN NHS PROGRAMS

Each hospital should designate a physician to oversee the medical aspects of the program.

In addition, an on-site Manager/Coordinator of the Newborn Hearing Screening program, at **all** birthing facilities, regardless of whether screening or not screening, should be responsible for the following:

1. Provide information regarding the Newborn Hearing Screening Program to hospital administration, KDHE, insurance companies, physicians, parents, outside agencies, etc., and
2. Write and implement a hospital policy for the Newborn Hearing Screening program in consultation with the hospital's medical director, consulting audiologist, OB Nurse manager, and others.

The on-site Manager/Coordinator of the Newborn Hearing Screening program at birthing facilities **where newborn hearing screening is provided** should be responsible for the following:

1. Budget for necessary equipment and supplies;
2. Coordinate/supervise personnel providing screening including ongoing monitoring of competency;
3. Provide for training of all screening personnel (see Chapter VII);
4. Provide for care and accurate operation of equipment, and ordering of supplies;
5. Assess the performance of the program on a regular basis; and
6. Oversee data management and transfer of data as required.

V. AUDIOLOGIST RESPONSIBILITIES IN NHS PROGRAMS

The audiologist associated with the Newborn Hearing Screening program may be on staff at the hospital or a consultant for the program. The supervising/consulting audiologist must be licensed by the State of Kansas (KDHE; Health Occupations Credentialing Program), should have professional experience in performing hearing screening on newborn infants, and be experienced in both the development and maintenance of a newborn hearing screening program including an understanding of technology options. It is essential that support personnel receive competency-based training and that their performance in the areas specific to their defined job be reviewed. Routine supervision and continuing education activities should be regularly scheduled and documented.

The responsibilities of the audiologist include the following:

1. Work with the program Manager/Coordinator to ensure the success of the newborn hearing screening program;
2. Recommend screening equipment to the program Manager/Coordinator based on current equipment availability and performance information;
3. Work with the program Manager/Coordinator to develop program implementation policy and procedures including:
 - a) performing the newborn hearing screening;
 - b) ordering appropriate supplies necessary for accurate screening;
 - c) documenting results;
 - d) making referrals;
 - e) providing information to parent/caregiver;
 - f) communicating screening results to parent/caregiver and primary care physician; and
 - g) developing a back-up hearing screening plan to ensure continuation of newborn hearing screening services when screening equipment malfunctions;
4. Outline a process for periodic review of the competency of screeners;
5. Review data to monitor the performance of the screening program including referral rates and competency of screening personnel; and
6. Provide information, training and technical assistance as needed.

VI. PRIMARY CARE PHYSICIAN RESPONSIBILITIES IN NHS PROGRAMS

The infant's primary care physician (PCP), or the primary health care provider such as the local health department, plays an integral role in the newborn hearing screening program. The PCP should receive the results from all hearing screenings. If the family had not selected a PCP at the time the infant was discharged from the hospital, then at the time of the infant's regular well baby checkup, the PCP should contact the birthing facility to obtain hearing screening results for review.

If the newborn infant did not pass the hearing screening, the PCP should:

1. Work with the family to ensure that the infant has timely audiologic follow-up;
2. Be knowledgeable about community resources that can help the family obtain the outpatient screening or the audiologic assessment;
3. Issue a referral for an audiologic assessment and, depending on the outcome, a referral for an ENT assessment;
4. Expect the referral agent(s) to share the results of the assessments;
5. Be aware that the PCP of record will receive notice from KDHE regarding hearing screening results, and data will be housed at KDHE;
6. Be aware that the goal of the Newborn Hearing Screening program is that of Healthy People 2010, the Maternal and Child Health Bureau, and the Centers for Disease Control and Prevention: all newborn infants are screened for hearing loss prior to hospital discharge or at least by one month of age, those referred have audiologic evaluation by age three months, and, if a hearing loss is confirmed, are enrolled in appropriate intervention services by age six months.

Regardless of whether the infant passed or did not pass the hearing screening, the PCP should be aware of the risk indicators for hearing loss (Appendix B), and monitor for delayed-onset, progressive and acquired hearing loss during routine medical care.

VII. SUPPORT PERSONNEL IN NHS PROGRAMS

This section is intended specifically for support personnel in *newborn hearing screening*. The information does not replace requirements for Audiology Assistants as set forth in regulation by the Kansas Department of Health and Environment (KDHE), nor does it replace the Hearing Screening Guidelines developed by the Kansas State Department of Education (KSDE) and KDHE.

Support personnel are individuals who are selected and trained to operate devices used to screen the hearing of newborns. Support personnel may include nurses, audiology assistants, technicians, health care assistants, other allied health personnel, and other persons specifically trained to screen newborns for hearing loss. The roles of the support personnel should be clearly defined.

Minimum Qualifications of Support Personnel

- Eighteen years of age or older
- High school diploma or equivalent
- Works independently to complete specified procedures consistently
- Demonstrates competency-based skills necessary to perform the specific tasks assigned
- Communicates and interacts with hospital staff, medical staff, and parents reliably and maturely
- Meets the physical demands of the screening process
- Follows a precise sequence of instructions for the screening protocol
- Handles and operates electrical equipment safely
- Applies small objects safely to infant ears and head
- Free of communicable diseases; immunizations current
- Follows hospital policies, regulations and procedures

Training of Support Personnel

A formal training program for support personnel should be in place under the direction of the supervising/consulting audiologist or qualified physician. The content of the training program should exceed basic instruction in the operation of the screening equipment and should address all aspects of screening responsibilities. Specific competency-based training through formal instruction and supervised practice should be included. Individual observation/assessment to determine the ability of the support person to perform duties associated with newborn hearing screening safely and competently should be completed with documentation. Personnel should have ongoing assessment of proficiency and retraining as needed.

Areas of training should include, but are not limited to:

- Basic anatomy and physiology of the ear
- Nature of the responses being measured
- Patient and non-patient factors that influence responses
- Understanding and completing screening procedures, including documentation of screening
- Understanding and use of specific equipment including screening instruments and computers
- Patient Bill of Rights
- Confidentiality requirements
- Effective communication skills to provide accurate and appropriate information
- Safety and infection control procedures, including universal precautions for blood-borne pathogens and tuberculosis according to guidelines of the Occupational Safety and Health Association (OSHA)
- Hospital and nursery emergency procedures
- Risk management and incident reporting procedures

Duties and Responsibilities of Support Personnel

Duties and responsibilities of support personnel may vary according to the facility. Suggested duties and responsibilities **may** include the following items:

- Reporting to the nursery at scheduled time to perform screenings
- Selecting and preparing infants for screening based upon program policies and nursery requirements
- Operating a screening device according to manufacturer's instructions and instructions received in the training program
- Recording results of screening and disseminating information to appropriate personnel
- Performing daily equipment checks and maintaining equipment in good condition
- Notifying program supervisor of low supplies and equipment problems
- Maintaining strict patient confidentiality
- Wearing hospital identification at all times
- Following strict guidelines for patient/parent identification
- Completing records and logs as required
- Interacting appropriately with infants, parents, and other caregivers
- Cleaning and disposing of supplies for screening, observing infection control procedures

Support personnel **may not** engage independently in the following activities:

- Interpreting screening results or clinical data
- Referring a patient's family to other professionals or agencies without a clear protocol established by the program Manager/Coordinator and physician

VIII. DATA MANAGEMENT IN NHS PROGRAMS

Data management is essential to achieve a successful Newborn Hearing Screening program. It provides a mechanism for tracking infants from the hospital screening to the infant's primary care physician (medical home), to the audiologist, and to agencies that provide early intervention. Results of data analysis provide a mechanism to compare the program outcomes to quality indicators. Data should be readily available to provide information to other professionals involved in the process of identifying infants with hearing loss, and should be analyzed on a monthly, quarterly and yearly basis. Data that are essential to manage the NHS program include the following:

1. Number of live births
2. Percent and number of infants screened prior to hospital discharge
3. Percent and number of infants not screened prior to hospital discharge
4. Reasons infants' hearing was not screened
5. Percent and number of infants who pass the initial screening
6. Percent and number of infants who are referred for outpatient screening after the initial screening
7. Percent and number of infants who were not screened and were scheduled for outpatient screening

If possible, the following information should be tracked by the Program Manager/Coordinator:

8. Percent and number of infants seen for outpatient follow-up screening
9. Percent and number of infants who passed follow-up screening
10. Percent and number of infants who were referred for diagnostic audiologic evaluation
11. Number of infants who returned for diagnostic audiologic evaluation
12. Number of infants with confirmed hearing loss

Data management can occur by utilizing computer-based hearing screening data management systems that allow for collection of the above information as well as data regarding the performance of screening personnel. If a computer-based hearing screening data management system is used, the information should be backed up on a regular basis. Commercial computer-based hearing screening data management systems currently available for monitoring and tracking are compatible with only some types of equipment.

For smaller hospitals, it is possible to keep track of all necessary information using a paper and pencil system or software on a computer. These types of data management systems require close attention to assure the accuracy of the needed information.

Hospital Newborn Hearing Screening Program Goals:

1. 100% of infants with parental consent receive a hearing screening
2. Using AABR, the percent of well-baby infants referred for further testing should be no more than 4%.
3. Using screening OAE, the percent of well-baby infants referred for further testing should be no more than 6-10%.
4. 100% of the attempts to achieve follow-up on referrals are documented
5. Within one year of implementation, the newborn hearing screening program should achieve a 95% or better follow-up rate for those who are referred.

IX. COMMUNICATION: PHYSICIAN, FAMILY, and HOSPITAL DOCUMENTATION

The hearing screening results must be communicated effectively. Following hearing screening, there are three primary settings where communication is of significant importance.

Newborn's Primary Care Physician

A. Hospital to Physician:

There should be a letter or copy of the hospital documentation record of the hearing screening sent to the infant's primary care physician. Physicians should also be notified if the infant's hearing was not screened, and when appointments for outpatient hearing screening were missed. Facilities may choose to provide monthly lists of infants screened and results.

B. Physician to Family:

Listed below are frequently asked questions about infant hearing screening

· *Why should a baby's hearing be screened?*

In general, approximately 3-4 of every 1000 newborns are identified with hearing loss, and at least 50% of these infants have no risk indicators for hearing loss. The average age of identification of hearing loss without universal newborn hearing screening is 2.5 years.

The earlier hearing loss is confirmed, the earlier help can be provided. The goal of Healthy People 2010, as well as the American Academy of Pediatrics, is that all infants with hearing loss will be identified by three months of age, and intervention services will begin by six months of age.

Early Hearing Detection and Intervention (EHDI) consists of three major components: the hearing screening prior to hospital discharge, the follow-up assessment(s), and intervention (e.g., assistive devices, therapies).

· *Is newborn hearing screening the "Standard of Care?"*

The State of Kansas, along with 31 other states at this time (August 2000), mandates newborn hearing screening. Families, professional organizations, and government agencies have recognized the importance and benefits of early detection, diagnosis and intervention of hearing loss through the implementation of newborn hearing screening programs.

- *Does a passed newborn hearing screening mean there is no need for ongoing monitoring of the infant's hearing?*
A passed initial hearing screening does not exclude the need to assess for progressive, delayed-onset or acquired hearing loss from causes such as jaundice, meningitis, serous otitis, familial progressive hearing loss, CMV infection, head trauma, etc. See Appendix B for risk indicators.
- *When the hearing screening results are pass for one ear and refer for the other ear, should the parent follow-up with further hearing assessment for the infant?*
The infant should be referred for another hearing screening or assessment. Unilateral hearing loss has a potential impact on speech and language development, and amplification, if preferred by the family, may have a role in maximizing language development.
- *When a hearing loss is confirmed, can the cause always be determined?*
Most congenital hearing loss is hereditary; nearly 200 syndromic and nonsyndromic forms have been identified. However, the etiology of newborn hearing loss may remain uncertain in 30%-40% of children (JCIH Year 2000 Position Statement).

C. Physicians' frequently asked questions:

- *Can effective newborn infant hearing screening be completed prior to hospital discharge?*
Many programs have been successful at screening 100% of births prior to hospital discharge.
- *What is an acceptable referral rate?*
Using AABR, the percent of well-baby infants referred for further testing should be no more than 4%. Using screening OAE, the percent of well-baby infants referred for further testing should be no more than 6-10%.
- *Would it be more effective to screen hearing in the office of the infant's Primary Care Physician?*
At this time, a sufficient number of physicians' offices do not have the equipment nor trained personnel to accomplish the goal of identification of hearing loss at the level that can be accomplished in a hospital-based program. Moreover, not all infants routinely see physicians for well-baby care.

- *Do parents of infants who are referred for further hearing screening experience undue anxiety?*
When there is communication to reduce the parent's apprehension and provide information through effective educational materials and counseling, both at the time of screening and at the physician's office, undue parental anxiety has not been an issue.
- *When an infant has not passed the hearing screening, are there any tests that might be completed by the primary care physician?*
Testing for in-utero infections (e.g., CMV) may be completed. For further information, see the [Medical Assessment Guidelines for Infants with Confirmed Hearing Loss](#).
- *What types of hearing losses are identified in the follow-up audiologic assessment?*
75-80% of infants have bilateral hearing loss; 20-25% have unilateral hearing loss. 78% of infants with bilateral hearing loss have mild to moderate hearing loss; 22% have a severe to profound degree of hearing loss.
- *When a hearing loss is confirmed, what are the next steps?*
Other evaluations, in addition to audiologic assessment, may be recommended (e.g., otology; ophthalmology; genetics). Early intervention (assistive devices and therapies) may be recommended. Early and consistent intervention (including amplification if preferred by the family) is essential to achieving language development consistent with the child's age and cognitive ability. For further information, see [Kansas Guidelines for Infant Audiologic Assessment](#), the [Kansas Medical Assessment Guidelines for Infants with Confirmed Hearing Loss](#) and [A Kansas Resource Guide For Families with Infants and Toddlers who are Deaf/Hard of Hearing](#).

Hospital to Family Communication

In communicating screening results to parents it is important that they know if the child passed or was referred for additional testing. It is just as important that parents know what the screening results mean and what they need to do next. The best time to communicate the screening results is immediately following the screening so questions can be answered immediately. Physician input regarding the preferred way to inform parents at the screening facility is encouraged.

Communication to the family should include information in as many different forms as possible. Possible forms of communication include:

- brochures or pamphlets that have a space to record screening results and provide information about speech-language and auditory developmental milestones
- cards or forms to schedule follow-up appointments, and
- letters sent to parents who missed the rescreening appointment

Hospital Documentation

It is important to make sure that the screening results are documented in the permanent hospital medical record. Depending on the personnel who are conducting the actual screening, documentation requirements will vary.

Essential factors include:

- Point of service documentation of screening completion, scheduling for initial screening as an outpatient, or scheduling for outpatient follow-up screening
- Nursing discharge plan includes hearing screening
- Documentation of parent education regarding hearing screening
- Specific documentation that parents did not consent to the hearing screening; the signed form should be retained by the hospital as a medical record for that infant

X. NHS GUIDELINES FOR HOSPITALS WITH LOW BIRTH NUMBERS

According to the statute enacted by the legislature of the State of Kansas, every child born in the state of Kansas shall be given a hearing screening within three to five days following birth unless a different time period is medically indicated (K.S.A.65-1,157a).

All hospitals are encouraged to provide newborn hearing screening prior to hospital discharge. It is recognized that some birthing hospitals with small numbers of births may have difficulty providing newborn hearing screening. Those hospitals having fewer than 75 births per year (a three-year average), and that choose not to provide hearing screening prior to discharge, should identify a facility to provide hearing screening on an outpatient basis. The initial hearing screening should be scheduled prior to hospital discharge. **The sending hospital should have a written agreement with the receiving facility that defines the responsibilities of each facility including which facility is responsible for tracking and follow-up and for submitting the required data to KDHE.** The KDHE Initial Newborn Hearing Screening Report form can be used for patient tracking purposes (Appendix C). (See Section XI, Reporting Requirements for NHS Programs, for reporting data to KDHE.)

Suggested Sending Hospital Responsibilities

1. Provide the parents with information regarding the importance of early detection of hearing loss, hearing, speech and language developmental milestones, and information regarding risk indicators for progressive and delayed-onset hearing loss.
2. Make an appointment for the infant hearing screening with the screening facility and provide a copy of the Newborn Hearing Screening Report form to the parents, the infant's primary care physician, and the screening facility.
3. Follow-up with the screening facility to obtain completed Newborn Hearing Screening Report form.
4. Obtain signed permission/release of information form to allow the sharing of information.

Suggested Outpatient Newborn Hearing Screening Facility Responsibilities:

1. Report hearing screening results to the parents, physician, KDHE and the birthing facility by completing the Newborn Hearing Screening Report form.
2. Follow-up on missed appointments for the initial screening appointment.

3. Assist the parent in making an appointment for follow-up audiologic assessment for infants who do not pass the hearing screening process by providing names of professionals who identify themselves as capable of providing diagnostic audiologic testing.
4. Provide information to families on the available state or community resources to assist in the evaluation process.

Pass Results

The parents of infants who pass the hearing screening at any stage (initial hearing screening or outpatient screening) should receive information about hearing, speech and language developmental milestones, and information regarding risk indicators for progressive and delayed-onset hearing loss (Appendix B). The information should also include that if, at any point in the infant-toddler-child's development, the parents or the primary care physician suspect a hearing loss, the child should be referred for audiologic services even if the newborn passed the hearing screening process.

Refer Results

The parents of infants whose screening results refer the infant for further testing should be given information regarding: a) the hearing screening process; b) the role of hearing in the infant's development; c) factors that may cause a referral for further hearing testing (*e.g.*, debris in the ear canal or fluid in the middle ear); and d) the importance of further testing.

Missed Appointments

The hearing screening program Manager/Coordinator or designee should contact all families who do not return for a follow-up appointment, carefully documenting at least two contacts to schedule the hearing screening appointment (*e.g.*, by phone and by mail). The infant's primary care physician should be notified after the second missed appointment, or after two unsuccessful contacts to schedule the second appointment.

XI. REPORTING REQUIREMENTS FOR NHS PROGRAMS

The Kansas Department of Health and Environment (KDHE) will develop a system of reporting NHS program data to the state. Screening status and screening results will be reported on the birth certificate, either electronically (Electronic Birth Certificate System or “EBC”) or as the non-EBC hospital transmits birth certificate data to the state (*e.g.*, by fax or mail). Use of the birth certificate for newborn hearing screening data will eliminate duplication of data entry and facilitate accurate tracking.

The additional data elements on the birth certificate will include the following information:

- Was screening accomplished (yes/no)
- If screening was accomplished:
 - Date
 - Right ear results (pass/refer)
 - Left ear results (pass/refer)
- If screening was not accomplished, reason (using a coding system):

b: missed appointment	o: other
c: could not test	r: did not consent
d: deceased	s: scheduled
i: incomplete test	t: transferred
m: infant discharged before screening	u: no information
n: NICU	x: invalid results
- Name of infant’s primary care physician

For those infants in newborn intensive care units (NICU), whose birth certificate is transmitted to the state before it is medically recommended to screen hearing, the Newborn Hearing Screening Report form (Appendix D) will be used. Data can be transmitted via secure Internet, by fax or by mail. KDHE will implement a follow-up program similar to the program for newborn screening for genetic/metabolic conditions (*e.g.*, PKU, galactosemia, etc).

XII. TRANSITION TO ASSESSMENT

The outcomes of a successful early hearing detection and intervention (EHDI) program are that

a) all infants with hearing loss are identified as soon as possible, preferably within three months of age; and b) infants with confirmed hearing loss begin receiving early intervention services, as appropriate for the child and family, as soon as possible and preferably by six months of age.

Hospital personnel should be knowledgeable about facilities that can provide follow-up outpatient infant hearing screening, and facilities that can provide a complete audiologic assessment for infants. Follow-up of newborns who have not passed the initial hearing screening to assure that appropriate additional screening has taken place is essential to meet the needs of the child and family.

Additional documents in the SoundBeginnings program include the [Kansas Guidelines for Infant Audiologic Assessment](#), [Kansas Medical Assessment Guidelines for Infants with Confirmed Hearing Loss](#), [Kansas Guidelines - Amplification for Infants](#), and [A Kansas Resource Guide for Families with Infants and Toddlers who are Deaf/Hard of Hearing](#). Additional information can be obtained by contacting:

The Make a Difference Information Network (1-800-332-6262 V/TTY)

SoundBeginnings at KDHE (1-800-332-6262 V/TTY)

Infant-Toddler Services at KDHE (1-800-332-6262 V/TTY)

The Kansas Commission for the Deaf and Hard of Hearing (1-800-432-0698 V/TTY)

The community's local Infant-Toddler Early Intervention Network

The local Health Department

REFERENCES

This document was prepared using resources from numerous sources. There has been tremendous support from across the country in the sharing of information to assist in the development of newborn hearing screening. The following reference materials were crucial in the preparation of this document.

American Academy of Audiology. (1998). Draft: Use of support personnel for newborn hearing screening. *Audiology Today, Special Issue*, 21-23.

Finitzo, T., & Crumley, W. (1999). The role of the pediatrician in hearing loss. In N. J. Roizen & A. O. Diefendorf (Eds.), *Pediatric Clinics of North America*, 46, 15-34.

Joint Committee on Infant Hearing (1995b). Joint Committee on Infant Hearing 1994 Position Statement, *Pediatrics*, 95,(1), 152-156 .

Joint Committee on Infant Hearing (2000). Year 2000 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. *American Journal of Audiology*, 9, 9-29.

Marion Downs National Center For Infant Hearing

National Center for Hearing Assessment and Management

National Institute on Deafness and Other Communications Disorders. (1993, March 1-3). *National Institutes of Health Consensus Statement: Early identification of hearing impairment in infants and young children*. Bethesda, MD: Author.
http://odp.od.nih.gov/consensus/cons/092/092_intro.htm

Sounds of Texas Project

The State of Colorado Newborn Hearing Screening Guidelines.

WEB SITES for NEWBORN HEARING SCREENING

There are many web sites that address the variety of topics included in “newborn/infant hearing screening” (*e.g.*, legislation; effects of hearing loss; hearing screening equipment; status of states’ newborn hearing screening programs). Listed below are examples of web sites to facilitate a search for information.

www.infanthearing.org

www.colorado.edu/slhs/mdnc

www.cdc.gov/nceh/info/programs.htm

www.hrsa.dhhs.gov

www.asha.org/infant_hearing

www.aap.org

www.audiology.org

APPENDIX A

KANSAS STATUTES

65-1,157a

Chapter 65.--PUBLIC HEALTH

Article 1.--SECRETARY OF HEALTH AND ENVIRONMENT, ACTIVITIES

65-1,157a. Newborn infant hearing screening; informed consent; confidentiality of information; application for and receipt of grants; rules and regulations. (a) This act shall be known as the newborn infant hearing screening act.

(b) Every child born in the state of Kansas, within three to five days for normal births and five to eight days for premature births following birth, unless a different time period is medically indicated, shall be given a screening examination for detection of significant hearing loss. The screening shall be conducted in accordance with accepted medical practices and in the manner prescribed by the secretary of health and environment.

(c) Informed consent of parents shall be obtained and if any parent or guardian of a child objects to the mandatory examination for detection of significant hearing loss the child is exempt from subsection (b) of this section.

(d) Information obtained by the secretary of health and environment under this section shall be confidential and shall not be disclosed except to notify the primary care physician and the parents or guardian of the child of the screening results.

(e) The secretary of health and environment may make application for and receive grants or other moneys which may be available from the federal government for newborn hearing screening and may enter into cooperative agreements with the federal government relating to newborn hearing screening.

(f) The secretary of health and environment shall adopt such rules and regulations as may be necessary to carry out the provisions of this section.

History: L. 1999, ch. 92, § 1; July 1.

APPENDIX B RISK INDICATORS FOR HEARING LOSS

From the Joint Committee on Infant Hearing *Year 2000 Position Statement*

Risk Indicators: Birth through age 28 days where universal newborn hearing screening is not mandated

This information should be used by all primary health care providers (*e.g.*, physicians, local health department personnel) to assess risk status for hearing loss during the well-baby visit.

- an illness or condition requiring admission of 48 hours or greater to a NICU
- stigmata or other findings associated with a syndrome known to include a sensorineural and/or conductive hearing loss
- family history of permanent childhood sensorineural hearing loss
- craniofacial anomalies, including those with morphological abnormalities of the pinna and ear canal
- in-utero infection such as cytomegalovirus (CMV), herpes, toxoplasmosis, or rubella

Risk Indicators: For use with infants (29 days through 2 years) when the newborn hearing screening test was passed

Passing the newborn hearing screening does not mean that the child will not develop or acquire a hearing loss. The presence of any of these risk indicators for progressive or delayed-onset sensorineural hearing loss and/or conductive hearing loss denotes the need to provide audiologic monitoring every 6 months until age 3 years.

- parental or caregiver concern regarding hearing, speech, language, and or developmental delay
- family history of permanent childhood hearing loss
- stigmata or other findings associated with a syndrome known to include a sensorineural or conductive hearing loss or eustachian tube dysfunction
- postnatal infections associated with sensorineural hearing loss including bacterial meningitis
- in-utero infections such as cytomegalovirus, herpes, rubella, syphilis, and toxoplasmosis
- neonatal indicators - specifically hyperbilirubinemia at a serum level requiring exchange transfusion, persistent pulmonary hypertension of the newborn associated with mechanical ventilation, and conditions requiring the use of extracorporeal membrane oxygenation (ECMO)
- syndromes associated with progressive hearing loss such as neurofibromatosis, osteopetrosis, and Usher's syndrome
- neurodegenerative disorders, such as Hunter syndrome, or sensory motor neuropathies, such as Friedreich's ataxia and Charcot-Marie-Tooth syndrome
- head trauma
- recurrent or persistent otitis media with effusion for at least 3 months