HACKETTSTOWN REGIONAL MEDICAL CENTER

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NEWBORN
(Scope)

TITLE: NEWBORN HEARING SCREENING PROGRAM

PURPOSE: To describe the rationale, the program, and the responsibilities for screening the hearing of all newborns admitted to the Hackettstown Regional Medical Center Nursery. This includes hospital births and newborns born outside the facility and admitted to the Nursery.

LEVEL: Interdependent

SUPPORTIVE DATA: New Jersey State Law P.L. 2001, c.373 requires that all newborns receive a physiologic hearing screening prior to discharge from a birthing facility, or no later than one month of age. The purpose of newborn hearing screening is to identify infants with congenital or neonatal hearing loss and those who present with risk factors for late onset, progressive or fluctuating loss. The goal of the statewide Early Hearing Detection and Intervention (EHDI) program is to confirm hearing loss by 3 months of age and implement interventions by 6 months of age.

A. Rationale
The incidence of significant permanent hearing loss in infants is one to three infants per 1,000, with an estimated additional three infants per 1,000 with moderate degrees of hearing loss (per American Speech-Language-Hearing Association). The National Center for Hearing Assessment and Management (NCHAM) concurs that three of every 1,000 newborns in the United States have a permanent hearing loss, making hearing loss the most frequently occurring birth defect. (http://www.infanthearing.org/summary/summary.html#prevalence)
Consequences of late identification of hearing loss include delayed speech and language development and associated effects on social and emotional growth and academic achievement. Advances in technology have made it possible to detect the presence of hearing loss in the neonatal period.
Research has demonstrated that infants with hearing impairment have significantly better language outcomes when they are identified early (by six months of age) versus late. When early detection of hearing loss is coupled with the provision of effective early intervention, the impact of the hearing loss on language and other areas of development may be lessened.

B. Definition of Hearing Loss
The newborn hearing screening regulations define hearing loss as a permanent unilateral or bilateral hearing loss of at least 30 to 40 dB HL in the frequency range important for speech recognition and comprehension (500-4000 Hz).

C. Newborn Hearing Screen Definition and Technique
Newborn hearing screening is defined by regulation as the use of an objective measurement of the auditory system to identify infants at risk for hearing loss. The objective measure used for newborn hearing screening at HRMC Childbirth Family Center is the automated auditory brainstem response (AABR). Using AABR, electrodes are attached to the baby's forehead and mastoid areas, and earphones over the ears. Sounds are introduced through the earphones and the response from the baby's auditory system is recorded.

D. Personnel
A multidisciplinary team is responsible for establishing and monitoring the newborn hearing screening program. The team is comprised of a physician, registered nurses, OB Technicians, and an audiologist.

The Chief of the Department of Pediatrics oversees the medical aspects of the newborn hearing screening program. Dr. Jagdish Chugh, acting Chief of Pediatrics is the licensed physician who oversees the newborn hearing screening program and ensures implementation of the HRMC protocol.

The Manager/Director of Womens',Services oversees administrative aspects of the program.

The audiologist supervises audiologic aspects of the program and collaborates with the CFC staff on referrals and follow-up.

The OB Educator supervises training and competency aspects of the program.

The CFC staff (including Registered Nurses and OB Technicians) is responsible for the daily testing.

CONTENT:

	Action	Key Points
The goal of the newborn hearing screening program is to ensure that all babies are tested prior to discharge and that screening takes place in a timely fashion to allow inpatient re-screening when indicated.	Nursing staff will provide parents with "Can My Baby Hear" brochure in their primary language.	Any newborn whose parents object to the hearing screening on the grounds that screening would conflict with their bona fide religious tenets or practices are granted exemption from screening. Parental consent for hearing screening is not required. Parents who refuse newborn hearing screening must sign a "refusal of treatment" form. The "refusal of treatment" form must be included in the infant's medical record.
Screening is performed by CFC staff who have been trained in the use of the Algo 5 Newborn Hearing Screener. The screening cart is located in the 4 South Nursery.	Training in the use of the Algo 5 is part of the orientation program for employees (RNs and OB Technicians) in the CFC. Competency is monitored annually	Training materials for the hearing screener are provided by the vendor (Natus) for the Algo 5 Newborn Hearing Screener and are modified per HRMC policies.

	by return demonstration.	
All pediatricians will receive written notification of results of the newborn hearing screening test.	A result label is placed on the Newborn Physical (yellow copy) which is the physician's copy to take for the office file.	Results (printed labels) are placed on the progress note in the Baby chart, on the discharge instruction form for parents, on the back of the yellow copy of Newborn Physical form, and in the Nursery log book.
PROCEDURE STEPS		
	1. **Select a baby appropriate for screening**. Explain procedure to parents and reason for the screening. Inform parent that it is only a screening procedure.	Baby should be recently fed and/or in a quiet, relaxed state. **Baby may be screened any time after 6 hours of age.**
	2. **Set up screener.** a. Switch on power if not already on (3 places). b. Enter patient information. c. Select screening method. *R/L Simultaneous*, right and left ears *Single-ear, right or left ear* (for re-screen if previous refer).	Required patient information: Medical record number Date of birth Last Name Gender (check male or female) Pediatrician Last name User ID (screener's last name) **Risk factors default to "U". Mark any known risk factors on screener as "Y". Mark family history as either "Y" or "N".**
	3. **Prepare baby.** a. Collect supplies. b. Identify and prepare sites for the 3 sensors. c. Connect the colored sensor clips to the sensors. d. Place sensor with attached clip on the baby in the proper locations. e. Check impedance and adjust sensor connections if necessary. (< 12 kOhms) Black clip to Vertex. White clip to Nape. Green clip to shoulder. f. Attach transducers to earphones. g. Place earphones on baby. Blue transducer to Left ear; Red transducer to right ear h. Allow baby to assume restful state (may include feeding).	Make sure newborn's ear canal is clean. Baby should not be sucking on anything. That noise can interfere with test results. Most of the time the baby's skin will not require prepping. Make sure skin is clean and dry before applying tabs and ear cups. If sensors will not stick, can take alcohol wipe and wipe areas that sensors are to stick.
	4. **Run screening procedure.** a. Press F1 to begin screening. b. Observe screening as necessary (may include troubleshooting). c. View results on display and printout.	If both ears "PASS", screening is complete. If one or both ears "REFER", infant may be re-screened immediately or at later time before discharge.
RESULTS/DOCUMENTATION	5. Once test is completed, result	If one or both ears "REFER" after

	will print out on sticker. Print out 3 more stickers. Place one sticker in log book, one sticker in baby's chart on progress notes, and one on back of Newborn Physical yellow copy, and one on Discharge Instructions for parents. Results and risk factors for late onset hearing loss are entered in the EBC in the manner prescribed by the state Registrar of Vital Statistics by the OB Technician and/or RN staff and downloaded weekly.	second attempt at screening, the infant should be referred for outpatient testing at an appropriate facility, such as Hackettstown Audiology or patient's own pediatrician referral. The nurse must check the log book prior to discharge to ensure that the infant was screened and that any necessary referrals have been made.
	6. If referral is needed, notify OB Technician to print a referral letter. (see attached) Pull a pink multipart "Newborn Hearing Follow-Up Report" (form # SCH-2) from file cabinet and complete section Instruct parents that If infant is identified as being at risk for hearing loss (family history or other factors), there must be follow-up even if there is a "Pass" result on both ears.	**Referral letter and pink outpatient screening form will be given or mailed to parents.** Repeat outpatient screening should be performed in an audiology center. **Contact Audiology by faxing copy of baby's face sheet and reason for referral to fax #8701**. The HRMC HIPAA policies and procedures will be followed in communicating any patient-specific information.
CLEANING	7. Wipe cables with hospital approved germicidal product.	Follow all hospital infection control policies for hand washing and other cleaning (see learning objectives for yearly competency).
	8. The CFC nurse will explain the test result to the parents and distribute appropriate literature.	A parent of each newborn will be notified of the screening results in face to face communication as well as in writing (via result label affixed to discharge Instructions). Nursing staff will ask parents for a second point of contact; verify the identity of the primary care provider; and offer to make their appointment with Audiology prior to discharge. Copies of screening results will be faxed to primary care providers.
OUTPATIENT FOLLOW UP	9. Parents of babies needing follow-up must be contacted one time within one month after discharge by phone or mail.	**Families of infants who require follow up will receive another letter or a phone call within one month of discharge to remind them of the need for additional testing**. Letters will be generated by the OB Technician and sent to families identified in the Algo 5 system QA

reports.

10. The "Lost to Hearing Follow-Up Report" (form # SCH-3) will be completed when appropriate. The original is sent to NJDHSS, copy to primary care provider, and copy to infant medical record.

The Lost to Folllow Up form will be submitted when:
The CFC is unable to make the "reminder" contact (disconnected phone or returned mail) and/or any other reason that applies.

OUTCOME

The newborn's parents understand the benefits of hearing screening. Parents of infants at risk and in need of referral will be given appropriate education and will anticipate further communication with their physician and the New Jersey State Department of Health.

Risk Factors for Late Onset Hearing Loss (as defined by the NJ Early Hearing Detection and Intervention Program (per JCIH Statement 10/07) are as follows:
CO = Parental concern* regarding hearing, speech, language, and/or developmental delay
NI= Neonatal Intensive care of more than 5 days.
AV= assisted ventilation
OT=exposure to ototoxic medications (gentimycin and tobramycin) or loop diuretics (furosemide/Lasix).
HB = Hyperbilirubinemia at a serum level requiring exchange transfusion
HX = Family history* of permanent childhood hearing loss
TO= In utero infections, such as CMV* (cytomegalovirus), herpes, rubella, syphilis, and toxoplasmosis (TORCH).
ND=Neurodegenerative disorders*, such as Hunter syndrome or sensory motor neuropathies, such as Friedreich's ataxia and Charcot-Marie-Tooth syndrome, etc.
ST = Physical findings, such as a white forelock, that are associated with a syndrome known to include sensorineural, or permanent conductive hearing loss.
PF= syndromes associated with hearing loss or progressive or late-onset hearing loss*, such as neurofibromatosis, osteropetrosis, and Usher's syndrome: other frequently identified syndromes include Waardenburg Alport, Pendred, and Jervell and Lange-

		Nielson*. MN=Culture-positive postnatal infections associated with sensorineural hearing loss* including confirmed bacterial and viral (especially herpes viruses and Varicella) meningitis. TR=Head trauma, especially basal skull/temporal bone fractures* that requires hospitialization. CR= Crainiofacial anomalies, including those that involve the pinna, ear canal, ear tags, ear pits, and temporal bone anomalies. CH=Chemotherapy *These risk factor indicators are of greater concern for delayed-onset hearing loss.
OTOTOXIC DRUGS	Infants who are treated with an ototoxic drug for five days or more or an ototoxic drug in combination with a loop diuretic, will be referred for audiologic testing every six months until the age of three. Every child admitted under the age of three that receives ototoxic medications (see adjacent column) shall have a hearing screen completed after the discontinuation of the drug(s). For children unable to be screened prior to discharge, parents will be counseled about the need for outpatient audiologic evaluations. The following classes of drugs have been shown to have degrees of fetal ototoxicity: Antimalarials Aminoglycosides	Commonly used medications with ototoxic and also *vestibulotoxic potential. **Aminoglycoside Antibiotics:** Amikacin Gentamycin* Neomycin* Kanamycin Netilmicin Streptomycin* Tobramycin* **Other Antibiotics:** Erythromycin* Vancomycin Chloramphenicol Furazolidione* Polymyxin B and E Trimethoprimsulfamethoxazole **Loop Diuretics:** Ethacrynic acid* Furosemide* Bumetanide* **Salicylates:** Aspirin NSAIDS Adapted from: Seligmann H.;et el. Drug-induced tinnitus and hearing disorders. Drug Safe. 1996; 14(3): 198-212.
EQUIPMENT/EQUIPMENT	The Natus Algo 5 Hearing	The CFC will maintain a

FAILURE	Screener is used in the Newborn Nursery. The system is calibrated by the Bio-Med engineer every October. Any technical problems with the Algo 5 hearing screening equipment will be reported to the Bio-Med Department immediately. Messages may be left on the department answering machine during off shifts and weekend hours. Natus customer service may be contacted at 1-800-255-3901.	warranty/service contract with the vendor of the hearing screening equipment. The Bio-Med engineer will troubleshoot and make adjustments to the equipment when possible. If the screening equipment is non-functional, the Bio-Med department will obtain a loaner screener ASAP to be used while repairs are made. If any infant is not screened before discharge, the infant will be referred to Hackettstown Audiology for the initial screening.
QUALITY ASSURANCE	The Hackettstown Regional Medical Center has procedures to ensure compliance with recommendations with the Joint Committee on Infant Hearing with regard to program benchmarks and quality assurance. In summary, the program will be considered effective if the following criteria are met: 1. At least 95% of babies are screened before discharge. 2. The referral rate for audiologic and medical evaluation following the screening process is 4% or less. 3. The inpatient program, in conjunction with outpatient testing facilities, maintains a return for follow-up rate of at least 70%.	The Algo 5 system QA report will be generated monthly by downloading the hearing screening results to the database maintained on the OB Unit. Data will be analyzed by the program administrator to ensure that the program is achieving expected benchmarks and outcomes. Any component that does not meet criteria will undergo review and modification.
CONFIDENTIALITY OF RECORDS	The reports made are to be used only by the Department and such other agencies as may be designated by the Commissioner and shall not otherwise be divulged or made public so as to disclose the identity of any person to whom they relate. Such reports shall be deemed “information relating to medical history, diagnosis, and treatment or evaluation” within the meaning of	

Executive Order No. 26, & 4b1 (McGreevy, 2002), and therefore not “government records” subject to public access or inspection within the meaning of N.J.S.A. 47:1A-1 et seq., particularly 1A-1.1.

REFERENCES

Joint Committee on Infant Hearing Statement. Revised 2005.

Newborn Hearing Screening Program Handbook. Natus Medical Inc.

N.J. State Department of Health and Senior Services Licensing Standards. 8:43G 19.15 and Chapter 19, Subchapter 1.

NJ Early Hearing Detection and Intervention Program (JCIH Statement 10/07).