UNIVERSAL NEWBORN HEARING SCREENING

A Guide for Professionals

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Why this is important? ????

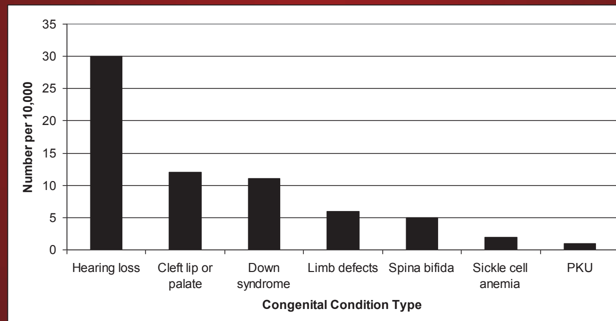
OBJECTIVES

- Learn the goals of the Early Hearing Detection and Intervention program.
- Learn effective ways to train staff on universal newborn screening procedures (UNHS).
- Learn the outcomes of ineffective UNHS training.
- Learn about resources for UNHS.

HEARING LOSS STATISTICS

- 3 in 1000 babies are born with hearing loss
- NICU
  - 1 to 2 babies in 100 births are born with hearing loss

#1 BIRTH DEFECT



http://www.infanthearing.org

JOINT COMMITTEE ON INFANT HEARING

JOINT COMMITTEE ON INFANT HEARING (JCIH)

- Established 1969
- Most important influence on the development of national policy regarding infant hearing

http://www.jcih.org/

JCIH CONTINUED…

- Early years
  - Identification & Follow-up
- 1990
  - Expanded list of risk factors & recommendations on screening
- 1994
  - Goal should be universal detection of infants w/ HL
- 2000
  - Endorsed Early Hearing Detection & Intervention (EHDI)
- 2007
  - Current Position Statement

JCIH 2007 HIGHLIGHTS

- Separate protocols are therefore recommended for NICU and well baby nurseries.
- NICU babies >5 days are to have ABR included as part of their screen so that neural HL will not be missed
- Screening results should be conveyed immediately to families so they understand the outcome and the importance of follow-up when indicated.
- For rescreening, a complete evaluation of both ears is recommended, even if only 1 ear failed the initial screen

JCIH 2007 HIGHLIGHTS

- Re-admissions
  - For readmissions of infants in the first month of life, if there are conditions present which are associated with potential hearing loss a repeat hearing screening is recommended prior to discharge.

JCIH 2007 HIGHLIGHTS

- Diagnostic Audiology Evaluation
  - Audiologists with skills and expertise in evaluating infants with hearing loss should provide audiology diagnostic and habilitation services.
  - At least one ABR is recommended as part of a complete diagnostic audiology evaluation for children under 3 years of age for confirmation of permanent HL, in conjunction with other measures for validation of HL.

JCIH 2007 HIGHLIGHTS

- Diagnostic Audiology Evaluation Continued…
  - Infants with a risk factor for HL should have at least one diagnostic audiology assessment by 30 m of age. Infants with risk factors associated with late onset or progressive loss (eg CMV or ECMO) are followed more frequently.
  - For families who elect amplification, infants diagnosed with permanent hearing loss should be fitted with amplification within one month of diagnosis

JCIH 2007 HIGHLIGHTS

- Medical Evaluation
  - All families should be offered a Genetics consultation.
  - Every infant with a confirmed HL should have at least one exam by an ophthalmologist experienced in evaluating infants. Other specialty consultations may be indicated.

RISK FACTORS FOR HEARING LOSS

- Caregiver concerns*
  - about hearing, speech, language, development
- Family history*
  - of permanent childhood hearing loss
- NICU stay > 5 days or any of following (regardless of length of stay):
  - ECMO assisted ventilation*
  - Ototoxic medications (gentimycin, tobramycin)
  - Loop diuretics (furosemide, Lasix)
  - Hyperbilirubinemia requiring exchange transfusion
- In Utero infections
  - CMV*, herpes, rubella, syphilis, toxoplasmosis
- Craniofacial anomalies
- Physical findings (e.g. white forelock)
- Syndromes* involving hearing loss
  - Neurofibromatosis, osteopetrosis, Usher, Waardenburg, Alport, Pendred, Jervell & Lange-Nielson

JCIH, 2007

* = greater risk for delayed onset HL

RISK FACTORS FOR HEARING LOSS

- Neurodegenerative disorders
  - Hunter syndrome
  - Sensory motor neuropathies (Frieidrich ataxia, Charcot-Marie-Tooth)
- Culture positive postnatal infections associated with HL*
  - Herpes, varicella, meningitis
- Head trauma (basal skull, temporal bone)*
- Chemotherapy*

JCIH, 2007

* = greater risk for delayed onset HL

JCIH 2007 HIGHLIGHTS

- Early Intervention
  - Families of infants with all degrees of HL should be offered Early Intervention
  - The recognized point of entry for EI for infants with a confirmed HL should be linked to EHDI, and be provided by professionals with expertise in HL, including educators of the deaf and speech language professionals
  - Both home-based and center-based options should be offered as appropriate interventions

EHDI GOALS

EHDI GOALS

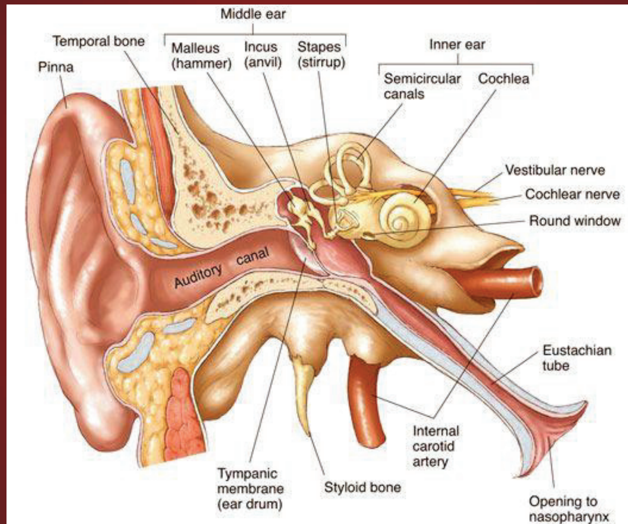
- 1-3-6
  - Screen hearing by 1 month of age
  - Diagnosis hearing loss by 3 months of age
  - Intervention by 6 months of age

MYTH #1

- On the job training for UNHS is sufficient

TESTING BASICS

- Automated Auditory Brainstem Response Test (AABR)
  - Measures the auditory nerve's response to sound



MYTH #2

- A screening refer/fail is bad

CONSEQUENCES OF A DELAYED DIAGNOSIS

- Hearing loss = an invisible acoustic filter that distorts, smears, or eliminates incoming sounds.

CONSEQUENCES OF A DELAYED DIAGNOSIS

- Impact on verbal language acquisition.
  - We speak because we hear and we speak what we hear.
- Destructive impact on the higher level linguistic skills of reading and writing.

TIPS FOR NEWBORN HEARING SCREENING

- Quiet Place to Screen
- Inspection the Ear
- Relaxed, sleeping baby
- Well-fed Baby
- Comfortable and Swaddled

MYTH #3

- A refer/fail happens because there is debris in the ear canal and it will clear up on it's own.

REASONS FOR REFERS

- Baby screened too early
- Debris in ear canal or fluid in middle ear
- High Impedance
- Myogenic Noise
- Electrical Noise
- Baby may have hearing loss

COMMUNICATION WITH PARENTS

- Must be careful on how results of the screenings are relayed to parents.
- Laugen (2013) found the screening experience was important to parents of babies that were diagnosed with hearing loss.

Laugen, N.J. (2013). Providing information to families in newborn hearing screening follow-up: Professional Challenges. *Seminars in Hearing, 34*(1), 11-18.

FOLLOW-UP AFTER UNHS

- Diagnosing Hearing Loss
  - Refer to EI for ANY type of hearing loss
    - Including conductive hearing loss

RESOURCES

RESOURCES FOR TRAINING

- National Center for Hearing Assessment and Management (NCHAM)
  - **Interactive Web Based Newborn Hearing Screening Training Curriculum**
    - **http://www.infanthearing.org/nhstc/index.html**

ADDITIONAL RESOURCES

- Frequently Asked Questions
  - http://www.infanthearing.org/infant_screening_course/nhstc_faqs.pdf
- Script for telling parents you are going to screen their babies hearing
  - http://www.infanthearing.org/infant_screening_course/whattosay-script.pdf
- Script for if parents refuse the screening
  - http://www.infanthearing.org/infant_screening_course/whattosay-refuse-script.pdf

Frequently Asked Questions Parent's May Ask (English and Spanish)

Why screen my baby's hearing?

Hearing loss is one of the most common conditions present at birth. It is easy to miss hearing loss because you usually can't see anything different. Without screening, hearing loss is often not detected until the baby is 2 years old and not talking. Early identification and intervention means that your baby won't fall behind other children in speech and language development.

¿Por qué hacerle una prueba auditiva a mi hijo?

La pérdida auditiva es una de las condiciones más comunes que se presentan en los recién nacidos. Es fácil no percatarse de su existencia porque uno no puede ver nada diferente en el bebé. Sin la prueba auditiva, es frecuente que la pérdida auditiva no se detecte hasta que el niño tiene 2 años y no habla. La identificación e intervención temprana hacen que su bebé no tenga un retrazo en su habla y desarrollo del lenguaje.

How do you check my baby's hearing?

OAE: Soft sounds are made into the baby's ear. If the ear is working normally, it will send back sounds that the computer can pick up and analyze. Your baby doesn't have to do anything other than be quiet.

ABR: Soft sounds are made into the baby's ear and electrodes or little sensors pick up the brain's response to the sounds.

¿Cómo le hace la prueba auditiva a mi hijo?

OAE: Por medio de una sonda se introducen sonidos suaves en el oído del bebé. Si el oído funciona normalmente, éste producirá sonidos que son detectados y analizados por la computadora. Su bebé no tiene que hacer nada solamente permanecer callado.

ABR: Por medio de una sonda se introducen sonidos suaves en el oído de su bebé. Electrodos localizados en la frente y en los lóbulos de las orejas detectan la respuesta del cerebro a estos sonidos.

What does Pass or Refer mean?

Pass means that your baby's ears are working normally today. However, some babies develop hearing loss later so if you are concerned, you should always talk to your baby's medical provider about getting a hearing test.

Refer means that your baby did not pass the hearing screening and needs additional testing.

¿Qué significa cuando mi bebé pasa/no pasa la prueba?

Si su bebé pasa la prueba, esto significa que los oídos de su bebé funcionan bien. Sin embargo, algunos bebés pueden desarrollar una pérdida auditiva después de la primera prueba. Si usted está preocupado debe hablar con la persona que provee los servicios de salud a su hijo sobre la posibilidad de hacerle otra prueba auditiva. Si su bebé no pasa la prueba esto significa que necesita exámenes adicionales.

What happens if my baby Refers?

If your baby refers a second time, it is very important that you make an appointment with a pediatric audiologist as soon as possible to have a complete hearing test called an Auditory Brainstem Response test or an ABR.

¿Qué pasa si mi bebé no pasa la prueba auditiva por segunda vez?

Si su bebé no pasa la prueba por segunda vez, es importante que haga una cita con un audiólogo pediatra lo más pronto posible para que realicen un examen que se llama ABR (por sus siglas en ingles).

How long does the hearing screen take?

Usually it takes 10 to 15 minutes depending on how quiet your baby is during the screening.

¿Cuánto tiempo toma hacer el examen?

Usualmente de 10 a 15 minutos dependiendo de que tan callado esté el niño durante la prueba.

Will hearing screening hurt my baby?

No. Most babies sleep through the screen.

¿Le dolerá a mi bebé?

No. La mayoría de los bebés duermen durante la prueba.

Where is the hearing screening done?

Your baby's hearing can be screened at this hospital, as part of the newborn hearing screening program.

¿Dónde se realiza la prueba?

La prueba auditiva se puede realizar en este hospital, como parte del programa de pruebas auditivas de recién nacidos.

What can be done if hearing loss is detected?

Hearing loss cannot be determined by screening. Screening tells us if further testing by a pediatric audiologist is needed. If an audiologist finds that your baby has a hearing loss he or she will talk with you about what happens next.

¿Cuál es el siguiente paso si se sospecha la existencia de una pérdida auditiva?

Una pérdida auditiva no puede ser confirmada por la prueba auditiva, esta indica que un audiólogo pediatra necesita realizar más pruebas. Si un audiólogo diagnostica una pérdida auditiva, él o ella le dirán cual es el siguiente paso a seguir.

What if I choose not to allow the hearing screen?

You will be asked to sign a refusal form and your baby's doctor will be advised of your decision. We recommend that you think about the screening. Please ask questions about your concerns. Finding a hearing loss as early as possible is critical in order for children to develop normal speech and language.

¿Qué pasa si tomo la decisión de no permitir que se le haga a mi bebé la prueba auditiva?

Se le pedirá que firme un documento y se le comunicará al doctor de su bebé su decisión. Le recomendamos que piense su decisión. Por favor haga preguntas sobre sus preocupaciones. El diagnóstico de una pérdida auditiva los más temprano posibles es importante para que los niños desarrollen un habla y lenguaje normal.

ADDITIONAL RESOURCES

- Scripts for communicating results to the parents
  - Pass Result
    - http://www.infanthearing.org/infant_screening_course/passing-script.pdf
  - Pass Result-High Risk for Hearing Loss
    - http://www.infanthearing.org/infant_screening_course/passing-script-highrisk.pdf
  - Refer Result
    - http://www.infanthearing.org/infant_screening_course/not-passing-script.pdf
  - Refer Result-High Risk for Hearing Loss
    - http://www.infanthearing.org/infant_screening_course/not-passing-script-highrisk.pdf

Communicating with Parents and Medical Providers

Not Passing Script for Babies

"Congratulations on the birth of your baby. We just finished screening your baby's hearing. Your baby did not pass the screen today. This does not necessarily mean that your baby has a permanent hearing loss, but without additional testing we can't be sure. The screening results will be provided to your baby's doctor. Please be sure you make or keep (depending on your hospital's protocol) the appointment for further hearing testing. "

Felicitaciones por el nacimiento de su bebé. Los resultados del tamizaje auditivo que le hicimos hoy a su bebé indican que él/ella no lo pasó. Esto no necesariamente significa que su bebé tenga una pérdida auditiva permanente, pero sin hacer pruebas adicionales no podemos estar seguros. Los resultados del tamizaje le serán enviados al médico de su bebé. Asegúrese de hacer una cita para hacer más exámenes auditivos o acudir a esta (dependiendo del protocolo de su hospital)."

RESEARCH

RESEARCH

- Gehring, C.E. & **Jones, A. L.** (2017). Information Given to Parents of Neonatal-Intensive Care Unit Graduates on Hearing. *Journal of Early Hearing Detection and Intervention, 2*(1), 29-39.

Survey Question	Percentage
Child had a NBHS prior to hospital discharge	98.6%
Child Passed NBHS	91.9%
Child spent 5 or more days in the NICU	91.7%
Child spent less than 5 days in the NICU and had at least one other risk factor for hearing loss	8.3%
Was not told to monitor their child's hearing upon NICU discharge	79.5%
Was not told they would receive a letter regarding follow-up on their child's hearing**	84.2%
Was not told by professionals that their child had positive risk factors for hearing loss	74.5%

RESEARCH

- Roberts, C. & **Jones, A.L.** (2017). Measuring nurses' knowledge and understanding of universal newborn hearing screenings. *Journal of Early Hearing Detection and Intervention,* 2(2), 38-47.

INTRODUCTION

- The present study was conducted to investigate the effectiveness of Universal Newborn Hearing Screening (UNHS) training provided to nursing professionals.
- Participants completed both objective and subjective measurements to evaluate their current knowledge of training procedures.

METHODS

- The UNHS training program through the National Center for Hearing Assessment and Management (NCHAM) was used to train the nurses.
  - http://www.infanthearing.org/nhstc/index.html

RESULTS

- Mean pre-test scores were 81 (SD=6) and mean post-test scores were 92 (SD=6).
  - Significant differences between pre- and post-test scores were found within participants (F [1, 14] = 33.27, $p < 0.01$).
- Significant differences between pre- and post-test surveys were found within participants for questions 1-2, 4-5, 7-8, 10, 12-14.

SURVEY QUESTIONS

- 1. How comfortable do you feel performing UNHS evaluations?
- 2. How effective do you believe your training concerning UNHS has been?
- 4. Do you feel your training has prepared you to complete UNHS using the most up to date methods?
- 5. If you have a question concerning UNHS testing methods, how comfortable do you feel asking another professional?

SURVEY QUESTIONS

- 7. Do you feel your training has prepared you to complete UNHS using the most up to date equipment?
- 8. If you have trouble with the testing equipment, how comfortable are you performing troubleshooting?
- 10. If the patient you are testing has a failing result, how comfortable do you feel documenting the result?
- 12. How comfortable do you feel interpreting the results of UNHS?

SURVEY QUESTIONS

- 13. How comfortable do you feel relaying the results of UNHS to another professional?
- 14. How comfortable do you feel counseling parents on the results of UNHS?

RESEARCH CONCLUSIONS

- In general, the findings of this study suggest that nursing professionals do not feel they are adequately up-to-date concerning administering and interpreting UNHS testing.
- Study participants who completed this specific online training made improvements in their pre- and post-testing across both objective and subjective measures.
- This indicates that the present training model is an effective way to update professionals' current knowledge while expanding their overall understanding.

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