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

<table>
<thead>
<tr>
<th>Congenital Condition Type</th>
<th>Number per 10,000</th>
</tr>
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<tbody>
<tr>
<td>Hearing loss</td>
<td>30</td>
</tr>
<tr>
<td>Cleft lip or palate</td>
<td>15</td>
</tr>
<tr>
<td>Down syndrome</td>
<td>10</td>
</tr>
<tr>
<td>Limb defects</td>
<td>8</td>
</tr>
<tr>
<td>Spina bifida</td>
<td>5</td>
</tr>
<tr>
<td>Sickle cell anemia</td>
<td>2</td>
</tr>
<tr>
<td>PKU</td>
<td>1</td>
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</tbody>
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http://www.infanthearing.org

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 (gentamycin, 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

• Neurodegenerative disorders
  
  – Hunter syndrome
  
  – Sensory motor neuropathies
    (Friedrich ataxia, Charcot-Marie-Tooth)

• Culture positive postnatal infections associated with HL*
  
  – Herpes, varicella, meningitis

• Head trauma (basal skull, temporal bone)*

• Chemotherapy*

* = greater risk for delayed onset HL

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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

• 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
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.

MYTH #2

• A screening refer/fail is bad
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 its 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.

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

ADDITIONAL RESOURCES

• Frequently Asked Questions
• Script for telling parents you are going to screen their babies hearing
• Script for if parents refuse the screening
ADDITIONAL RESOURCES

- Scripts for communicating results to the parents
  - Pass Result
  - Pass Result-High Risk for Hearing Loss
  - Refer Result
  - Refer Result-High Risk for Hearing Loss

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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 screening 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 an 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/má era no lo pase. 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 audífonos o audir a esta (dependiendo del protocolo de su hospital)."
RESEARCH


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


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.


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?

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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