

#### The Newborn Hearing Screening Training Curriculum

## Exciting Updates to the NHSTC

Randi Winston-Gerson, AuD, FAAA The National Center for Hearing Assessment and Management at Utah State University (NCHAM)





#### **Special Thanks**

To Will Christiansen, NCHAM webmaster, for his dedication and continued work in developing a variety of formats to facilitate online learning, creating a data collection mechanism and addressing ongoing technical assistance needs





#### **Special Thanks**

Tyson Barrett @ USU for assisting with the data analysis

Melissa Tumblin, Executive Director of the Ear Community for assisting with the parent script on Atresia/Microtia





### Learning Objectives

- Demonstrate how the NHSTC has benefited hospital screeners
- Describe recent and upcoming changes to the NHSTC
- Discuss how the NHSTC is being used as a quality improvement tool in EHDI programs





# NHSTC Objective

To improve the standard of care to babies and families for screening and follow-up, through efficient practices resulting from quality, comprehensive, standardized training





#### Benefits to Screeners

- Defines and reinforces NHS as a comprehensive program, comprised of many critical components
- Instills knowledge which is powerful for self confidence



# Benefits of State EHDIs Institutionalizing the NHSTC for Screener Training

- Provide a consistent training solution for hospital and out-of -hospital screeners
  - Quality Assurance
  - Competency based training tools
  - Consistency in knowledge for all screeners
- Standardizes training procedures
  - Unconventional methods can lack standardization and continuity
  - Information gets lost in transition between trainers
  - Dilution of training quality over time
- Provides a mechanism for documentation of competencies





#### NHSTC 12 year evolution





#### About the Process

Developed outline



- Presented at EHDI 2006 Conference
  - Gathered feedback from attendees
- Pulled together team
- Conducted many weekly meetings, held face to face meetings whenever possible
- Sent out preliminary version for review
- Conducted pilot project with 8 states

#### The Pilot Project

DVDs and evaluation forms sent to 10 EHDI

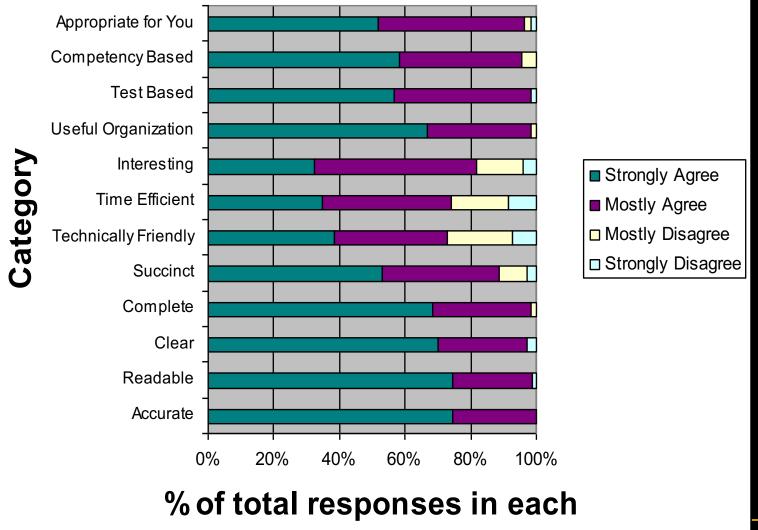
- State Coordinators
  - Each disseminated to 2 3 hospitals
  - Received 73 evaluations
    - I8 hospitals

experienced and new screeners

- program coordinators
- EHDI Coordinators
- audiologists



#### **Summary Review of Training**



category

### Newborn Hearing Screening Training Module

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### Rationale for Developing Materials

- Large number of screeners nationally
- High turnover in staff
- Limited Resources (state and local)
- Current training procedures lack standardization
  - Information gets lost in transition between trainers
  - Dilution of training quality over time
- Hospital need for
  - Quality Assurance
  - Competency based training tools

#### **Final Product**

- Power Point format
  - Easily incorporated into a hospital's intranet
  - Allows individual programs flexibility
- Video clips to enhance dialogue
- Linkages to equipment sites
- Competency tests
- Competency checklists

### **8 Sections**

- I. Introduction to Newborn Hearing Screening
- 2. About Ears and Hearing
- 3. Getting Ready to Screen
- 4. Screening with OAE
- 5. Screening with ABR
- 6. Communicating with Parents and the Medical Home
- 7. Completing the Screening Process
- 8. Screening Babies with Risk Indicators

# Introduction to Universal Newborn Hearing Screening

#### **Section 1**

Learning Objectives

#### The screener will learn:

- The definition of screening
  - The impact of screening
- About the early hearing detection and intervention (EHDI) process

# What is a Screening?

Screening is the first step in finding the babies that need additional testing to identify a hearing loss



# Impact of Screening

- Critical period for developing speech and language is between birth and three years
- Without newborn hearing screening, hearing loss is detected late, resulting in delayed speech and language development

# 1-3-6 National EHDI Goals

- 1 Screen for hearing loss before one month of age
- 3 Diagnose hearing loss before three months of age
- 6 Enroll in early intervention programs before six months of age

### Section 1 - Test

- 5. In order to reach the EHDI National Goals, all babies must be screened by:
  - a) 1 month of age
  - b) 3 months of age
  - c) 6 months of age
  - d) None of the above

### **Parent Notification**

- Inform parents about the newborn hearing screening procedure
- Refer to your
   hospital guidelines
   regarding
   procedures



# Preparing Baby for Screening

- Optimal state for screening babies
  - Sleeping
  - Quiet
  - Well fed
  - Comfortable
- Swaddled
- Sucking on a pacifier



# Learning Objectives

- The screener will learn:
- About OAEs
- How to screen accurately and efficiently with OAEs
- How to troubleshoot
- Special considerations for screening babies with OAEs

### **Position of the Screener**





#### **Good Position**

**Bad Position** 

#### Placing the Probe in the Baby's Ear



# **Special Considerations**

- NICU babies
- Screening babies re-admitted after discharge
- Follow-up testing



# Learning Objectives

#### The screener will learn:

- About Auditory Brainstem Response (ABR)
- How to screen accurately and efficiently with automated ABR
- How to troubleshoot
- Special considerations for screening babies with automated ABR

# **ABR Screening Steps**

- Baby should be sleeping or very quiet
- Environment should be quiet
- Inspect the ear
- Carefully place electrodes
- Ensure good impedance
- Properly place the earphone or probe

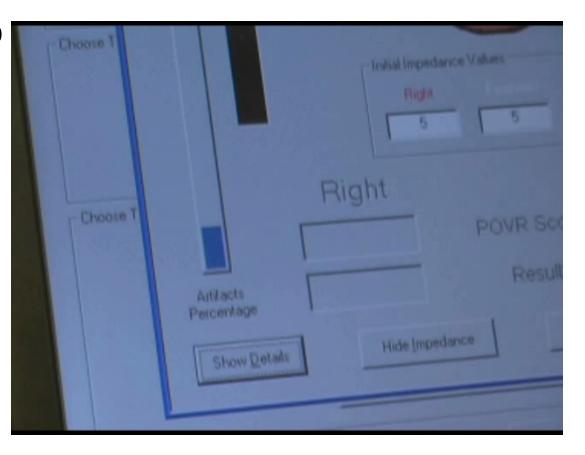
# **Improving Impedance**

- Electrode placement on a scrubbed area
- Issues with electrodes sticking
- Apply electrode paste under electrode to reduce impedances



# Important Considerations to Reduce Myogenic Noise

- Baby fed prior to testing
- Baby swaddled and comfortable
- Use neck roll
- Baby sleeping
- If sucking, remove pacifier



# **Troubleshooting Automated ABR**

- Make sure baby is in a quiet state
- Remove pacifier if baby is vigorously sucking
- Make sure that the environment is quiet
- Check placement and seal of earphones
- Check probe fit
- Ensure proper placement of electrodes
- Check cable and cord connection
- Check electrical noise

# **Do NOT Screen Repeatedly**

- Remember your goal is NOT to pass every baby
- A baby with a hearing loss may falsely pass with multiple screenings
- Screening repeatedly is not cost effective or an efficient use of time

# Communicating with Parents and the Medical Home

#### **Section 5**

# Language and Culture

- Be sensitive to cultural differences when communicating with families
- Use an interpreter to communicate with non or limited English speaking parents

### A Not Passing Result

- Simply and clearly convey results verbally
- Provide written communication regarding test results
  - Report
  - Letters
  - Brochures



# Completing the Screening Process

The hearing screen is considered incomplete if the entire screening process is not completed prior to discharge



# **Missed Babies**

# Babies that are discharged before screening is conducted or completed

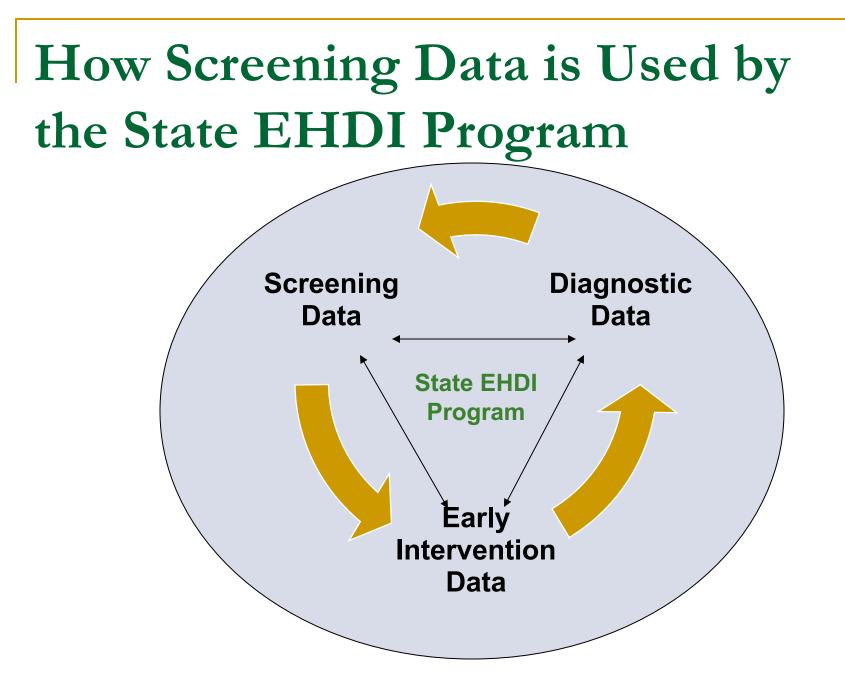




# Good Record Keeping = Good Data

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Action: Need Outpatient Appt. Status: In Progress	Medical ID: 2		Birth-Date:			1	-	•
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Documentation is the printed, written and electronic record of each baby's screen and is part of that baby's medical record



# **Reducing Loss to Follow Up**

- Use an interpreter when needed
- Provide written materials in parent's language
- Ensure an appointment for follow-up is made prior to discharge including:
  - Where they need to go for follow-up screening
  - Scheduling an outpatient screen within two weeks of discharge
- Verify contact information and obtain an alternate contact name and phone number
- Verify the Primary Care Provider (PCP) and communicate results to him or her

# **Communication to Providers**

- Ensure providers are immediately informed
  - Faxing
  - Letters
  - Phoning



# What is a Risk Indicator?

There are certain factors (indicators) that place children at risk for hearing loss that are either present at birth (congenital) or may develop in infancy, or later in childhood (late onset or progressive).



# What are the JCIH 2007 Risk Indicators?

- Parent concern
- Family history of permanent childhood hearing loss

For more information, visit http://www.jcih.org

# What are the Risk Indicators?

- If an infant has needed:
- Neonatal intensive care for more than 5 days
- Assisted ventilation for 10 days or more
- Ototoxic meds for 7 days or more
  - E.g: Gentamycin, Tobramycin, or loop diuretics (furosemide, Lasix)

# Outpatient Screening: Rescreening

# **Section 8**

# Learning Objectives

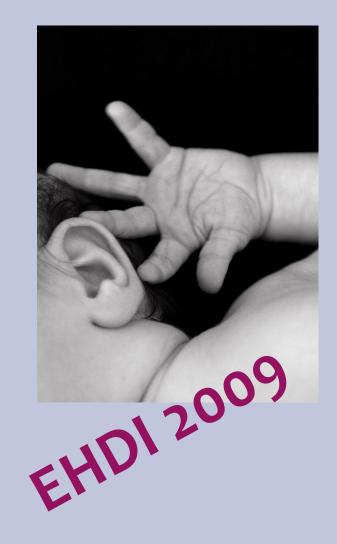
# The screener will learn about:

- The critical timeframe for rescreening
- Outpatient screening methods
- Communication
- Documentation

# **Re-screen Before One Month of Age**

# **NHSTC Status**

- First release July 2008
- Sold out first cut: shipped over 1450 copies
  - All State EHDI Coordinators, AAP Chapter Champions
  - State orders: AZ, AR, CA, CO, GA, HI, IN, IL, KS, KY, MN, NB, ND, NJ, NH, PA, RI, UT, WA.
  - Ireland, Canada
- Recently Updated: 12-08
  - Fixed known technical glitches, Added scripts for high risk babies, added pictures
- 2000 more copies produced



# What Does the NHSTC Consist of?

- 1 Introduction to Newborn Hearing Screening
- 2 Getting Ready to Screen
- 3 Screening with Otoacoustic Emissions
- 4 Screening with Automated Auditory Brainstem Response
- 5 Communicating with Parents and the Medical Providers
- 6 Completing the Screening Process
- 7 Screening Babies with Risk Indicators
- 8 Outpatient Screening/Re-screening



# **Resources Disc**

#### For Screeners

- · Scripts for communicating with parents in both English and Spanish
- Frequently Asked Questions
- · Links to related websites
- Glossary

#### For Program Managers

- Competency checklists
- · Test questions and answers
- JCIH 2007 Position Statement and Program Checklist

# Solution is a 2-Disk Set

#### All the critical information for quality newborn hearing screening.

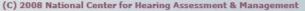
The Curriculum Disc will play on a standard movie DVD player or on a computer with DVD movie player software.

- Insert the DVD into the player and choose the section from the menu that you want to view.
- After choosing a section you can:
  - Play Automatically
  - Play Manually (pause after each slide)
  - Thumbnails (preview each slide)
- For Manual Play and Thumbnails, use the "Next Chapter" button on your remote to advance to the next slide.
- Use the pause button on your player to pause the playback at any time.

The Resources Disc is a computer data disc. It can be used with either a Windows or Macintosh computer. The files on the disc are in Microsoft Word (.DOC) and Adobe Acrobat (.PDF) format. You may need to install the Adobe Acrobat Reader program in order to view the Acrobat PDF files.



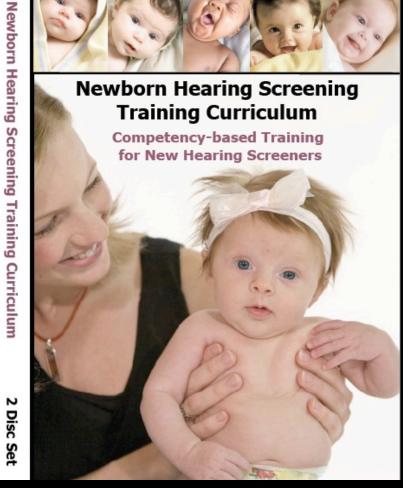




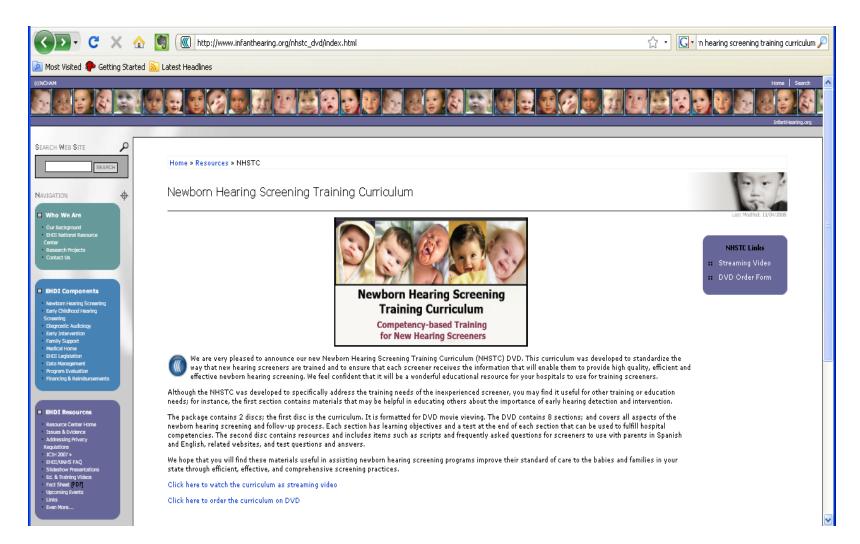


#### Newborn Hearing Screening Training Curriculum

**Competency-based Training** for New Hearing Screeners



# Streaming Video on infanthearing.org



# Illinois EHDI Pilot Study pl 2011

- Purpose
  - To investigate learning, screening and follow-up outcomes from the NHSTC

Background

- Primary Goal of the study
  - To increase screener knowledge and confidence in all aspects of the NHS process
- Aim of the study
  - To increase the number of parents connected to the next step if baby fails the screening
  - To improve hospital NHS program outcomes



# Illinois EHDI Pilot Study

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# Instruments

- Prior to the training screeners completed
  - Screener Information Questionaire
  - Pre-test
- Following the training the screeners completed
  - Post Training Questionaire
  - Post-test
- Parent Survey
- Hospital Screening Statistics Form





# NHSTC Web

(Funded by IL EHDI and NCHAM)

- Web format, accessible through the NCHAM Website....
- Designed to be a "One Stop Training Shop" for hospital screening programs
  - Screener training (based on initial product)
  - Hands on demonstration videos
  - Adult learning tools
  - Added Resources, a link to state specific information





# NHSTC Web

- Babies with Risk Indicators updated
- Parent Scripts Role Modeling
- Parent Videos
- Pre-tests
- Updated photos of different intervention options







#### NEWBORN HEARING SCREENING

#### TRAINING CURRICULUM

## MAIN MENU

Introduction to Screening

Module 2

Module 1

**Preparing to Screen** 

Module 3

Screening with OAE/A-ABR

Screening with OAE Screening with A-ABR

Module 4

**Communicating with Parents & Providers** 

Module 5

**Completing the Screening Process** 

#### Module 6

Screening Babies with Risk Indicators

#### Module 7

**Outpatient Screening & Re-screening** 



Splash Page

Use the drop down to go to a page.



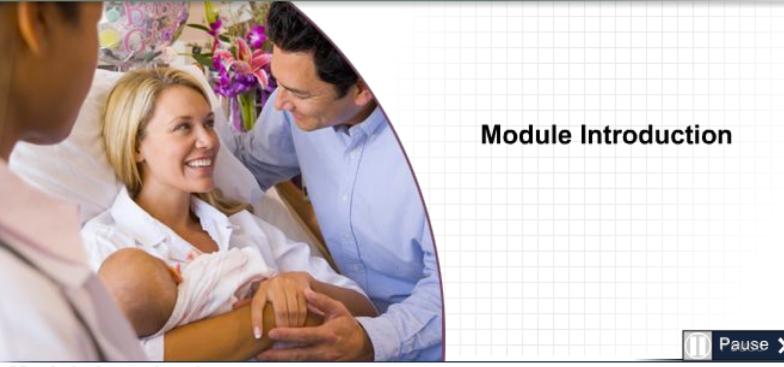




#### NEWBORN HEARING SCREENING

#### TRAINING CURRICULUM

#### Introduction to Newborn Hearing Screening



#### **Module Introduction**

In this module we'll discuss the definition of screening, the impact of screening and about the early hearing detection and intervention or EHDI, process. To better demonstrate the importance of training let's listen in on pediatric audiologist Beth. She's just started to train Jordan on how to

Main Menu



#### Page 1 of 6

Back

Next



# Overview of Webpage and Other Features

# www.infanthearing.org

- HTML Course
  - Simple viewing
  - No registration
  - No tracking of outcomes
  - No certificate or CEUs





# **Overview of Webpage and Other Features**

## Moodle course

- An elearning management system
- Registration required
- Allows for competency based learning and tracking of outcomes
  - pre and post tests
  - pre and post self assessment survey
  - CEUs (AAA and NAP NAP)
  - NCHAM Certificate of Completion





# Certificate of Completion and CEUs

- NCHAM Certificate of Completion upon obtaining a score of 80% or better on the Moodle course postest
- -.2 CEU Credits
  - American Academy of Audiology (AAA)
  - National Association of Pediatric Nurse Practioners (NAPNAP)



Data Analysis 2015 N=1,200 Data Analysis 2018 N=5,904

Measures:

- 1. Did participants show an improvement in pre-test versus post-test knowledge?
- 2. Did participants feel increased confidence as a result of taking the NHSTC?
- 3. What is the frequency of use by state?



# **Covariates for Consideration**

- 1. What job position do they hold?
- 2. Did their scores vary based on discipline?



# Data Analysis Measures

- Self Assessment Pre-Training
- Self Assessment Post-Training
- NHSTC Pretest
- NHSTC Postest



# Measures 1 Self- Assessment Pre-training Tool

Rate the extent to which you agree or disagree with the statements using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Not sure 4 = Agree 5 = Strongly Agree

I am confident in my ability to:

- Educate parents about the importance of newborn hearing screening
- Conduct an OAE screening
- Perform OAE troubleshooting
- Conduct an A-ABR screening
- Conduct A-ABR troubleshooting
- Conduct screening on NICU Babies and babies with risk factors
- Tell parents the results when the baby passes the screening
- Tell the parents the results when the baby fails the screening
- Connect parents to outpatient testing when needed

NCHAM National Center for Hearing Assessment and Management Utah State University<sup>™</sup>



## Self- Assessment Post-Training Tool

Rate the extent to which you agree or disagree with the statements using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Not sure 4 = Agree 5 = Strongly Agree

This training section provided me with useful information that increased my confidence in the following areas of newborn hearing screening:

- The Benefits of Newborn Hearing Screening
- Getting Ready to Screen
- Screening with Otoacoustic Emissions (OAEs)
- Screening with Automated Auditory Brainstem Response (A-ABR)
- Communicating with Parents and the Medical Providers
- Completing the Screening Process
- Screening Babies in the NICU and with Risk Indicators
- Outpatient Screening: Rescreening





#### **Distribution of NHSTC Graduates**

# From August 2015 through January 2018 **5,904 people completed the curriculum**





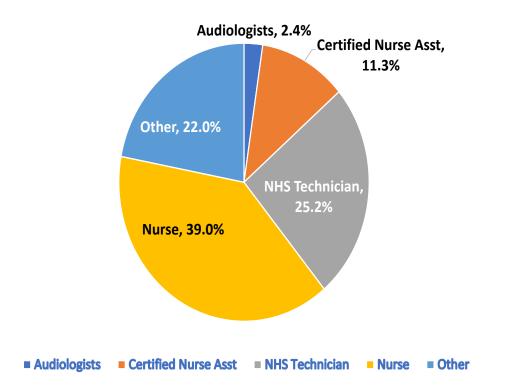
# Data Analysis 2018 – State Distribution

1	alabama	99	25 nebraska	63
2	arizona	376	26 nevada	71
3	arkansas	71	27 new hampshire	1
4	california			304
5	colorado			115
6	connecticut	7		
7	district of columbia	3	30 new york	49
8	florida	193	31 north carolina	91
9	georgia	94	32 north dakota	1
10	idaho	72	33 <u>ohio</u>	29
11	illineis		34 oklahoma	38
12	indiana		35 oregon	84
13 14	iowa	92 37	36 pennsylvania	150
15	kansas kentucky		37 rhode island	76
16	louisiana		38 south carolina	27
17	maine	42	39 south dakota	1
18	maryland	33	40 tennessee	10
19	massachusetts	41	41 texas	398
20	michigan	11		476
21	minnesota	10		
22	mississippi	37		
23	missouri	51	44 washington	17
24	montana	64	45 west virginia	4



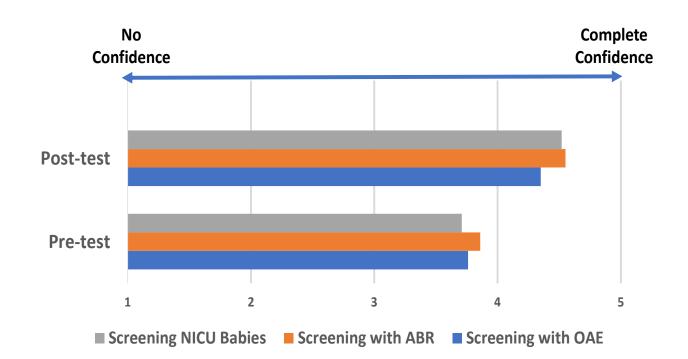


#### Participants in the Newborn Hearing Screening Training Curriculum





## Increased Confidence After Completing NHSTC







#### **Overall Pre and Post Test Comparison by Percent**

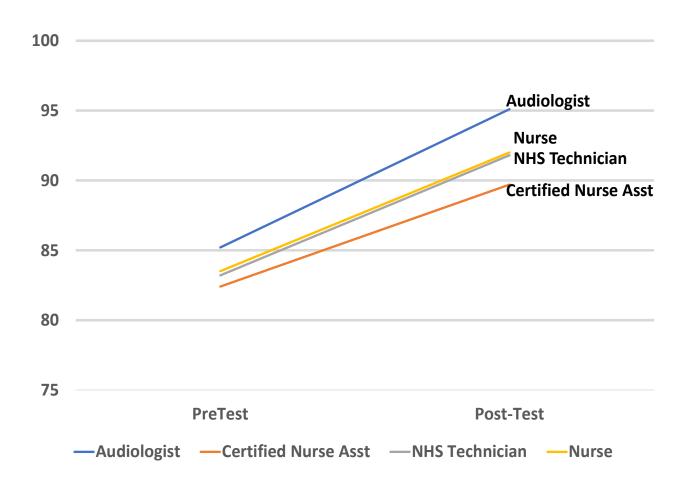
2012	MEAN	Ν
Pretest	75.9	1006
Postest	92.6	1006

2018	MEAN	Ν
Pretest	82.8	5904
Postest	91.5	5904





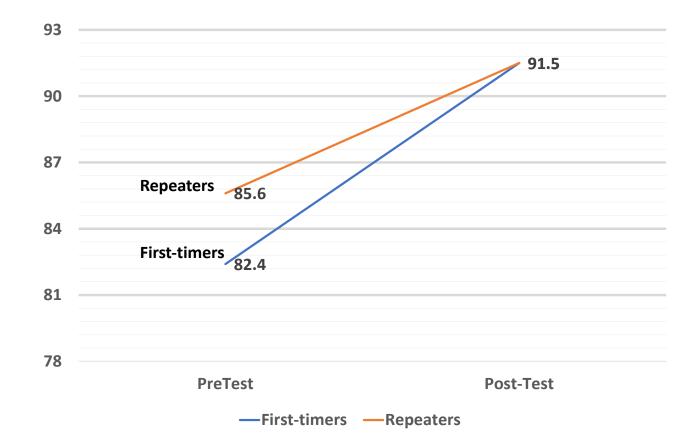
# Improvement from Pre-Test to Post-Test by Type of Screener



Utah State University™



#### Improvement for "First-timers" Compared to "Repeaters"





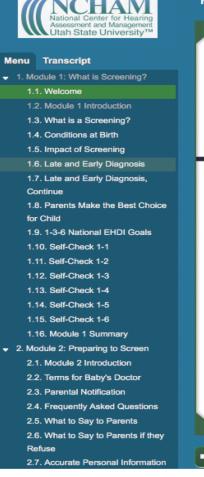
#### Statistical Analysis 2015 and 2018

Summary Confidence and Knowledge

- Overall the NHSTC increases individual confidence and knowledge
- Some people know know more about performing the screenings prior to taking the training course, and some feel more confident than others, but in general, the majority of people are fairly similar in knowledge and confidence after finishing the training.



#### NHSTC Web Version II







Jtah State Univers



#### Menu Transcript

- 7.17. Self-Check 7-5
- 7.18. Self-Check 7-6
- 7.19. Module 7 Summary
- 8. Module 8: Outpatient Re-screening
  - 8.1. Module 8 Introduction
  - 8.2. Conduct Before One Month
  - 8.3. Set up Follow-up Appointment
  - 8.4. If No Outpatient Re-Screens
  - 8.5. Preparing for Outpatient Re-Screen
  - 8.6. Outpatient Screening Methods
  - 8.7. Outpatient Results
  - 8.8. Communication to Medical Home Providers
  - 8.9. Documentation
  - 8.10. Outpatient Activity
  - 8.11. All Finished
  - 8.12. Self-Check 8-1
  - 8.13. Self-Check 8-2
  - 8.14. Self-Check 8-3
  - 8.15. Self-Check 8-4
  - 8.16. Self-Check 8-5
  - 8.17. Self-Check 8-6
  - 8.18. Module 8 Summary
  - 8.19. Resource Introduction
  - 8.20. Newborn Hearing Screening
  - Process Video
  - 8.21. Course Credits

Newborn Hearing Screening Training

#### Credits

- NHSTC Web is a collaborative project between the National Center for Hearing Assessment and Management (NCHAM), Illinois EHDI, the Maternal Child Bureau (MCHB) and the Arizona Department of Health Services Office for Children with Special Healthcare Needs
- Project Lead: Randi Winston-Gerson, AuD, CCC-A
- Project Contributors: Patricia Burk, MS, CCC-SLP, LSLS Cert. AVT, Karen Markuson Ditty, AuD, FAA,CCC-A, Colleen Green, Marlene Hesley, LPN, Jeanne Hollabaugh, MA, Michelle King, AuD,CCC-A, Stacy Jordan, MA, CCC-A, Karen Muñoz, Ed.D., Lylis Olsen, MS, MPH, CCC-A, Diane Sabo, PhD.
- Special thanks to: Ginger Mullin, AuD and the Illinois Early Hearing Detection and Intervention Program at the University of Illinois Chicago Division of Specialized Care for Children

#### Developed by: Cine Learning Productions.

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#### Project Contributors

- Patricia Burk
- Karen Ditty
- Stacy Jordan
- Michelle King
- Angie Mister





### **Updates and Changes**

- Content updates
  - Separated OAE and ABR sections
  - Complete review, overhaul and best practice updates
  - Require both ears pass during same screening session
  - No more than 2 inpatient screens in optimal conditions



# Updates and Changes Cont.

- Switched ears considerations
- Bed side screening practices
- Script for parents of babies with atresia/microtia
- Babies transferred from other hospitals
- Importance of screening in optimal conditions



## Updates and Changes Cont.

- Brand new Format
  - From Flash to Storyline
  - Ease of navigation within the course
  - Course accessibility from smartphone or ipad
  - New photos and videos
- Recertification Section
  - 40 test questions covering details from all course aspects





## Updates and Changes Cont.

New Module

- Midwife
- Out-of-hospital
- Outpatient





 New NHSTC Version (non-Moodle): <a href="http://www.infanthearing.org/nhstc-2018/NewbornHearingScreeningTraining/story\_html5.html">http://www.infanthearing.org/nhstc-2018/NewbornHearingScreeningTraining/story\_html5.html</a>

NHSTC Re-Certification Test (in Moodle):
 <u>https://ncham-</u>

moodle.eej.usu.edu/moodle/mod/quiz/view.php?id=627

 Password to Access the Test: recertification4NHSTC





### Questions?



