

Implementing OAE Hearing Screening for 0 - 3 Year-Old Children in Head Start

An audiologist's training and
technical assistance manual



Helping
Children
Hear
and
Now

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This training manual is a companion to the Instructional Guide and Training Video entitled, “Early Identification of Hearing Loss: Conducting periodic Otoacoustic Emissions (OAE) hearing screening with infants and toddlers in early childhood settings”

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The Role of Audiologists in Helping Head Start Programs Implement OAE Screening

Currently, many Head Start grantees serving children 0 - 3 years of age are seeking the assistance of audiologists to help them update their hearing screening practices through the use of Otoacoustic Emissions technology. This manual, developed specifically for audiologists, is part of an instructional package entitled ***Early Identification of Hearing Loss: Conducting periodic Otoacoustic Emissions (OAE) hearing screening with infants and toddlers in early childhood settings***. Developed by the National Center for Hearing Assessment and Management at Utah State University, the package is designed to prepare Head Start staff to appropriately implement OAE screening and follow-up practices. All elements of the training package, including this manual, are available at <http://infanthearing.org/earlychildhood/index.html>.

Background

Early Head Start (EHS) and Migrant and Seasonal Head Start programs serve children 0 - 3 years of age; some American Indian and Alaska Native programs may also serve young children in this age range. Head Start Performance Standards require that all children receive a hearing screening within the first 45 days of enrollment. Traditionally, most programs have had to rely on subjective screening methods to satisfy screening requirements; however, recent feasibility studies have demonstrated that Head Start staff can be trained to successfully update their screening practices using objective OAE screening methods. As a result, increasing numbers of children with hearing disorders have been identified, including children with sensorineural hearing loss and a range of other conditions. A concerted effort is now being made by the Office of Head Start to inform all programs about OAE screening practices.

Role of Audiologists

It is critical that early childhood programs interested in implementing OAE screening practices for children 0 – 3 years of age develop a working relationship with a pediatric audiologist who will help plan the program, provide training and technical assistance, address questions as they arise, and promptly evaluate children not passing the screening. Some audiologists also play a supervisory role in monitoring screening and follow-up activities which can significantly contribute to the long-term quality of the screening program.

Information in this manual will help audiologists collaborate successfully with Head Start programs in:

- 1) Planning an OAE screening program
- 2) Training early childhood staff in OAE screening and follow-up practices
- 3) Providing follow-up technical assistance and monitoring screening program quality

OAE Hearing Screening Implementation Checklist

Early childhood programs and collaborating audiologists will find this checklist helpful in planning and implementing an OAE screening and follow-up program.

1. Decide on the specific screening and follow-up protocol to be implemented.
2. Determine how often children will be screened as a matter of standard practice (at a minimum, annually). Decide how often children with risk factors and other concerns will be screened.
3. Get acquainted with your state's newborn hearing screening or Early Hearing Detection and Intervention (EHDI) Program which has valuable information that can help with your screening program activities.
4. Select and purchase OAE equipment demonstrated to work effectively for screening children 0-3 years of age. Current cost of OAE equipment is approximately \$3400- \$4000. Also purchase disposable probe tips.
5. Identify which early childhood program staff will perform the OAE screening, and when and where the screening will be conducted.
6. Train all individuals responsible for screening and follow-up up using the *Early Identification of Hearing Loss* training video (available in the instructional package on CD-ROM or on the website listed below). The training should be supervised by an audiologist and include a review of the protocol and hands-on practice screening children.
7. Designate where the OAE equipment will be stored and who will be responsible for equipment care, maintenance, ordering supplies, coordinating use of equipment, etc.
8. Review the OAE Hearing Screening Form (see appendix) and determine whether adaptations are necessary.
9. Determine what documentation of screening results will be provided to parents, health care providers and audiologists when children refer from screening and need further evaluation.
10. Establish a two-way referral system whereby information on children not passing the screening is transmitted from the early childhood program to health care providers AND where subsequent diagnoses and treatment results are obtained. Early childhood program staff will need to rescreen children after medical clearance and facilitate referral to an audiologist or other specialist as needed.
11. Determine how each individual child's screening results, and any subsequent diagnostic or treatment information, can be thoroughly documented in the early childhood program's tracking system.
12. Monitor pass/refer rates, adherence with protocol and timelines, and follow-up on referrals. Access technical assistance and support from the audiologist when needed.
13. Provide teachers with information on how they can support children identified with hearing loss.
14. Report to your state EHDI Program any child identified with a permanent hearing loss. Your EHDI program may have additional resources to help your program and/or the child's family.

Additional resources corresponding with this checklist can be found at <http://infanthearing.org/earlychildhood/resources.html>.

Getting Acquainted with Head Start

This manual focuses on helping Head Start update hearing screening practices used with children 0 - 3 years of age. Children in this age range may be served through:

- Early Head Start
- Migrant/Seasonal Head Start
- American Indian/Alaska Native Head Start

All Early Head Start and Migrant Head Start programs serve children 0 - 3 whereas only some American Indian/Alaska Native Head Start programs serve this younger population. Programs will also vary with respect to the types of services offered. Some will provide center-based services, some will provide home-based services and some will offer both. Regardless of the setting in which services are offered, Head Start Performance Standards require that all children receive a hearing screening within the first 45 days of enrollment. The Performance Standard does not specify a method or mechanism for accomplishing hearing screening; instead, every Head Start program has a Health Services Advisory Committee which provides guidance on how hearing screening will be conducted. As a result, hearing screening practices may vary considerably from one Head Start program to the next.

Traditionally, Head Start programs serving children 0 - 3 years of age have used subjective hearing screening methods such as hand clapping, bell ringing, parent questionnaires, or notes from health records as documentation of screening. Health-care records indicating that ears have been “checked” are commonly misinterpreted as a “hearing screening” outcome. In reality, most health care providers do not have access to physiologic hearing screening equipment that can screen inner ear functioning nor are they able to conduct an audiologic evaluation. OAE technology therefore represents a significant step forward in allowing Head Start programs to reliably screen children 0 - 3 years of age for permanent hearing loss.

Resources that are a part of the Head Start system that may be helpful include:

The Head Start Regional Office. As a federal program, Head Start is divided into 12 regions. These Regions are responsible for meeting the general (non-technical) training and support needs of all programs within their regions, for overseeing programs, and for ensuring compliance with performance standards. Health and Disability Specialists can support efforts to improve hearing screening and follow-up practices with Head Start programs. Ask program staff with whom you are working who their Health and Disability Specialists are and arrange a time to jointly discuss activities you are undertaking to implement OAE hearing screening practices.

The Head Start State Collaboration Office. Each state also has a Head Start State Collaboration Office that helps establish interagency collaborations between Head Start and other programs or agencies in the state. It can be very helpful to meet with the State Collaboration office to explore ways in which sharing of information and other collaborative activities can occur within the state. Establishing a relationship with the Collaboration Office is particularly important if you are interested in creating a data-sharing mechanism between the State Early Hearing Detection and Intervention (EHDI) program and Head Start programs. The State Collaboration Office can also provide valuable information on current Head Start activities and contact information for programs within the state.

Both of these offices can play a valuable role in providing guidance to the Head Start program on securing funding for OAE equipment and initiating an OAE screening program.

The following resources will help you further acquaint yourself with the many aspects of Early, Migrant and American Indian Head Start services.

- <http://www.acf.hhs.gov/programs/hsb/>
- <http://www.ehsnrc.org/>

The following website will assist you in identifying Head Start programs in your state:

- <http://www.acf.hhs.gov/programs/hsb/hsweb/index.jsp>

Preliminary Planning

Introducing OAE Screening - OAE Screening Protocol - Equipment Selection

This section highlights basic concepts that you will want to review with the Head Start staff as they consider implementing an OAE screening program. Prior to setting up any training, take an opportunity to sit down with Head Start staff, review how OAE screening is done, discuss the protocol and equipment considerations, and talk through each item listed on the the OAE Hearing Screening Implementation checklist (provided in the introduction of this manual).

Introducing OAE Screening to Head Start Staff

A short 30-second video demonstration of OAE screening is available on the web at <http://infantheating.org/earlychildhood/resources.html>.

The procedure is performed with a portable handheld screening unit. A small probe is placed in the child's ear canal. This probe delivers a low-volume sound stimulus into the ear. The cochlea (inner ear) responds by producing an otoacoustic emission (OAE), sometimes described as an echo, that travels back through the middle ear to the ear canal and is analyzed by the screening unit. In approximately 30 seconds, the result is displayed on the screening unit as a "pass" or a "refer".

OAE screening is the most practical method for screening infants and toddlers in early childhood settings because it:

- Does not require a behavioral response.
- Can help to detect sensorineural hearing loss and call attention to hearing disorders affecting the pathway to the inner ear
- Is quick and painless
- Can be done by anyone who is trained to use the equipment and is skill in working with children

Screening Protocol and Expected Referral Rates

In planning an OAE screening program that serves 0 - 3 year old children, it is critical that Head Start staff understand the importance of a 2-step screening and follow-up protocol and the programmatic implications of implementing such a protocol. The protocol is covered in detail during the training (and is described fully in the Head Start staff's *Instructional Guide*.) Review the *OAE Screening Form*, which reflects the screening protocol and which screeners will use to document screening results, as well as the *Follow-up Diagnostic Form* to be completed by the health care provider (forms included in the appendix). Discuss the following elements with Head Start staff:

- 1) All children must receive an initial OAE screening of both ears.
- 2) Any child who does not pass on both ears must be rescreened within 1-2 weeks. A program can estimate that approximately 25% of children screened will not pass the initial screening and will require a second OAE screening on at least one ear.
- 3) Children not passing the second screening are referred to a health-care provider. Approximately 8% of children screened will not pass either the first or second OAE screening and will be referred to a health care provider.

- 4) Once a child has received medical clearance indicating there are no observable medical conditions in the ear, the child **must receive an OAE rescreening**.
- 5) Children not passing the rescreening are then referred to a pediatric audiologist for a full diagnostic evaluation. It is anticipated that less than 1% of children will not pass the OAE rescreening after medical clearance and will require a referral to a pediatric audiologist for a complete diagnostic evaluation.

Timely rescreening and attention to follow-up on referrals is critical for implementing a successful OAE screening program. Programs will need to integrate screening results into their existing tracking system and/or use some type of screening log (see Sample Screening Log in the appendix) to monitor which children are in need of follow-up.

Equipment Selection and Obtaining Funding for Equipment Purchase

OAE screening equipment is available from a number of manufacturers; however, not all OAE equipment has been designed to be equally effective for use with 0 - 3 year olds in early childhood educational settings. Carefully review the *Elements to Consider When Purchasing OAE Equipment* (see appendix) and help Head Start staff make an informed decision on what type of equipment to purchase. Current cost of portable OAE equipment is approximately, \$3400 - \$4000. Also consider the ongoing cost of disposable probe tips (covers).

While some Head Start program may have existing funds to purchase equipment, many will need to include this as an item in future budgets. The Head Start Regional Office and the Head Start Collaboration Office may provide guidance on securing funding. In addition, here are some other ways you can help Head Start staff get started:

- 1) Equipment Loan programs: Some equipment manufacturers offer 6-month loan units to programs initiating screening activities. This allows programs to begin providing OAE hearing screening services while funds are being secured.
- 2) Donation programs: Hospitals that have been operating OAE screening programs for several years sometimes replace their OAE equipment even though the screening units are still functional. Donations or low-cost purchases of equipment from hospitals may be possible.
- 3) Eliciting fund donations for equipment: Charitable organizations often want to make contributions for tangible items like hearing screening equipment. A sample grant application for soliciting funds to purchase OAE equipment from charitable organizations is found in the appendix of this manual. It can also be downloaded, adapted and submitted to charitable organizations: <http://infanthearing.org/earlychildhood/resources.html>.

Planning the OAE Training Workshop

As you plan a training workshop, determine whether you will need to enlist a “training team” comprised of other experienced screeners (who do not necessarily need to be audiologists, but can be educators in the hearing health community, etc.) to assist you during the hands-on portion of the training workshop. Generally speaking, one experienced screener will be needed to supervise every group of approximately four learners.

Checklists for planning a training workshop and workshop materials appear in the Appendix of this manual. The following elements should be considered in planning a training workshop:

- Identify a program site to host the training workshop
- Schedule the training workshop
- Schedule and plan specific workshop activities, including breakfast and lunch.
- Confirm the availability of audio-visual and hearing screening equipment
- Prepare host site teachers and other staff
- Get acquainted with key host program procedures
- Obtain materials

Identify a program site to host the training workshop

In selecting a location for the training workshop, the most important element is that it must be conducted in a Head Start center where children of a variety of ages, 0 - 3, will be attendance and available to have their hearing screened. A central element of the training workshop is the actual “hands-on” screening practice and it is therefore important that each trainee be given the opportunity to screen no fewer than five children. While it is possible to conduct a training workshop where parents have been asked to bring children in for screenings, it is preferable to conduct trainings at center-based programs where a predictable number of children are present each day.

Note: Programs hosting a training workshop will receive the benefit of having a significant number of their children screened during the workshop. The screening outcomes on each child will be documented as a part of screening practice activities and will satisfy screening requirements. This should be emphasized to programs as a benefit to hosting the training workshop.

In addition to access to children, the selected host site also needs to be able to physically facilitate small group activities (a conference room or empty classroom with tables and chairs) so that participants can easily divide into groups during the practice screening portion of the agenda.

Select a location that:

- Is accessible to all potential participants, including individuals with disabilities.
- Has access to restrooms.
- Permits refreshments and lunch to be served on site.
- Can provide a quiet, distraction-free environment (a conference room, empty classroom, etc.) offering:

- Electrical outlets in case equipment needs to be plugged in during the demonstration and practice screening periods.
- A TV-VCR, or LCD projector and laptop computer from which the video can be played.
- Sufficient space, tables and seating (moveable) for the number of participants who will be in attendance. It is important to have an environment that is comfortable and conducive to open discussion, including seating at tables that can be arranged in a semi-circle or U-shape to allow participants to interact with one another and to view the presenters and video while also having a table on which to write. The table arrangement should also permit a place for people to cluster in groups of up to four learners to work with screening equipment.

During the screening practice portion of the training, children can remain in their classroom where a modest amount of talking and play noise is taking place. It is helpful for the classroom teacher help keep the sound level to a minimum.

Schedule and plan specific workshop activities, including breakfast and lunch

The training workshop is designed to take approximately 6 hours, including a 15-minute gathering period at the beginning during which people will have breakfast snacks and drinks and a 45-minute lunch period. It is recommended that you plan for light breakfast and lunch food to be offered at the location of the training so that the meeting is kept on schedule. Plan to have food and drinks delivered or available at least 15 minutes prior to the scheduled time in case you are ahead of schedule.

Be sure to check the children’s schedule at the host site so that children will be available to be screened when needed and so that screening does not interfere with their snack and lunch schedules.

Obtain hearing screening equipment

Sufficient OAE screening equipment is needed so that no more than four participants share a screening unit during the training. It is also helpful to have one unit for demonstration purposes. Equipment distributors may be able to provided additional loaner units during the training and may be able to assist with the training. Not all distributors are experienced in screening young children, but they can provide instruction on care and maintenance of equipment, etc. One experienced screener should be assigned to each piece of equipment so that each group of up to four learners will have adequate supervision during the “hands-on” portion of the workshop.

It is also very important to ensure that the equipment is fully charged on the day or evening prior to training.

Prepare teachers, staff, and other participants

Provide classroom teachers with the *Information for Teachers* handout found in the appendix. Since training workshops will be conducted at Head Start centers and will involve actual screening of children as a part of the training process, it is a good idea for classroom teachers and other program staff to be prepared for the training process.

Teachers need to know in advance that the OAE procedure:

- Involves a tiny sound transmitter/microphone being placed in the child’s ear from which the child will hear a clicking or musical tone.
- Does not require the child to respond to the sounds in any way, except to be quiet.
- Will be painless for the child.
- Will take about 3-5 minutes per child.

- Must be done in a relatively quiet environment, but silence is not required.
- May be done while the child is sleeping.

Teachers may facilitate the screening process by:

- Preparing the children for screening by playing a little game in which the children pretend to listen to the sound of a bird or other animal coming from a small toy, or even the teacher's hand. (The game should NOT involve actually placing anything in the child's ear canal.) It is better if the teacher avoids introducing the screening activity by stating anything like, "You are going to have your hearing tested," which is likely to make children feel nervous. It is much better for teachers to tell children that they will each have a chance to "play a listening game." Having rewards such as stickers available after the screening can also be a good idea.
- Recommending an especially cooperative child as the first to be screened, one who can model cooperative behavior during screening for other children.
- Designating a specific area in the room where screening will take place and where something special is set up for the children that will encourage them to sit quietly in this place.
- Occupying the children's hands and attention during the screening process, helping to hold the child, and finding ways to soothe them if they are distressed during the procedure. Having quiet toys available for the children, especially novel ones, can be very effective.

On the day of the training, be sure to visit each classroom prior to starting the training, to meet the teachers and other staff, plan when and where the screening of children will occur and elicit any questions or ideas the staff might have about the training process for the day.

Prepare participants by:

- Providing them with general information on the agenda, hours of the workshop, and that a light breakfast and lunch will be provided
- Providing maps/ instructions describing how to find the training location.
- Advising them that they will be doing "hands-on" screening of children and need to dress comfortably to be able to interact with children, sit on the floor, etc.

Collect and assemble training materials

The following materials will be needed for a training workshop.

1. Screening Equipment: Arrange to have one piece of OAE equipment present at the training for each group of 4 participants (and be sure to have sufficient adult and pediatric probe tips to be used during training) Remember to plug in and charge all screening units prior to the training workshop day.
2. Name tags – These are needed unless a very small group of five or fewer individuals are being trained

3. Instructional Guide* – The Head Start Staff *Instructional Guide* includes all written materials needed by the Head Start participants and includes all key points included in the video as well as a CD-ROM Version of the training video for review purposes.*
4. Training Workshop Agenda* and Training Script – A sample *Training Workshop Agenda* and script are found in the next section of this manual. The script includes all of the content delivered on the video (in the even that the video malfunctions.) The script also includes debriefing questions to be covered after each of the four parts of the training video.
5. Training Video* – One copy of the Training Video is needed for the training workshop.
6. Toys – Silent toys, such as puppets, books, stickers, etc., are helpful in keeping a child occupied during the screening. If possible, provide a new silent toy to go with each piece of equipment.
7. Extra probe tips – There should be enough adult and pediatric probe tips on hand so that all trainees can screen each other and so that all children available during the training may be screened.
8. Zip-lock bags – These are used to store used probe tips and to ensure that tips are removed safely out of children’s reach (tips are small enough that children could swallow them!)
9. Sanitary wipes - These are used for cleaning hands after screening each child.
10. OAE Hearing Screening Forms* - Have at least one screening form for each child who will be screened during the training workshop and one “practice” form for every participant.
11. Workshop Evaluation Forms – *Test Your Knowledge About OAE Hearing Screening* and a *Training Workshop Evaluation* forms can be used to assess each participant’s knowledge about OAE screening and allow them to rate the training experience.

*Handouts and videos for the training can be downloaded or ordered at <http://infanthearing.org/earlychildhood/resources.html>

Conducting the Training Workshop

The following section includes the agenda of the training along with a detailed description of each activity included in the training process.

7:15 – 8:00 Pre-Workshop Preparation: ECHO Team members set up at workshop location.

Workshop Agenda

8:00 – 8:15 Sign-in, breakfast snack and get settled

8:15 – 8:45 Activity 1: Get Started

8:45 – 9:30 Activity 2: Introduce OAE Hearing Screening

9:30 – 9:45 Break

9:45 – 10:15 Activity 3: Practice Hearing Screening

10:15 – 10:30 Activity 4: Introduce OAE Hearing Screening Protocol and Documentation Forms

10:30 – 12:00 Activity 5: Conduct Hearing Screenings with Children

12:00 – 12:45 Lunch

12:45 – 1:15 Activity 6: Review Equipment Care and Maintenance and Helpful Hints for Screening

1:15 – 1:45 Activity 7: Establish a Hearing Screening Data Collection and Tracking Process

1:45 – 2:00 Activity 8: Evaluate the Training



Pre-Workshop Preparation

1. ECHO Team members set up at workshop location 7:15 – 8:00

See the *Workshop Resources* section, for a checklist of set-up activities.

2. Participants Arrive 8:00 – 8:15

- Sign-in
- Breakfast snack
- Get settled



Activity 1

Get Started

8:15 – 8:45

1. **Provide participants with a brief overview** the rationale for periodic, objective hearing screening for children 0 - 3 years of age. The points below can be summarized as a preliminary orientation to participation in the project:

Incidence and implications of hearing loss

- Hearing loss is the most common birth defect in the U.S. and it can also occur at any subsequent time in a child's life. In addition, childhood ear infections can also result in temporary hearing loss
- Unidentified and untreated, hearing loss negatively affects a child's language development, educational achievement, and literacy levels.

Advances in early hearing detection and intervention

- Recent technological advances have made it practical to conduct physiological hearing screening of infants and young children; most babies in the U.S. are now being screened at birth in hospital-based newborn hearing screening programs. A screening procedure called Otoacoustic Emissions (OAE) is now commonly used to screen babies only a few hours old. This same technology can also help identify young children who have permanent or temporary hearing losses.
- Early Hearing Detection and Intervention (EHDI) programs have been established in each state to assist hospitals in their hearing screening efforts and to see that children identified through screening receive timely and appropriate audiological assessment and services.

Implications for continuous screening in Head Start programs

- Head Start has a long-standing requirement that all children served receive a hearing screening within 45 days of entry into the program.
- The technological advances and experiences from hospital-based newborn screening efforts can be expanded into early childhood settings to update screening practices. Periodic screening throughout childhood is critical to assess hearing health.
- Otoacoustic emissions (OAE) is an appropriate physiologic screening tool to use with infants, toddlers, and young children because it is reliable, easy for non-audiologists to use, painless, and does not require a behavioral response from the child.

Overview of the feasibility pilot project

- From 2001-2008, the Administration for Children and Families, Office of Head Start funded a series of projects to assess the feasibility of helping Head Start grantees to use

OAE screening equipment. These projects have been carried out by the National Center for Hearing Assessment and Management (NCHAM). Impressive outcomes were found in terms of the feasibility of updating screening practices and in the numbers of children identified with a wide range of hearing disorders.

- The training materials that will be used today, along with the OAE hearing screening and follow-up protocol and accompanying forms, were developed and tested by NCHAM with more than 100 Head Start grantees across 14 states. The screening protocol was designed specifically to reflect recommendations and guidelines from the American Speech-Language-Hearing Association Audiological Assessment Panel and the American Academy of Pediatrics AND to be practical for Head Start grantees to implement.
 - The success of the original projects funded by the Office of Head Start has led to the dissemination of these training materials to all Head Start programs serving children 0 - 3 years of age.
2. **Introduce the Trainer(s).** Provide a brief description of each member's area of expertise, the role they play on the training team and the role they will play during the training. Briefly introduce the EHDI system, its role and its potential relationship to the Head Start's hearing screening activities..
 3. **Elicit introductions of each participant.** Ask each participant to offer their name, their title, and the role they play in the program.
 4. **Elicit information about current screening practices.** Although this information will have been gathered in preparation for the training, take a moment to ask the participants the following questions:
 - a) What hearing screening methods are you currently using and how have you felt about it up until now?
 - b) Who will actually be doing the hearing screening and who is participating in the training as an administrator who will not actually be doing "hand on" screening of children?
 - c) What is your familiarity with OAE screening?

Build participant confidence that they are like the other diverse participants who have already experienced success in updating their screening practices through the use of OAE technology. Remind participants that this is an informal training process, that the small-group nature of the workshop is intended to make sure that each person leaves with the confidence they need to get started doing OAE screenings.

5. Overview the day. Take a minute to provide an overview of the:

- Objectives of the day: To provide all participant with basic information about the OAE hearing screening process, “hands-on” experience using the equipment to screen young children, and an appropriate screening protocol to follow for children birth to 3 years of age.
- Agenda. See appendix and <http://infanthearing.org/earlychildhood/resources.html>.
- Materials and Equipment. Acquaint participants with the *Instructional Guide* and screening forms that will be used. Explain that all information that will be covered during the workshop is included in these materials. Participants will be asked to share equipment, approximately 3 - 4 individuals per unit. Take a moment now to form equipment-sharing groups.
- Facility and host site policies. Acquaint the participants with where restrooms are, vending machines, and make any other logistical announcements related to compliance with host site policies, etc.



Activity 2

Introduce OAE Hearing Screening

8:45 – 9:30

1. Prepare participants to watch Part 1 of the training video using the following prompt:

Today you'll see a lot of information presented on a video. Don't worry about remembering it all. The same information is included in your copy of the Instructional Guide. In addition, this same video is included on a CD in your Guide so you'll be able to review all the concepts as you need to.

This first segment of the video explains:

- *Why we are screening*
- *How we will be screening*
- *Overview of the auditory system and OAE Screening*
- *The OAE Screening process*
- *The screener's role*

The most important things for you to focus on will be:

- *How the OAE screening procedure can help to identify children who need further hearing assessment, and*
- *Your role as a screener in that process.*

2. Show Part 1 of the training video, *Getting a Hearing Head Start: Updating Early Childhood Hearing Screening Practices*.

(Note that the information in the video appears in the Instructional Guide.)



Pause at the end of Part 1 when prompted.



3. Review important concepts.

Spend a minute or two reviewing important concepts and answering any questions participants may have about this segment. Avoid getting into very detailed explanations about the auditory system—remember that participants are learning to be screeners and therefore need to understand only general concepts of how the hearing system and OAE screening work. Help participants focus on basic concepts, using the prompts provided below to elicit their responses:

Let's review a few key points from the video:

- ? *The three main parts of the ear that normally transmit sound to the brain are. . ? (The outer ear. . . the middle ear. . .and the. . .inner ear or “cochlea.”)*
- ? *In a healthy ear, where the inner ear is functioning normally, the cochlea sends the sound signal to the brain and it simultaneously. . .? (emits an echo that can be measured by sensitive equipment.)*
- ? *If there is excessive wax or debris in the child's ear canal, blocking the sound going in to the cochlea or the emission coming back out, the screening result will be. . .? (“Refer” because no measurable OAE is present.)*
- ? *If the middle ear is filled with fluid--often associated with middle ear infection-- the screening result will be. . .? (“Refer” because no measurable OAE is present.)*
- ? *If the cochlea isn't functioning properly, the screening result will be. . . (“Refer” because no measurable OAE is present.)*

4. Prepare participants to watch the Part 2 of the training video using the following prompts:

During Part 2 of the video, you are going to see a variety of types of hearing screening equipment demonstrated. The important concepts to learn are that:

- *Even though there are various types of portable OAE screening equipment on the market, they share common elements.*
- *No matter which type of equipment you will be using, the screening process is very similar.*
- *Screening can be broken down into a simple step-by step process.*

Do not worry about assembling your equipment until we turn the video off. At that time, we will go through the entire process of operating your equipment as we practice using it on each other.

Divide participants into screening teams of up to 4 individuals in preparation for later practice and invite them to open their carrying cases so they can view the equipment. Designate one member of the ECHO Team to be the coach for each team.

5. Show Part 2 of the training video, *Getting a Hearing Head Start: Updating Early Childhood Hearing Screening Practices*. (Note that the information in the video appears in the *Instructional Guide*.)



Pause at the end of Part 2 when prompted.



6. Demonstrate OAE Screening

Using a member of the ECHO Team who typically passes on OAE screening (if possible); ask the person to sit in the demonstration chair.

Verbally walk participants through the various screening steps as you demonstrate each one:

- a) Prepare the environment--have a place for the child to sit, a place to put the equipment and supplies, toys, and a place to write the results. Emphasize the importance of preparing this in advance, noting that the time children will wait for you to get organized is minimal.
- b) Visual inspection of the ear and ear canal--note what you are looking for.
- c) Select probe “tip” or “cover”--select the largest tip for the ear as that is likely to create a better seal--this will NOT increase discomfort for the child--note that selecting probe tips is something that screeners will learn to do over time. Even experienced audiologists sometimes have to try a couple of different tips before they get the right one for a given child.
- d) Place the probe tip firmly on the probe--if using a foam tip, demonstrate that the tip should be compressed to form a mushroom shape before insertion in the ear canal.
- e) Insert the probe in the ear canal--emphasizing the importance of a snug fit that enables you to remove your hand from the probe once it is in the ear and that the goal is to seal the ear with the probe tip.
- f) Start the screening process by pushing the appropriate buttons.
- g) Describe the result and, if possible, show participants the display screen.

Repeat the demonstration on the other ear. Point out that: *You can use the same probe tip on both ears of a single individual but you should NEVER use the same probe tips ACROSS more than one individual for disease control purposes.*

Break

9:30 – 9:45



Activity 3

Practice Hearing Screening

9:45 – 10:15

During this section of the training, participants will have their first opportunity to learn to use the screening equipment by screening each other's ears. Complete this activity by doing the following:

- 1. Overview the screening process, which includes four primary elements:**
 - a) Preparing the screening environment.
 - b) Assembling/preparing the equipment and materials.
 - c) Performing the screening (including visual inspection and the OAE screening).
 - d) Documenting screening results (will be covered in Activity 4).
- 2. Engage training assistants (if you have them) in assisting the participants.**
- 3. Instruct the participants to:**
 - a) Identify one person who will be screened and one who will do the screening.
 - b) Prepare the screening environment.
 - c) Prepare equipment and materials, including turning on the screening equipment.
 - d) Complete visual inspection.
 - e) Select probe tip, pressing it firmly over the end of the probe.
 - f) Attach cord to clothing.
 - g) Insert probe tip firmly in the ear canal.
 - h) Start the test.
 - i) Observe the screening equipment to note how the test is progressing.

Repeat on other ear. Then switch roles and have the person who was screened perform the screening. Complete this process until all members have performed several screenings and have also had a chance to experience having their own ears screened. You will probably want to reassure participants in advance that the OAE screening tool is optimal for screening children, but is not optimal for screening adults so they should not be alarmed if their ears do not pass.

4. Debrief

Elicit comments and questions from each practice team and their coach. The following are commonly asked questions during the first practice experience and potential responses:

- **Why might some adults refer during an OAE screening?** While OAE technology is the best tool available for screening the hearing of children 0 -3 years of age, it is not the optimal screening procedure for adults. It's not uncommon for adults to refer on an OAE screening for a variety of reasons--most of which would not warrant follow-up diagnostic evaluation.

- **What do the various error messages on the screen mean?** The error messages are usually telling you something about the probe fit and/or the amount of noise that is interfering with the screening process, but the messages are not always completely specific or accurate. Therefore, when you get an error message, the important thing is to try again, making sure you are using the largest probe tip possible, that the probe is clear of wax or other debris and connected firmly with the screening unit, and that you have the probe inserted snugly so that it remains securely in the ear canal after you release it.
- **Why can't you hold the probe in the ear?** Attempting to hold the probe is not a successful screening strategy because it can easily cause the probe tip to press against the ear canal wall, thus interfering with the screening
- **How do you know what size of probe tip/cover to select?** It is impossible to select the right probe tip 100% of the time. Occasionally even very experienced audiologists will try multiple tips on a given child in order to get the optimal fit. Selecting the right size probe tip is something you will learn with experience.
- **Won't selecting a probe tip/cover that is too large hurt the child?** No, in fact, the opposite is true. The inner portion of the ear canal is the part that is the most sensitive, so if a probe tip is too small, and the probe is therefore inserted too deeply, that is more likely to cause discomfort than using a larger tip would.
- **Won't you hurt the person being screened if you pull on the fleshy outer portion of the ear as you examine the ear and place the probe tip?** Most people are more timid than they need to be at first. Pulling back or stretching the fleshy portion of the ear typically does not cause pain in a healthy ear and it helps to open up the ear canal to accept the probe. And, when you examine an ear confidently, the child will be less likely resist the process.
- **If you get a "refer" or "fail" result, what should you do?** Try again! Assuming the child continues to cooperate, it is always a good idea to examine the probe tip for debris (changing to a different probe tip size if the fit seems too loose), reinsert it, and try screening again immediately, since a "refer" can result from poor probe fit, extraneous noise, or excessive child movement. Always double check your "refer" or "fail" results by obtaining them one or two additional times during the screening session if possible.
- **If you get a "pass" result, is there a chance that this is not valid?** A pass is the most reliable result you will get from an OAE screen. Once you receive a pass, you do not need to rescreen.



Activity 4

10:15 – 10:30

Introduce OAE Hearing Screening Protocol and Documentation Forms

1. Prepare participants to watch Part 3 of the training video using the following prompt:

In this next segment of the video you'll be introduced to the hearing screening protocol.

Don't worry about trying to remember every detail of the protocol--the forms you will be using to document screening outcomes will lead you through that process for each child. The important things to pay attention to in this segment are that:

- *You need to conduct more than one screening session with some children who do not pass during the first OAE screening attempt.*
- *You need to screen or rescreen children who have been treated/cleared by their health care provider.*
- *There are simple things you can do to increase your effectiveness as a screener and minimize the number of children who need to be rescreened or referred.*

2. Show Part 3 of the training video, *Getting a Hearing Head Start: Updating Early Childhood Hearing Screening Practices*.

(Note that the information in the video appears in the *Instructional Guide*.)



Pause at the end of Part 3 when prompted.



3. Walk participants through filling out an OAE Hearing Screening Form documenting the results of their own recent hearing screening. You may want to have participants turn to pages 19 - 23 in their *Instructional Guide* as you discuss each item on the Screening Form.

- a) Head Start Center ID—This is used if you are collecting data across program sites.
- b) Child's Name—Fill in the name of the individual screened.
- c) Initial Screen or a Rescreen—Check one of two boxes: For an Initial screen, fill out additional demographics related to the date of birth, ethnicity, and gender as well as whether the child was known to have been screened at birth and, if so, the results.
- d) Screener Name and Title-- Fill in the name and title of the person conducting the screening.
- e) Location of screening—Check the box to indicate whether screening is conducted in a home, Head Start Center, or “other” location.
- f) Screening Results/Left Ear and Right Ear
 - **Visual Inspection:** If Refer, note screening date and make appointment with Primary Care Provider; if Pass, continue with OAE screening.

- 1st OAE: If Can't Test or Refer, screen again within a 2 week period; if Pass, screening is complete, no further action needed.
- 2nd OAE: If Can't Test or Refer, refer to a health care provider; if Pass, screening is complete, no further action needed.

(Note: Using discretion, programs may refer child to the Primary Care Provider after the 1st screening. For example, if parents have concerns about the child's ability to hear; if the family will be moving in the near future; if the Head Start program will be closing shortly; and/or if it will not be possible to complete the screening in a timely way, programs may choose to refer the child before completing two screening sessions.

- g) Children Referred for Medical Follow-up MUST be rescreened after clearance from their Primary Care Provider. If the child was treated for ear infection, it is best to wait 4 – 6 weeks until excess fluid in the middle ear has had time to dissipate. If the child does not pass screening after medical clearance, make an appointment with a Pediatric Audiologist.
- h) Approximate total time required for screening—Estimate the number of minutes required to complete the visual inspection, the OAE screening for each ear, and to document screening results.

3. Discuss the Diagnostic Follow-up Form. A Diagnostic Follow-up Form will need to be completed on a smaller number of children (probably no more than 10%) who are referred from screening for medical or audiological care. (Note that instructions for the Follow-up Form can be found in the *Instructional Guide*.) When a child refers from screening, it is a good time for the Head Start program to ensure that the child has a Medical Home with a health care provider who can oversee the child's ongoing care. To obtain this follow-up information, the Head Start program may choose to:

- Send a blank copy of the Follow-up Form with the child to the referral appointment and request that the provider fill it out and return it to the program, or
- Call the provider after the appointment to find out the results and document them on the Form.

In any case, it is very important that both the Head Start program obtain and document the results of every referral and what “next steps” for a child the primary care provider or audiologist recommends. Reinforce to participants that as their consulting Audiologist you will be glad to assist them in understanding/interpreting referral results and what needs to happen next to provide the child with timely and appropriate care.

4. Review important concepts. Spend a minute or two reviewing important concepts and answering any questions participants may have about the protocol. Help participants focus on basic concepts, using the prompts provided below:

Let's review a few key points from the video:

? *If a child does not pass the OAE screening during a screening session, what needs to happen next? (Referral to a health care provider.)*

- ? ***If a child is referred to a health care provider, why do you need to rescreen after treatment/medical clearance?*** (Most health care providers do not have the proper equipment to assess cochlear function.)
- ? ***If a child is treated for middle ear infection, why should you wait at least 4 weeks before conducting a rescreen?*** (Allow time for middle ear fluid to dissipate.)
- ? ***What are the three keys to conducting effective screening?***
(Good probe fit, minimizing external noise in the environment, minimizing internal noise caused by the child's movement.)



Activity 5

10:30 – 12:00

Conduct Hearing Screenings with Children

1. **Assemble participant teams** and prepare them for the screening activity.
2. **Provide teams with necessary materials** (screening forms, probe tips, sanitary wipes, toys, zip-lock bags). Reiterate the purpose of each of the materials.
3. **Discuss the logistics of how the screening will be conducted** eliciting input from the host site representatives on where each team should set up their screening “stations,” how children will be brought to the screening stations, and what child identification numbering system should be used on Screening Forms, if any.
4. **Instruct teams to complete a screening form on each child who is screened** (or on any child who they attempted to screen).
5. **Elicit and answer any questions from participants** before dispersing to conduct screenings.
6. **Inform participants of the time at which the group will** reassemble in the training room to debrief the experience and have lunch.
7. **Debrief the hearing screening experience** with participants after they reassemble. Ask participants what worked well for them, what they found challenging, and to share any observations they have on effective screening strategies.

Lunch

12:00 – 12:45



Activity 6

12:45 – 1:15

Review Equipment Care and Helpful Hints

1. Prepare participants to watch Part 4 of the training video using the following prompt:

In this final segment of the video, we'll cover some important elements related to care of your screening equipment and helpful hints that will make screening easier. Points to pay particular attention to include:

- *How to maintain the probe, which is the most fragile part of the equipment.*
- *The importance of running regular calibration checks on your equipment (if applicable to the type of screening equipment participants will be using.)*
- *The need to have screening equipment recalibrated on a yearly basis.*
- *Helpful hints for being an effective screener; ideas for screening the small number of children who are difficult to screen.*

2. Show Part 4 of the training video, *Getting a Hearing Head Start: Updating Early Childhood Hearing Screening Practices*.



(Note that the information in the video appears in the *Instructional Guide*.)

Note that the first portion of Part 4 demonstrates a manual calibration check which is needed for some equipment. If the equipment being used in your training does not require regular manual calibration checks, you may fast forward through this portion of Part 4.

Stop at the end of Part 4, which is the conclusion of the training video.



3. Review specific equipment care information, provided by the manufacturer, for the equipment used in this particular training. There are a number of equipment-specific issues that could not be addressed adequately in the training video, so use this opportunity to discuss and demonstrate:

- How to clean and maintain the probe (some probes must be cleaned with a cleaning wire when they become clogged; others have small filters or nozzles that can be changed.)
- How to run a calibration check on the equipment at least weekly. Note that not all equipment models require weekly manual calibration checks. Check the manual for the equipment being used to see if this is required. If so, demonstrate the process and have the participants follow along running a calibration check on their own equipment. Describe the message they should see if the equipment is functioning properly and the message that may appear if the equipment is not functioning properly.
- When and how to have the equipment calibrated by the manufacturer. Provide details of the costs associated with recalibration and what programs need to do to receive this maintenance.

- How to order additional probe tips. Direct participants to the product information that describes how and where additional tips can be purchased. Remind participants NOT to wait until the last minute before screening to order additional tips.
- Other issues relevant to the specific model of screening equipment being used.

1. Raise and respond to commonly-asked questions about screening, including:

- **Should children who have Pressure Equalization (PE) tubes be screened?** OAE hearing screening may and should be performed on children who have PE tubes. Some equipment models need to be adjusted when screening a child with PE tubes. Check the equipment manual for this information. PE tubes are often inserted through the eardrum of children who have chronic middle ear infections or other problems affecting the middle ear system. PE tubes ventilate the middle ear space, allow fluid to drain out, and help to equalize the pressure in front of and behind the eardrum. Children whose PE tubes are functioning properly, and are not occluded, will generally pass the OAE screening indicating that the middle ear is healthy. An OAE screening "refer" result may indicate that a PE tube is not functioning properly and that the child needs to be referred to a health care provider for a middle-ear evaluation,
- **How often should screenings be conducted?** Each Head Start program is required to ensure that all children receive a hearing screening within 45 days of enrollment and at least annually. Depending on their capacity, programs may opt to screen more frequently. In any case, all programs should be encouraged to constantly be aware of children's hearing health and to screen an individual child whenever a parent indicates concern over hearing or language development, there is a history of childhood hearing loss in the family, a tendency toward repeated ear infections, or if the child experiences head trauma or an extended illness involving high fever. Programs need to think of the OAE equipment as a valuable tool they can use at their own discretion to screen for hearing health.

5. Encourage participants to enlarge their "screening repertoire" when they return to their home sites by trying different screening strategies, including:

- Creating a "kit" of age-appropriate, visually interesting toys that are kept with the screening equipment. For example, younger children are usually most attracted to simple, colorful toys, or may be attracted to something as simple as a sticky ball of masking tape! Slightly older children will like to watch or play with finger puppets and may also enjoy watching the face of the screening equipment or "helping" with the screening by pushing the buttons.
- Screening during naptime.
- Screening in different environments. Some children will respond best if they are in an environment where they are not being distracted by their peers. Other children enjoy watching the screening process and "taking turns" having their ears screened. When screening in a home environment, screeners may need to be able to "take charge" and enlist parents in turning off the TV and radio and/or keeping other children quiet or entertained in another room.
- Techniques for eliciting cooperation from difficult-to-screen children described in the *Instructional Guide*.

6. Acquaint participants with additional resources included in the *Instructional Guide*:

- Information for teachers
- Sample Letters for parents and physicians
- Screening log
- Mini-grant proposal



Activity 7

1:15 – 1:45

Establish a Hearing Screening Data Collection and Tracking Process

- 1. Provide each Head Start program with Hearing Screening and Diagnostic Follow-up Forms based on the numbers of children, 0 – 3 years of age, they anticipate screening at their program.** Programs will need at least one screening form for each child enrolled, with extras for children who will be rescreened after referral for medical care (approximately 10%). They will also need a similar number of Diagnostic Follow-up Forms for documenting the findings and treatments associated with referrals.
- 2. Elicit information from each Head Start program about their plans for starting hearing screening.** Find out when they will begin and by what date they anticipate submitting their first set of completed Screening Forms to the project.
- 3. Discuss how the screening and follow-up information will be used in their current data base tracking systems.** Encourage programs to add necessary fields in their tracking systems so that all information from the screening forms can be entered.
- 4. Discuss the importance of prompt follow-up and what mechanisms can be used to ensure that children not passing the OAE screening are referred to health care providers AND that subsequent diagnostic and treatment information is obtained back from health care providers.** This is critical so that rescreening can be done in a timely way. It is important to remind participants that all children referred to health care providers as a result of not passing the OAE screening **MUST BE RESCREENED** after medical clearance. If children still do not pass the OAE screening, they will need to be referred to a pediatric audiologist for a complete evaluation. Talk about how these processes can be tracked and referrals expedited.



Activity 8

Evaluate the training

1:45 – 2:00

- 1. Discuss how the consulting audiologist and other members of the training team can support subsequent hearing screening and follow-up processes, including:**
 - Screening Practices
 - Referral Practices
 - Community Outreach
 - Equipment Concerns
 - Individual Case Consultation
 - Administrative Duties
 - Monitoring for quality (pass/refer rates, adherence with protocol etc.)
- 2. Elicit final questions and feedback about how effective the training experience was for participants.**
- 3. Have each participant complete the OAE Knowledge Test found on pages 32-33 of the *Instructional Guide*. Review the answers once completed.**
- 4. Have each participant complete the Training Workshop Evaluation found in the Appendix and on the website.**

Within FOUR WEEKS of conducting a training workshop, contact the program to inquire about the following:

1. Have screening activities been initiated? If so, how is it going? If not, what barriers are being encountered and what assistance might be helpful?
2. Has the program established a mechanism for documenting and tracking screening outcomes using their program's data base tracking systems?
3. Has the program undertaken any activities to inform local physicians/pediatricians about the OAE screening process? Do they need assistance in doing so?
4. What questions (if any) do screeners have about the screening and documentation process?
5. Is the program:
 - a. Conducting OAE screening as the first and primary screening method?
 - b. Conducting OAEs on all children birth to three years of age and documenting all results (pass, refer and can't test)?
 - c. Understanding the importance of promptly conducting additional screening when necessary?
 - d. Understanding the importance of rescreening children after referral to/clearance from health care providers, and the time frame within which rescreening should occur?
 - e. Aware of who to contact should they need assistance?
6. Arrange for follow-up technical assistance to be provided. Technical assistance may be provided via telephone, e-mail, video conferencing or face-to-face meetings.

Common Technical Assistance Topics

Programs initiating OAE screening will often need follow-up technical assistance related to achieving appropriate pass/refer rates, compliance with protocol, and other areas covered under Monitoring Screening Program Quality (see appendix). In addition, programs may need assistance with the following:

Screening Protocol and Practices

- Strategies for home-based screening practices. Screening successfully in a home may require some unique strategies and screeners may need further instruction on how to “take control” (turning volume down on a TV, enlisting parents or adults who may be present in keeping other children quiet) to create an appropriate screening environment.
- Strategies for working with difficult-to-screen children. Programs often need to discuss and be reminded of alternate strategies that can be used with the small number of children who are resistant to having a probe placed in their ear. Assistance can take the form of advice or “helpful hints.” In unusual circumstances, this might require directly helping the program screen a child or setting up an appointment where a behavioral assessment can be done.

Community Outreach and Interaction with Physicians and Audiologists

- Helping to establish relationships with local audiologists and medical providers. Encourage programs to meet with medical providers and audiologists who will receive the majority of their referrals to involve them in the “project” and to make mutually agreeable decisions about how referrals (and information sharing as a result of referrals) will be handled.
- Expediting a referral when a medical professional is not responding in a timely way. State or other publicly funded programs may be able to offer diagnostic or treatment services without first obtaining a physician’s referral. Help programs use available options to connect children with the services they need.
- Clarifying the Medical Home concept when Head Start grantees may erroneously assume that health care providers have the capacity to provide hearing screening to infants and young children. Help participants to understand that most care providers serving as a Medical Home will welcome additional information provided by the OAE screening.

Equipment Concerns

- Answering questions about equipment functioning, supplies, and maintenance. Head Start programs often need additional information related to ordering equipment supplies (especially probe tips), and the appropriate source to contact for equipment maintenance.
- Providing input on the selection of hearing screening equipment and options for funding. Larger programs may want or need to purchase more than one piece of screening equipment. Assist sites in talking through current equipment options and

how they meet program needs using the information entitled “*Elements to Consider in Handheld OAE Equipment Purchases*” found in the appendix.

- Interacting with hearing screening equipment manufacturers/distributors. Head Start program staff will rarely have experience working with salespersons. It will be important to offer support and information to programs on how what to expect/require from vendors when purchasing equipment and supplies.

Individual Case Consultation

- Interpreting screening, medical or audiological evaluation results and determining “next steps.” Consider ways that the ECHO team can support programs when medical or audiological reports are provided, but are not written in clear language that helps Head Start providers understand what needs to happen next.
- Reviewing screening results and prompting follow-up on cases that are pending.

Administrative Duties

- Helping programs coordinate screening activities, share equipment, etc.
- Assisting with parent education (keeping it short and simple!)
- Supporting programs when they experience staff turnover – possibly by providing additional training when additional screeners need to be trained.

CONDUCT FOLLOW-UP DEBRIEFING AND TECHNICAL ASSISTANCE MEETING

After programs have had several months to implement their OAE screening program, it will be helpful to meet (either by phone or in person), to debrief their experiences and provide additional training and technical assistance in areas of concern. After gaining screening experience, participants will be ready to expand their knowledge base, refine their screening skills, and strengthen their referral and follow-up practices.

The topics for a follow-up meeting should be responsive to issues that are being raised by program participants, but should also the technical assistance topics listed above.

Note that it may be advantageous to conduct the follow-up meetings with several programs in attendance. This allows programs to begin to support and learn from one another’s experiences, feel part of a larger initiative, and will also be an efficient use of ECHO Team members’ time.

The following is an example of agenda items used during a one-day follow-up meeting conducted as a part of the pilot project.

Sample Agenda

Overview of Current Screening Activities

Review the current, collective results of the project and discuss them with participants (examine refer rates, average length of time between screenings, average length of times for referral appointments to occur, and types of conditions identified).

Booster Session on Hearing Screening

Review specific aspects of the screening process, including the screening protocol, screening process, tracking forms, and care and use of equipment. Address questions on how to conduct OAE screening as efficiently as possible and discuss options for documenting screening outcomes.

Hearing Screening Challenges and Successes

In addition to dealing with hands-on screening processes, examine programmatic issues, planning, and intra-team collaboration that supports a successful screening program.

Medical and Audiological Referral Issues / How Often Should you Screen?

Once every child is screened initially, how and when will programs incorporate hearing screening into other routine screening activities? How often will all children be screened? Should some children be screened more often than others? This session will focus on indicators that will help programs identify children who may need more frequent OAE screening, and on how to ensure that children have a Medical Home.

Explore the challenges and successes programs are experiencing when referring children to physicians and audiologists for follow-up services. Discuss ideas for how to educate the medical community about hearing screening efforts, as well as ways to establish collaboration among the early childhood, medical and audiological communities at the state and local levels.

Managing Follow-up Screening Needs

Adequately following children who refer on OAE screening or who are believed to be at-risk for hearing loss, is a challenge faced by anyone engaged in hearing screening programs. Acquaint participants with the Early Hearing Detection and Intervention efforts in their state, issues they experience regarding follow-up screening, ways which newborn and early childhood hearing screening programs can work together effectively, and the resources that are commonly tapped into once children are identified with a hearing loss. Invite programs in advance to prepare to discuss specific cases (appropriately protecting child confidentiality) and to elicit assistance and feedback from the audiologist consultants.

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OAE Hearing Screening Form – 2 Step Protocol

Center ID _____ Child's Name _____

Child Information	Child's ID # _____	Date of Birth: (___/___/___)
Indicate whether Initial Screen, Periodic Rescreen, or Follow-up Rescreen, and provide corresponding information:		<input type="checkbox"/> Male <input type="checkbox"/> Female
<input type="checkbox"/> Initial Screen – Screened for hearing loss at birth? <input type="checkbox"/> Unknown <input type="checkbox"/> Not screened <input type="checkbox"/> Passed <input type="checkbox"/> Referred <input type="checkbox"/> Follow-up Rescreen – Performed after referral for Medical or Audiological Follow-up <input type="checkbox"/> Periodic Rescreen – <input type="checkbox"/> Annual <input type="checkbox"/> Semi-annual <input type="checkbox"/> Other _____		

Hearing Screening Data	 Screener: Name _____ Title _____	 Location: <input type="checkbox"/> Home <input type="checkbox"/> Daycare setting <input type="checkbox"/> Center <input type="checkbox"/> Other _____ <input type="checkbox"/> Part C Program
-------------------------------	--	--

Child's LEFT Ear	
<p>1 Visual Inspection</p> <p><input type="checkbox"/> Refer — Date (___/___/___) _____</p> <p><input type="checkbox"/> Pass</p> <p>2 1st OAE 2nd OAE</p> <p>Date (___/___/___) (___/___/___)</p> <p><input type="checkbox"/> Can't test <input type="checkbox"/> Can't test</p> <p><input type="checkbox"/> Refer <input type="checkbox"/> Refer</p> <p><input type="checkbox"/> Pass <input type="checkbox"/> Pass</p> <p>Notes: _____</p>	<p style="text-align: center;">Follow-up</p> <div style="border: 1px solid gray; padding: 5px; background-color: #e0e0e0;"> <input type="checkbox"/> Medical — (___/___/___) Target date Rescreen after medical treatment & record results on additional Screening Form. </div> <p style="text-align: center; font-size: small;">If OAE Rescreen following medical treatment does not result in a Pass</p> <div style="border: 1px solid gray; padding: 5px; background-color: #e0e0e0;"> <input type="checkbox"/> Audiological — (___/___/___) Target date If child has a permanent hearing loss, refer to Early Intervention. </div>

Child's RIGHT Ear	
<p>1 Visual Inspection</p> <p><input type="checkbox"/> Refer — Date (___/___/___) _____</p> <p><input type="checkbox"/> Pass</p> <p>2 1st OAE 2nd OAE</p> <p>Date (___/___/___) (___/___/___)</p> <p><input type="checkbox"/> Can't test <input type="checkbox"/> Can't test</p> <p><input type="checkbox"/> Refer <input type="checkbox"/> Refer</p> <p><input type="checkbox"/> Pass <input type="checkbox"/> Pass</p> <p>Notes: _____</p>	<p style="text-align: center;">Follow-up</p> <div style="border: 1px solid gray; padding: 5px; background-color: #e0e0e0;"> <input type="checkbox"/> Medical — (___/___/___) Target date Rescreen after medical treatment & record results on additional Screening Form. </div> <p style="text-align: center; font-size: small;">If OAE Rescreen following medical treatment does not result in a Pass</p> <div style="border: 1px solid gray; padding: 5px; background-color: #e0e0e0;"> <input type="checkbox"/> Audiological — (___/___/___) Target date If child has a permanent hearing loss, refer to Early Intervention. </div>

Time Data	Approximate total time with child required for screening (in minutes): 1st OAE _____ 2nd OAE _____
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Diagnostic Follow-up Form

CENTER ID _____ CHILD'S ID # _____ CHILD'S NAME _____

FOR MEDICAL EXAM ONLY

Date: (__/__/__) MD Name of person performing service: _____

Medical service(s) performed: _____

Otoscopy Pneumatic Otoscopy Tympanometry Other _____

Diagnosis: Normal Exam Cerumen Middle ear disorder (describe): _____

Other: _____

Follow-up Recommendation(s) and date by which recommendation should be completed: (check all that apply)

- | | | | |
|---|--------------|---|--------------|
| <input type="checkbox"/> None | | <input type="checkbox"/> Audiological evaluation | (__/__/__) |
| <input type="checkbox"/> Repeat hearing screening | (__/__/__) | <input type="checkbox"/> Referral to Early Intervention | (__/__/__) |
| <input type="checkbox"/> Further medical evaluation | (__/__/__) | <input type="checkbox"/> Other _____ | (__/__/__) |
| <input type="checkbox"/> Medical treatment | (__/__/__) | | |
- (describe) _____

FOR AUDIOLOGICAL EXAM ONLY

Date: _____ Name of person performing service: _____

Audiological services performed: ABR Behavioral Other _____

Hearing Status: Not yet confirmed Normal hearing, no loss Hearing loss (circle type & degree below)

Type Left ear: fluctuating conductive / permanent conductive / sensorineural / mixed / normal

Right ear: fluctuating conductive / permanent conductive / sensorineural / mixed / normal

Degree Left ear: mild / moderate / severe / profound / normal

Right ear: mild / moderate / severe / profound / normal

Follow-up Recommendation(s) and date by which recommendation should be completed: (check all that apply)

- | | | | |
|---|--------------|--|--------------|
| <input type="checkbox"/> None | | <input type="checkbox"/> Further audiological evaluation | (__/__/__) |
| <input type="checkbox"/> Repeat hearing screening | (__/__/__) | <input type="checkbox"/> ABR <input type="checkbox"/> Behavioral | |
| <input type="checkbox"/> Further medical evaluation | (__/__/__) | <input type="checkbox"/> Referral to Early Intervention | (__/__/__) |
| | | <input type="checkbox"/> Other _____ | (__/__/__) |

Additional Notes: _____

To the Audiologist or Physician:

A. Please complete this form and return all copies to:

Name: _____

Address: _____

B. Inform the Screening Coordinator of results:

Name: _____

Phone: _____

**The completed form should be returned as soon as the initial evaluation is completed,
but no later than 4 weeks from the date of referral.**

Elements to Consider When Purchasing OAE Equipment

A variety of OAE equipment options exist from different manufacturers. It is important to note that not all OAE equipment has been designed to be equally effective for use with 0-3 year olds in early childhood educational settings. Carefully review the equipment selection criteria below:

Portability

- Is the equipment handheld with no loose parts?
- Does the equipment come with a carrying case that allows the equipment to be easily packed and unpacked to minimize cord damage and the need to disconnect the probe from the screening unit?

Capability

- Does the equipment screen quickly? (Average time of 2 minutes or less per ear on a cooperative child.)
- Can the equipment run on either battery or on direct connection to a power source?
- How long does the battery maintain a charge? (Should hold a charge for 3 hours of testing or be able to perform 50-100 tests before needing to be recharged.)
- How long does it take the battery to charge? (Should fully charge in 3 hours or less.)
- Is the equipment simple, featuring only the essential capabilities you need for your OAE screening program? (For example, some equipment can be used to do diagnostic testing or automated auditory brainstem response [AABR] screening. This would be beyond the scope of your screening program and you would most likely be paying for capabilities you would not need. Likewise the equipment may have a printer and/or other data management cabling capabilities. Thoughtfully consider which additional components will be useful to you and which will add cost but not significant convenience.)

Ease of Use

- Is the equipment easy to turn on and use right way?
- Does the display allow you to quickly begin, stop and restart tests?
- Does the display tell you if the probe fit is good, poor or if there is too much noise?
- Does the display show you how a test is progressing?

Probe

- Is the probe easy to clean and service?
- Is the probe easy to place in the ear?
- How well does the probe stay in place when the child moves?
- Is the cord length from the machine to the probe long enough (48" or longer)?
- Does the probe cord have a "clip" that will allow you to attach the cord to the child's clothing, thus keeping the cord weight from pulling the probe from the child's ear, and leaving the screener's hands free to run the equipment and work with the child?
- Does the probe come with a wide selection of probe tip covers for all ages of children and adults?
- Are the probes and probe covers designed to minimize the occurrence of wax or debris plugging the probe openings?

Manufacturer Support

- ❑ Will the manufacturer and/or distributor allow you to use the machine on a trial basis prior to purchase?
- ❑ Will the distributor provide “hands-on” in-service, and any follow-up visits if needed, as part of the purchase?
- ❑ Is the manufacturer’s warranty satisfactory?
- ❑ Does the distributor provide a service contract that provides quick, reliable repair and includes loaner equipment if the equipment must be returned to the manufacturer for more extensive repair?
- ❑ Does the equipment come with sufficient training materials such as a training video, user’s guide and quick reference sheet?
- ❑ Are software upgrades provided when released?

Purchase and Maintenance Costs

- ❑ Is the equipment affordable? (Should cost no more than \$3,500 to \$4,000.)
- ❑ Are the probe covers (tips) reasonably priced?
- ❑ Is a second probe, or a replacement microphone (the most expensive part of the equipment), included in the purchase price? (What is the cost of a replacement probe or microphone?)
- ❑ Is annual calibration of the equipment affordable and convenient?
- ❑ Is it possible to quickly check calibration on the machine (on site check)?
- ❑ Are software upgrades included in the purchase price? (If not, what is the estimated cost for software upgrades?)

Training Workshop Planning and Preparation Checklist

Identify a program to host the training that:	
	Has enough young children on site, ranging in age, so that each participant can practice screening at least 5 children each
	Is accessible to all potential participants, individuals with disabilities
	Has access to restrooms
	Permits refreshments/lunch to be served on site
	Has a relatively quiet, distraction-free environment for the meeting (conference room, empty classroom with moveable chairs, etc.) with sufficient space, tables, and chairs
	Has electrical outlets available for plugging in equipment if necessary
	Has a TV-VCR that can be used during the training
Schedule the training workshop:	
	On a day acceptable to the host site and participants
Schedule and plan specific workshop activities:	
	Arrange for morning breakfast snacks/drinks
	Arrange for lunch/drinks
	“Hands on” screening practice to occur approximately 2.5 hours after the beginning of the training and at a time that fits with the children’s schedules (mid-morning usually works best so that screening is completed before lunch.)
Obtain screening equipment	
	Arrange for sufficient OAE equipment so that no more than 4 participant trainees are sharing a single piece of equipment. Also have 1 demonstration unit available.
	Be sure to charge batteries in the OAE equipment the day/night before the training
Prepare teachers, staff and other participants	
	Provide host site with information about preparing teachers
	Ask about any special procedures screeners will need to follow such as the use of foot covers in infant areas, where participants should park, etc.
	Provide participants with general information on the agenda, hours of the workshop, and that a light breakfast and lunch will be provided
	Provide participants attending the training with maps on how to find the training location.
	Advise participants they will be doing “hands-on” screening of children and need to dress comfortably to be able to interact w/children, sit on the floor, etc.

Workshop Materials Checklist

The following is a list of materials needed for each training workshop.

Provide 1 for each training session	
	Sign-in sheet
	Training Video
_____ # of pieces of equipment to be used in training workshop (provide 1 for each piece of equipment)	
	Training video
	Set of Screening Forms (enough copies with each piece of equipment to cover the number of children programs will be screening after the training.)
	Set of Follow-up Forms (enough copies with each piece of equipment to cover approximately 10% of children who will be screened who may also need to be referred for Follow-up.)
	Toys (silent toys--use during screenings and send home with equipment)
	Extra probe tips (adult & pediatric, enough for trainees to screen each other and to screen children of a variety of ages at the host site)
	Sanitary wipes (for cleaning hands prior to each child being screened)
	Zip lock bags (for used probe tips and wipes)
_____ # of participants (provide 1 for each participant)	
	Workshop Agenda
	<i>Instructional Guide</i>
	Name Tags
	Test Your Knowledge about OAE Hearing Screening
	Workshop Evaluation form
_____ # of children to be screened during the training workshop _____ # of workshop participants (provide enough copies of screening forms to cover the number of children that will be screened at the host site, 1 per child, plus 1 "practice" copy for each participant.)	
	Screening Forms

Training Workshop Day—Set-up Checklist

Meet host site staff; view host site facility:	
	Introduce the trainer(s) to all key host site staff, meet teachers, provide staff with information on OAE screening if that was not done previously.
	Review host site preferences and policies, including sign-in policies, parking, procedures to be followed when working with children, use of foot covers in infant areas, etc.
	Determine where screening can best be conducted; confirm the time when children will be available for screening.
Set up the meeting room:	
	Arrange tables in a semi-circle or U-shape that permits people to interact and for small clusters of 2 - 4 individuals to share a piece of equipment.
	Position the TV-VCR or Laptop in the front of the rooms so that people can watch the video while also glancing at the equipment that is on the table in front of them.
	Locate electrical outlets to plug in equipment if necessary.
	Set up table on which breakfast refreshments, drinks, and lunch can be served.
	Set up a place for participants to sign in and receive a name tag upon arrival.
	Set-up a table and chair for equipment demonstration.
Equipment:	
	Set up TV-VCR, insert tape or Lap top, test it, and make sure volume is set.
	<i>*Be sure to charge batteries in the OAE equipment the day/ night before the training.</i>
	Place OAE screening equipment on tables so that 2 - 4 people can share equipment.
	Reserve one OAE unit for demonstration purposes along with probe tips, calibration chambers (if needed) and other equipment elements.
Materials:	
	Place a <i>Instructional Guide</i> , Workshop Agenda, Test, and Workshop Evaluation form at each seat.
	Place screening forms, extra probe tips, sanitary wipes, toys, and zip lock bag with each piece of equipment.
	Arrange other materials to give to participants when appropriate

Information for Teachers

We will be coming to complete hearing screenings on children in your class. The following describes the hearing screening process and explains how you can facilitate this in an efficient manner.

The Hearing Screening Procedure

The procedure we will be using is called Otoacoustic Emissions or OAE Testing. This is the same procedure used in many hospitals across the country to screen newborns. It is a highly reliable hearing screening method that will help us identify a wide range of hearing health needs, including middle ear disorders (infections) or permanent hearing loss that we otherwise might not know about. These conditions can have a significant negative impact on the social, educational and developmental progress of a child when left unaddressed.

If a child does not pass the screening we will repeat it again with a two-week period. If the child still does not pass, the child will be referred to a primary care provider for initial treatment and to an audiologist for a complete evaluation when necessary. **NOTE: If a child does not pass a hearing screening, this does NOT necessarily mean they have a serious hearing health need. Rather, it means that a complete evaluation is necessary.** Any child referred to a health care provider will also need to be rescreened once the health care provider tells us the middle ear is clear and healthy. Our screening looks at the inner ear and goes beyond what most health care providers examine.

What you need to know about OAE hearing screening:

- It involves a tiny sound transmitter/microphone being placed in the child's ear from which the child will hear a clicking or musical tone.
- Does not require the child to respond to the sounds in any way, except to be quiet.
- Will be painless for the child.
- Will take about 3-5 minutes per child.
- Must be done in a relatively quiet environment, but silence is not required.
- May be done while the child is sleeping.

Teachers may facilitate the screening process by:

- Preparing the children for screening by playing a little game in which the children pretend to listen to the sound of a bird or other animal coming from a small toy, or even the teacher's hand. (The game should NOT involve actually placing anything in the child's ear canal.) It is best if the teacher avoids introducing the screening activity by stating anything like, "You are going to have your hearing tested," which is likely to make children feel nervous. It is much better for teachers to **tell children that they will each have a chance to "play a listening game."** Having rewards such as stickers available after the screening can also be a good idea.
- Recommending an especially cooperative child as the first to be screened, one who can model cooperative behavior during screening for other children.
- Designating a specific area in the room where screening will take place and where something special is set up for the children that will encourage them to sit quietly.
- Occupying the children's hands and attention during the screening process, helping to hold the child, and finding ways to soothe them if they are distressed during the procedure. Having quiet toys available for the children can be very effective.

OAE Hearing Screening and Follow-up Training Workshop Agenda

8:00 – 8:15	Sign-in, breakfast snack and get settled
8:15 – 8:45	Activity 1: Get Started
8:45 – 9:30	Activity 2: Introduce OAE Hearing Screening
9:30 – 9:45	Break
9:45 – 10:15	Activity 3: Practice Hearing Screening
10:15 – 10:30	Activity 4: Introduce OAE Hearing Screening Protocol and Documentation Forms
10:30 – 12:00	Activity 5: Conduct Hearing Screenings with Children
12:00 – 12:45	Lunch
12:45 – 1:15	Activity 6: Review Equipment Care and Maintenance and Helpful Hints for Screening
1:15 – 1:45	Activity 7: Establish a Hearing Screening Data Collection and Tracking Process
1:45 – 2:00	Activity 8: Conclude the Training

Test Your Knowledge about OAE Hearing Screening

Circle the correct response.

1. How many children are born annually in the United States with permanent hearing impairment?

- a. 1 in 100
- b. 1 in 200
- c. 1 in 300
- d. 1 in 400

2. Middle ear infections, if chronic, can cause problems with language development. What percentage of preschool children experience repeated episode of middle ear infections?

- a. 10%
- b. 25%
- c. 35%
- d. 75%

3. Most children with permanent hearing loss:

- a. Have parents who are hearing impaired
- b. Have parents who do not have a hearing loss
- c. Use cochlear implants
- d. Need pressure equalization tubes

4. The otoacoustic emission is a response from which part of the ear?

- a. Eardrum
- b. Auditory nerve
- c. Cochlea
- d. Ossicles

5. Hearing screening with OAE:

- a. Involves a behavioral response from the child
- b. Is an objective test
- c. Requires the child to be awake and alert
- d. Is provided by most physicians

6. The role of the screener does not include:

- a. Re-screening following treatment for an ear infection
- b. Diagnosing hearing loss
- c. Educating parents about the importance of hearing to a young child
- d. Providing a medical referral

7. When selecting the tip size for screening is best to:

- a. Begin with the smallest available size
- b. Choose a size slightly smaller than the ear canal opening
- c. Choose a size slightly larger than the ear canal opening
- d. Begin with the largest available size

8. When screening a child for the first time you notice that he/she is congested and the result is a “refer” in both ears. Which action would be appropriate for the screener to take?

- a. Refer the child to the physician
- b. Refer the child to the audiologist for further testing
- c. Repeat the screening while holding the probe in place
- d. Repeat the screening within the next few weeks.

9. After a child refers from screening, is seen by a health care provider, and completes treatment for an ear infection, you should:

- a. Refer the child immediately to an audiologist
- b. No further action is needed
- c. Rescreen the child in 4-6 weeks
- d. Repeat the screening only if concerns arise

10. A child with an ear infection and accompanying fluid in the middle ear:

- a. Will pass the OAE screening
- b. Will not pass the OAE screening
- c. Will usually be identified easily without OAE screening
- d. Will typically not have difficulty hearing

11. If a child is uncooperative and consistently displaces the probe from the ear canal during the initial screening session, you should:

- a. Try to screen the child again during nap time
- b. Hold the probe firmly in the ear canal while screening
- c. Refer the child immediately to the audiologist
- d. Attempt to screen him/her the following year

12. If excessive noise is present during the screening:

- a. It will take longer to complete the screening
- b. The probe should be held in place
- c. A smaller probe tip should be used
- d. The equipment will increase the volume of the stimulus

Answer key:

1 - c	5 - b	9 - c
2 - c	6 - b	10 - b
3 - b	7 - c	11 - a
4 - c	8 - d	12 - a

OAE Hearing Screening Training Workshop Evaluation

1. Please rate the quality of each of the following the training components by circling the number that best describes your assessment of the component:

	High	Average	Low		Comments	
Video presentation	5	4	3	2	1	
Printed Program Screening Guide	5	4	3	2	1	
Hearing Screening and Follow-up Forms (for documenting screening results)	5	4	3	2	1	
“Hands-on” practice screening other adults	5	4	3	2	1	
“Hands-on” practice screening children	5	4	3	2	1	
“Live” presentation and discussion by the Workshop team	5	4	3	2	1	

2. Please rate the overall quality of this training workshop in preparing you to do the following:

	High	Average	Low		Comments	
Prepare screening environment	5	4	3	2	1	
Use OAE equipment to screen young children	5	4	3	2	1	
Document screening results	5	4	3	2	1	
Implement the OAE screening protocol	5	4	3	2	1	
Inform parents of screening results and “next steps” (when needed)	5	4	3	2	1	
Make referrals when needed	5	4	3	2	1	
Care for OAE screening equipment	5	4	3	2	1	
Use the training materials to train another screener in your program (when needed)	5	4	3	2	1	

3. What additional support or resources (if any) do you think you will need to successfully implement OAE screening in your program?

4. What can we do to improve the training provided to screeners/programs in the future?

Thank you for your input!

Sample Screening Log

Name	Location	Date Initial Screen	OAE 1		OAE 2		OAE 3		Next Step
			Right/Left Ear	Pass Refer Couldn't Test	Right/Left Ear	Pass Refer Couldn't Test	Right/Left Ear	Pass Refer Couldn't Test	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	
			R: L:	R: L:	R: L:	R: L:	R: L:	R: L:	

Monitoring Screening Program Quality

The goals of screening young children for hearing loss are met when children with hearing health needs are identified through efficient screening practices and when subsequent diagnoses and treatments are provided in a timely way. An important aspect of program management includes implementing a strategy for collecting and synthesizing screening data and periodically reviewing outcomes. The following criteria will help hearing screening program administrators and audiologists assess the quality of their screening activities:

- Monitor whether **screenings are being completed within a specified timeframe or at specified intervals**.
 - In educational settings, such as Head Start, it is helpful to know the expected enrollment and assess whether screeners are meeting the goal of screening all children within the required 45-day enrollment period.
 - In health care settings, monitor whether screeners are providing the hearing screening during well-child visits at previously agreed upon intervals.

If screeners do not appear to be conducting the screening within the specified timeframe, or at the specified intervals, determine the reasons such as equipment availability, equipment in need of repair, more screeners need to be trained, etc.

- Monitor the **pass/refer rates** from the OAE screening. Typically, approximately 75% of children would be expected to pass during an initial OAE screening session. (Screeners may make several attempts during a given screening session to adjust probe fit, keep the child quiet and distracted during the screening, etc.) Refer rates may be somewhat higher during the period of time when new screeners are gaining proficiency; the refer rate may also fluctuate due to increased numbers of children having otitis media during specific seasons. However, if refer rates peak and remain high, determine whether screeners need further training related to probe fit or child management skills, whether equipment is functioning properly, etc. Conversely, if pass rates are too high, screeners may not be screening both ears, or may not be documenting outcomes accurately. For programs in educational settings using a 2-step OAE screening protocol, approximately 8% of all children screened would be expected to need middle ear assessment from a health care provider.
- Evaluate whether children needing an **OAE rescreen** are receiving it in a timely way and whether children not passing the rescreen are being seen promptly by a health care provider.
- Consider the **length of time required to conduct an OAE screening session**. Typically, the average time needed during a screening session to establish rapport with the child, conduct the OAE screening, and record the results would be less than 5 minutes per child. Extended screening sessions may indicate that screeners need help with child management skills or that they are making an excessive number of screening attempt to achieve a passing result. Conversely, if screeners have a high refer rate and report low testing time, they may be giving up too quickly

- Check to be sure that children who are seen by a health care provider are **rescreened after medical clearance**. It is extremely important that an OAE rescreen be conducted after any outer or middle ear issues have been resolved. Although many health care providers have equipment which helps them assess middle ear status, very few health care providers have the capacity to conduct an OAE screen which screens cochlear functioning. It is critical that children are rescreened and that the small number who do not pass receive prompt evaluation from a pediatric audiologist.
- Calculate the number of children who are **“lost to follow-up”** and do not ultimately receive the additional screening or evaluation they need. If a significant number of children are not receiving follow-up, take steps to improve the tracking and referral process. Remember that children not passing the screening are at high risk for having a hearing health condition or even permanent hearing loss.

Grant Proposal Template

Updating Early Childhood Hearing Screening Practices

The following is a request for funding to the <INSERT FOUNDATION NAME FOUNDATION> prepared by <INSERT PROGRAM NAME> with assistance from <INSERT NAME OF COLLABORATING ENTITY THAT WILL BE PROVIDING AUDIOLOGICAL SUPERVISION AND SUPPORT TO YOUR PROGRAM, SUCH AS YOUR STATE EHDI PROGRAM, ECHO TEAM, OR NCHAM>. The purpose of this request is to fund the purchase of otocoustic emissions (OAE) hearing screening equipment that will enable all children, birth to three <or FIVE> years of age served by the <INSERT PROGRAM NAME > to receive high quality, up-to-date hearing screenings to ensure that each child's hearing health and related developmental needs are met. This funding will significantly increase the capacity of the (PROGRAM NAME) to conduct reliable hearing screenings that will benefit <#> children in year ahead and more than <#> children over the next five years. <INSERT ANY ADDITIONAL OUTCOMES SUCH AS INTERAGENCY COLLABORATIONS THAT WILL BENEFIT>

The < INSERT NAME OF PROGRAM>

The <INSERT PROGRAM NAME > is a program that serves <number> of children birth to three <or FIVE> years of age in <center or home based> settings. As a licensed 501c3, non-profit organization, in operation since <DATE>, the <INSERT PROGRAM NAME > has provided services to more than <NUMBER> children and families: <INSERT SERVICES/PROGRAMS>. The <INSERT PROGRAM NAME> is an essential organization addressing the needs of economically challenged families and their children in the <INSERT GEOGRAPHIC> area and regularly collaborates with a variety of agencies and programs serving children and families in the community including: <LIST PROGRAMS LIKE EARLY INTERVENTION PROGRAMS, WIC, etc.>

All children attending <INSERT PROGRAM NAME > receive a comprehensive array of health and educational services designed to produce outcomes in children's development

(including health, resiliency, social competence, and language). Recognizing the strong relationship between hearing, language acquisition, cognitive development, social competence, and literacy, Head Start performance standards require that all children be screened for hearing loss and referred for diagnosis and intervention when needed. For the past <INSERT NUMBER> years, the <INSERT PROGRAM NAME> has had to rely on <INSERT SCREENING METHODOLOGY SUCH AS STARTLE TESTS AND PARENT QUESTIONNAIRES> as the primary hearing screening method for children birth to three. However, advances in technology now make it feasible to conduct reliable, physiologic screening of infants and young children using Otoacoustic Emissions (OAE) technology. OAE screening does not rely on any type of behavioral response and is considered to be the most objective, physiologic screening tool available to identify children with a wide range of children's hearing health needs, including those with unidentified ear infections and permanent sensorineural losses.

The American Academy of Pediatrics, the American Speech-Language-Hearing Association and the American Academy of Audiology all consider OAE screening to be the most reliable tool available to screen the hearing of young children birth to three years of age. To assess the feasibility of employing OAE hearing screening technology in Head Start programs, the National Center for Hearing Assessment and Management (NCHAM) has been engaged in a large research project including more than 70 programs across three states. Data collected from these programs indicated that with proper training and audiological supervision, Head Start programs were able to use OAE technology very effectively to screen the hearing of young children enrolled in their programs. The marked advantages of OAE screening over subjective methods, along with the proven feasibility of implementation, make it critical that <INSERT PROGRAM NAME> replace previous screening methods with up-to-date OAE technology. **The purpose of this funding request is to update the <INSERT PROGRAM NAME> hearing screening practices by implementing and maintaining OAE hearing screening as the standard screening practice with all children birth to three <or FIVE> years of age.** This initiative will be undertaken with

appropriate assistance and guidance from < INSERT NAME OF COLLABORATING ENTITY THAT WILL BE PROVIDING AUDIOLOGICAL SUPERVISION AND SUPPORT TO YOUR PROGRAM, SUCH AS YOUR STATE ELDI PROGRAM, ECHO TEAM, OR NCHAM>. (INSERT AS MUCH ADDITIONAL BACKGROUND INFORMATION, PROVIDED IN LATER SECTION OF THIS DOCUMENT, AS NEEDED TO JUSTIFY YOUR REQUEST/).

Proposed Outcomes

As a part of meeting Head Start requirements, <INSERT PROGRAM NAME > has been screening children for hearing loss within the first 45 days of enrollment in the program. However, the hearing screening has been done using subjective methods which can no longer be considered adequately reliable. With the proposed funding, <INSERT PROGRAM NAME > will be able to update hearing screening practices, using OAE technology, and following the screening and follow-up protocol recommended by the National Center for Hearing Assessment and Management. All children will receive the benefit of reliable hearing screening at least <insert INTERVAL>, while children who are at risk for chronic hearing health conditions will be screened more frequently. This proposed update in screening methods represents a significant change for the <INSERT PROGRAM NAME> and will enable children with hearing health needs to be identified who would not have been recognized using previous screening methods.

During the year <INSERT DATE> to <INSERT DATE> it is anticipated <# > of children will receive OAE screenings. This funding will not only contribute to services in the year ahead, but will enable the <INSERT PROGRAM NAME > to screen more than <#> of children over the next five years to ensure that those needing medical and audiologic services are identified and referred in a timely way to meet their hearing health needs.

Equipment Specifications

OAE equipment is available from several manufacturers. The price of one OAE unit is approximately <INSERT CURRENT PRICE>. Additionally, the equipment requires the use of disposable probe tips of different sizes that must be matched with the size of a given child's ear in order

to perform the screening successfully. The small plastic probe covers inserted into the ear canal during screening must be discarded after use and cost approximately <INSERT PRICE>. <ADD ANY OTHER ITEMS FOR WHICH FUNDING IS REQUESTED SUCH AS ANNUAL CALIBRATION COSTS, TRAINING, SERVICE/EXTENDED WARANTEES , ETC.>

Funding Request:

<CONTACT MANUFACTURERS FOR CURRENT PRICES>

1 OAE Unit	<>
300 probe tips	<>
Total	<>

Supplementary Background Information

Note: Some proposals may require only the above information. If more background and justification is needed, include supplementary information provided below. This background information may be integrated as part of the proposal text or included as an appendix or attachment to your grant proposal to support your request for funding.

1. Incidence and implications of hearing loss. Hearing loss is the most common birth defect. Approximately one of out every 300 children, or 33 babies each day, are born with a hearing loss in the United States (White, 1996). In addition, late-onset hearing loss caused by illness or injury can affect a child at any time. One of the most common early childhood health problems, chronic middle ear infection, can cause fluctuating hearing loss that may also disrupt a child's language acquisition if left undiagnosed and untreated. It is estimated that approximately 50% of preschool children will have at least one episode of middle ear infections by one year of age. Between one and three years of age 35% will have had repeated episodes (American Speech Hearing Association, 2003). It is further estimated that 83 out of every 1000 children in the US have what is termed an educationally significant hearing loss (US Public Health Service, 1990).

The repercussions of unidentified hearing loss are significant. As noted by the United States Department of Health and Human Services (1990):

If hearing impaired children are not identified early, it is difficult, if not impossible, for many of them to acquire the fundamental language, social, and cognitive skills that provide the foundation for later schooling and success in society. When early identification and intervention occurs, hearing impaired children make dramatic progress, are more successful in school, and become more productive members of society. The earlier intervention and habilitation begin, the more dramatic the benefits.

The link between infant hearing loss and language/literacy deficits has been well documented for decades (Mauk & Behrens, 1993). A number of independent studies have documented the negative effects that hearing loss can have on children's academic achievement. The American Speech Language Association (2003) summarizes these effects as follows:

- Children with hearing loss have difficulty with all areas of academic achievement, especially reading and mathematical concepts.
- Children with mild to moderate hearing losses, on the average, achieve 1-4 grade levels lower than their peers with normal hearing, unless appropriate management occurs.
- Children with severe to profound hearing loss usually achieve skills no higher than the third or fourth grade level, unless appropriate educational intervention occurs early.
- The gap in academic achievement between children with normal hearing and those with hearing loss usually widens as they progress through school (Allen, 1986).

2. Advances in early hearing detection and intervention. Over the past decade, dramatic improvements in hearing screening technology have significantly lowered the age at which children with hearing loss can be identified. Although auditory brainstem response (ABR) hearing testing equipment had been used in the late 1980s to screen some babies in neonatal intensive care units considered to be at greater risk for hearing loss, this equipment was costly to purchase and use and also required that infants be asleep or sedated during testing. Universal, physiologic screening of all infants and young children was therefore impractical. By the early 1990s however, a new technology called otoacoustic emissions (OAE) screening had been introduced in the U.S. and was starting to gain acceptance among audiologists as a potentially effective hearing screening tool (White, 1996).

Figure 1. Photo of child being screened using OAE technology



To understand the basic concept behind OAE screening, remember that the ear is comprised of the outer ear, the middle ear chamber containing three small bones or “ossicles” and the inner ear, or “cochlea.” During OAE screening, the screener places a small probe, fitted with an extremely sensitive microphone, in the child's ear canal (see Figure 1).

The probe delivers a quiet tone or clicking sound into the ear canal. In a healthy ear, sound is transmitted through the middle ear to the inner ear where the cochlea responds by producing an emission similar to an “echo”. This emission is then picked up by the microphone, analyzed by the screening unit, and a “pass” or “refer” result is displayed on the unit's computer screen.

Every normal, healthy inner ear produces an emission that can be recorded in this way with the total screening process taking approximately five minutes per child. If a child has a structural problem in the middle ear that interferes with hearing, if excess fluid is present in the middle ear (often due to ear infection), or if the cochlea itself is not responding to sound, the ear will not pass the screening. Thus, OAE screening can help identify children who have fluctuating losses associated with ear infection as well as children who have permanent hearing loss associated with physical abnormalities of the middle or inner ear. It is important to emphasize that OAE screening is not synonymous with audiological assessment. OAE screening can be conducted by non-audiologists and is simply the first step in identifying

children who may be at risk for hearing loss. As with any type of hearing screening, children who do not pass the OAE screening should be referred for appropriate medical and audiological diagnosis and treatment. **The value of OAE screening is that it can be conducted on children as young as a few hours old, as well as on toddlers and young children, since it does not rely on a behavioral response. The result is that children with hearing health needs can be identified years earlier than in the past.**

3. Implications for continuous screening in Head Start programs. The documented effectiveness of OAE hearing screening in hospital-based newborn screening programs (Maxon, et al., 1997), coupled with the development of an array of state resources to serve infants and young children identified with hearing loss, now makes it both feasible and imperative that early childhood programs update their continuous hearing screening practices. In doing so, Head Start grantees can ensure that any child enrolled receives timely assessment of a hearing loss and that every child identified with a loss has access to intervention critical for developing language and literacy skills.

Providing high-quality, continuous, hearing screening throughout early childhood is vital because:

- Permanent hearing loss may occur at any time in a child's life and many young children suffer from otitis media (ear infection), which, unidentified and untreated, can result in temporary hearing loss during critical language-learning years. This, in turn, affects a child's language, cognitive, and social development.
- Not all children are initially screened for hearing loss at birth. Approximately 15% of children in the U.S. born at home or in hospitals where hearing screening is not occurring, along with majority of children born outside the U.S. who are served in Migrant Head Start programs, were not screened at birth for hearing loss.
- A significant percentage of those who are being screened are still not receiving the diagnostic and intervention services they need. For example, hospital-based hearing screening programs report that significant numbers of children not passing the newborn hearing screening are not returning to receive the needed diagnostic assessment. State EHDI programs report that as many as half of the infants who did not pass the newborn hearing screening may become lost to follow-up before diagnosis and intervention can occur.
- Most health care providers and clinics cannot adequately screen for hearing loss as part of a well-child checkup. Traditional tools only allow a health care provider to view the

child's tympanic membrane (eardrum) using an otoscope or check for the presence of middle ear fluid using a tympanometer. Thus, when attempting to screen a child for hearing loss, most primary care providers are also forced to fall back on less effective observational techniques (bell-ringing, hand-clapping, etc.)

Although introduced initially as a hearing screening device for newborns, OAE technology lends itself to screening children of any age because it is:

- Painless for the child and does not require a behavioral response;
- Reliable, efficient (taking about five minutes per child) and inexpensive;
- Hand-held and portable, thus can be used in either center or home-based settings;
- Simple to administer when a child initially enters a Head Start program, at annual intervals, and at any other time that a parent voices concerns about their child's hearing or educators have cause to question the child's hearing health;
- Straightforward to use and does not require technical skill or in-depth understanding of the auditory system. With the proper training, protocol, and audiological oversight, screening can be performed by anyone who is skilled in working with children.

The dramatic improvements in hearing screening technology hold important implications for updating Head Start hearing screening practices. First, the technology has improved to the point where grantees no longer need to rely exclusively on less reliable behavioral observations (hand clapping, bell ringing or parent questionnaires) to screen 0 – 3 year-old children. Second, OAE screening can be performed on children at any age. The fact that it does not require a behavioral response makes it especially valuable for screening older children who have language or cognitive delays or are not fluent in the language spoken by program staff and therefore may not respond reliably to typical audiometry screening. Third, Head Start Health Coordinators, and other staff who are skilled in working with children can easily be trained to use OAE screening equipment. Finally, training in the appropriate use of OAE screening and follow-up for children birth to three years of age is now available to Head Start programs.

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