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NCHAM-Introduction to evidence-based hearing screening and evaluation practices for children ages 0-5

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~~Live Captioner standing by...

>> Terry, what do you say we get started?

>> I think we're ready.

>> Okay. Do you want to join me on the screen, Terry? There we go. Welcome everybody to today's webinar entitled introduction to evidence-based hearing screening and evaluation practices for children ages birth to five years of age. I'm Wil Eiserman and next to me here is Terry Foust, who is a pediatric audiologist and speech-language pathologist who is joining us today. A few logistics before we launch here. This webinar is being recorded. If anything disrupts your full attention or participation in today's webinar, know that you can access this in the next couple of days at infanthearing.org. You'll see that also in the chat. If you need to access this later, that's how you can do it. Keep that in mind too if there are any individuals who aren't present with us live today whom you think might benefit from the material that we're covering today. Once we've wrapped up our comments, we'll invite you to use the Q&A field to ask us questions or share a comment to which you would like our response.

But we are not going to attempt to have an ongoing chat or

questions throughout our presentation today. We have people from all over the country, over 2,000 people registered for today's webinar and we're delighted about that. So as I said, my name is Wil Eiserman and I'm the director of the early childhood early outreach initiative, also known as the EC ho -- hearing assessment and management at Utah State University, that's known as NCHAM. This is letter soup here. And NCHAM serves as the Early Hearing Detection and Intervention National Technical Resource Center that's funded through a cooperative agreement with the Maternal and Child Health Bureau. Starting in 2001 for about 20 years, the ECH O -- with a focus on supporting early Head Start and Head Start programs in implementing evidence-based hearing screening and follow-up practices. We're delighted to continue to make our resources and other learning opportunities available to staff from Head Start programs and Part C programs as well as from anyone from any early care and education setting who can put this to use. I want to give a quick shout out to our captioner today for your talents and services. That's Bobbie McGraw, who we appreciate. We never want to overlook the fact that that's an actual person who is providing us with that captioning service. You can activate that through the live transcript option that you see on your screen if that's helpful to you. So I think I'm going to turn my video off so you can just focus solely on the content that we have here, but you've seen me and you see Terry. There we are in better form. We have worked together for a long time in providing training and technical assistance to early Head Start programs. Terry, why don't you say a little bit more about that.

>> Terry: Yeah, thank you. As William mentioned, William and I, along with other ECHO team staff, as well as a lot of local collaborators have provided training in nearly every state with really literally thousands of staff from early Head Start, Head Start, American Indian, Alaska Native and migrant Head Start and other early care and education programs over the years. We're always encouraged, as we are today, just looking at the number of you that have joined and have expressed interest by that huge amount of interest that there is in establishing evidence-based hearing screening programs so that the children with hearing-related needs can be identified and then served.

>> The work of the ECHO initiative is based on the recognition that each day young children who are Deaf or hard of hearing are being served in early childhood education and

healthcare settings often without their hearing-related needs being known. Hearing loss is often thought of and talked about as an invisible condition. So the question is: How can we reliably identify which children have normal hearing and which may not?

>> Well, the short answer to that question is early care and education providers like yourselves can be trained to conduct evidence-based hearing screening just like you're seeing depicted in the pictures on your screen. Now, the ultimate outcome of a hearing screening program is that we identify children who are Deaf/Hard-of-Hearing who have not been identified previously. So the procedure that you see on the left is called otoacoustic emissions or OAE hearing screening. That's the recommended method for children birth to three years of age. It's also recommended for three to five years of age as well. As you see on the right side of your screen, that's the procedure that some of you may be familiar with called Pure Tone audiometry hearing think screening. That's the most common for three years of age and older. You'll see that in many early care and education providers using it. We'll be talking about both of these methods today.

>> So this is William again. Let me give you a quick overview of what we want to cover today. While this presentation is not a training, our goal is to provide an overview of the big picture of what is involved in implementing evidence-based hearing screening for children across the age spectrum birth to five years of age. And we are going to start by giving you an overview of the auditory system or hearing system which will help lay a foundation for understanding how the hearing screening methods we'll be talking about today actually work.

Then we are going to talk about why we screen for hearing loss. What even makes it possible for us to be seriously engaged in systematic screening for hearing of young children? We're then going to talk about the two methods that Terry just mentioned, OAE and Pure Tone audiometry, starting with the overview of the OAE screening process followed by the overview of the -- next we'll address the important question: What do we do next when a child doesn't pass a screening? We'll summarize the follow-up steps that are undertaken when a child doesn't pass a hearing screening on one or both ears. And then we are going to wrap up by showing you how to access resources to support the process of developing and maintaining your hearing screening program and address questions that you might have. So that's where we're headed. You

can follow along our progression through these topics by referring to the left side of your screen. Since this is a recorded webinar, the left side of your screen serves as a menu that you could advance forward during your video if there are particular areas you want to go back to or to review again. Before we launch into our content today, I want to make sure you all know where to go after today's webinar to get additional resources, information, and access to training, because I know a lot of you have been asking us about where you can access training. You'll hear us say this several times today. implementing evidence-based hearing screening practices is more than just using a designated piece of equipment or a specific method. To implement evidence-based practices, that equipment or method must be used according to a prescribed set of steps under carefully controlled conditions, each step of which is carefully documented in detail. This is true whether you're using OAE screening or the Pure Tone audiometry screening. Over the years the ECHO initiative developed a wide range of resources that are free to you to help you achieve the goal of implementing evidence-based hearing screening. Our goal for today is primarily to help you find all of that information and the resources that you need. Let's, right off the bat, help you see where this is. Let's take a quick look at our website. This is kidshearing.org. We invite you to feel free to use all the implementation tools that you'll see here, which include things like letters to parents about your screening efforts, referral letters, forms for documenting results. Our goal feels to create all of the things that you might need in implementing a screening program so that you wouldn't have to make all of those things yourself.

Many of the resources you'll find here on our website are the result of various examples, early childhood programs shared with us. Some of them may have even come originally from the programs that you work in. So you can be assured that others have used the language and the format of many of these resources to achieve the same goals that you have. So let me give you a quick look at these resources and then after the webinar we encourage you to take some time to go really look at this.

This is our landing page at kidshearing.org, which gives you first an introductory look. The first part of the page is really very general, but where it says in the header there, early care and education providers training and implementation resources, that's where you'll want to scroll down and have a look at everything

that's there. The first group of resources are related to planning. We don't usually encourage people to start the development of a screening program with training. We instead encourage programs to think about some of the questions that you'll find in these resources about getting ready. That has to do with finding a local audiologist to help partner with you if at all possible, how to select and purchase equipment, and other programmatic things you want to have in place before you would think about actually having a training.

Once you've completed those practice exercises, those practice steps, I should say, you would then want to look at accessing training. We have some links here to online training courses in both OAE and Pure Tone audiometry training screening. Know that you can come back to the access training. These are online curriculum that you can get into at any time you need it, which works nicely for staff who might be turning over and new or on an annual basis to refresh everybody.

The next group of resources are really designed for once you get going with screening. They include some checklists for getting ready for a particular screening day. They include all the letters and referral forms that you might need. They include documentation forms, a guide for talking to parents about screening outcomes, and a variety of other things that are very practical that we've used over 20 years now with various programs.

Knowing that you're not just screening one child but screening groups of children that you need to monitor in their follow-up process, under follow-up resources you'll find a really useful tracking tool as well as some documents to help you monitor the quality of your screening program.

So after we're done today, we hope you'll go back to this website and get acquainted with these resources so that you can start moving forward in your process, wherever you're at at this point. If you're planning, you'll find resources for that. If you're ready to have some training, you'll find those resources, et cetera. So again, kidshearing.org. If you don't remember anything else after today, that's the thing to remember. Let's put all of those resources into context and we are going to start off with our first topic about the auditory system or the hearing system. There are three main parts to the auditory system: The outer ear, the middle ear, and the inner ear or cochlea.

>> Now, while this is how the auditory system -- .

>> Hold on, Terry.

>> Yeah?

>> When the sound enters the outer ear, it causes the eardrum to vibrate. And that movement stimulates tiny sensitive hair cells in the snail-shaped portion of the inner ear called the cochlea. From the inner ear, the sound signal is carried along special nerves to the hearing centers of the brain and the individual experiences the sensation that we call sound. All right, Terry.

>> Terry: Thank you. I was rushing ahead. I appreciate that. Thank you for that explanation, William. So I want to emphasize that while this is how the auditory system typically functions, there can be some exceptions. So let's talk about those. There can be some temporary issues like a wax blockage or fluid in the middle ear that's caused by ear infections that we may discover and get addressed during a hearing screening or the hearing screening process, but the primary target condition of hearing screening is the functioning of the inner ear or the cochlea, which is that snail-shaped portion of the ear you see here on your screen.

Now, in some instances, the sound will travel through the outer and the middle ear, as you see here, but when it reaches that cochlea, that snail-shaped portion, the signal is not transmitted to the brain, resulting in what we call a sensorineural hearing loss. This condition is permanent. This is the primary condition we're screening for in our mass screening efforts. This may come as a surprise to you but it's an important fact for you to know, that sensorineural hearing loss is actually the most common birth defect in the United States. In fact, about three in every 1000 babies are born with a hearing loss, they're Deaf/Hard-of-Hearing. Most newborns in the U.S. are now screened for hearing loss using evidence-based methods most before even leaving the hospital. But screening in that newborn period isn't enough. Research suggests that the incidence of permanent hearing loss actually doubles between birth and school age, so from that three children in 1000 at birth to about six in 1000 by the time children enter school. We can't only screen for hearing loss at birth. We need to screen throughout early childhood because a hearing loss can occur at any time as a result of illness, physical trauma, or environmental or genetic factors. This is often referred to as late onset hearing loss, just meaning that it's acquired after the newborn period.

>> William: So it's commonly understood that language

development is at the heart of cognitive and social emotional development and school readiness. This drives many of the practices we see in early childhood settings. And think about how often there's an emphasis placed on early language development, counting the words children can produce, and celebrating those things. It's also important to note that hearing health is at the heart of typical language development and that if we are going to be conscientious about promoting language development as a perfect our commitment to school readiness, we must be equally conscientious about monitoring the status of hearing throughout this period. If hearing is compromised, then typical language development will ultimately be compromised as well. And we don't want to wait for a language delay to manifest to then discover that the child has a hearing loss.

>> Terry: This is exactly why we see so much emphasis being placed on monitoring the status of hearing in young children. So programs like Head Start, which for years have served as models of comprehensive health and education programs for young children and their families, they have required hearing screenings for all of their children even before we had the excellent methods that we now have to do this. But what actually is screening? So screening can be thought of as kind of a sorting process. It helps us to separate the children who are at risk of having a condition from those who are far less likely to have the condition.

Those in that first at risk group are then followed with additional steps implemented by pediatric audiologists and healthcare providers that continue to refine that sorting process until we definitively can identify that small group of children that actually have a hearing loss. To just be up front or blunt, we screen because we simply can't provide a full comprehensive audiological evaluation on each and every child.

So screening followed by appropriate audiological assessment and early intervention, it can dramatically improve options and outcomes for children who are Deaf/Hard-of-Hearing. When a hearing loss is identified early, then we can make sure that that child has access to language. And then as a result, children who are Deaf/Hard-of-Hearing are really thriving in ways that used to be rare. So by providing a hearing screening, you then can be part of creating these really amazing life changing outcomes. So we want to take a minute here and take a look at several examples

of children with severe to profound hearing loss who have had the benefits of early identification and real quality intervention. As you'll see, these children are learning and they're thriving and they're communicating.

>> William: Thanks, Terry. In this first example, these two children have profound hearing loss. They both are assisted with a bilateral hearing aids, meaning hearing aids in both ears, which you can't really see in this video. Let's take a quick look and listen to how they're communicating with one another.

>>

(Video playing).

>> William: It sure is great to see how clearly those children are able to communicate with one another even though they have a profound hearing loss, each of them. Now, in this next example the family elected to use sign language as the mode of communication for these children who are Deaf. But they are also having success in communicating due to their early identification of their hearing loss.

(Video playing).

>> William: And in this next example, these children -- well, we'll have them tell you what makes them unique.

(Video playing).

>> William: So those children really help us remind us of our goal. We want to help make all children have access to language one way or another, regardless of whether they have a hearing loss. And the way to achieve this is to be fully committed to quality periodic hearing screening.

>> Terry: As we mentioned just a moment ago, OAE and Pure Tone audiometry are the recommended methods we are going to talk about today. And the availability of OAE and Pure Tone screening means that it's just no longer appropriate to rely solely on subjective methods that have been used in the past, methods such as ringing a bell behind the child's head or solely depending on caregivers' perceptions of a child's hearing. Don't get me wrong. Observations of a child's response to sound, especially a lack of response, is helpful and we should pay attention to how children do or do not respond to their environment. But these sorts of observations do not constitute a hearing screening because they're far too crude and unreliable and frankly we can just do so much better because of our current available technology.

>> William: In a moment here, you're going to see in the

chatbox a document, for those of you who are serving children three to five years of age and are trying to decide what method to use. So you might look for that link here in the chat here in a moment. You know, it's also important to note that although some healthcare providers have incorporated evidence-based hearing screening into well child visits, this isn't standard practice, especially for children less than four years of age.

>> Terry: Yeah, in some cases, some parents may report with a lot of certainty that their healthcare provider did perform a hearing screening, but please understand this. I really can't emphasize it enough as an audiologist, that routine examinations of ears by healthcare providers should not be mistaken as hearing screenings. It's precisely because screening isn't yet happening consistently in that context that programs like yours are adopting hearing screening practices, because obviously there's an increased recognition of the importance of monitoring hearing and it's now feasible to do this in programs like yours and really by people like you.

>> William: The take home message here is this: Unless a child's health or medical records include documentation of ear-specific hearing screening results and the screening method used, we shouldn't really ever assume a hearing screening was completed.

>> Terry: Yes. And then another important point to remember is this. While OAE and Pure Tone screening are highly reliable screening methods, there's no perfect screening method. And so that means that there may be, in some rare conditions that just simply aren't identified through these screenings. So whenever a parent expresses concern about a child's hearing or development to you, even if the child received and passed a hearing screening using one of these methods, that child should be referred for an evaluation from an audiologist.

>> William: Let me say one more thing about newborn hearing screening results. When children enter your program or system, especially during the first year of their life, always be sure to collect their newborn hearing screening result. If the result is anything but a pass on both ears, you want to make sure that the follow-up evaluations occurred. And if you don't see evidence of that, you want to help the family circle back to their healthcare provider to accomplish that.

You can proceed with your own screenings, but you'll want to

make sure they circle back with their healthcare provider. If you're in a program that requires an annual hearing screening like most Head Start programs, you can use the newborn hearing screening result for the first year of a child's life, but we would want you to rescreen after that.

So now let's talk about these two screening methods that are used during early childhood. If you're responsible for children who are under three years of age, the recommended method is OAE screening, which you see on the left here. If you're responsible for screening children three years of age or older, historically Pure Tone Audiometry has been the recommended method for this are group. This is the hand raise screening where the child raises the hand or performs some other task each time they hear a sound presented in the headphone. You see this method here on the right and you probably already yourself experienced being screened this way.

>> Terry: Just a note here, William. There's growing recognition that for a variety of reasons, as common as the Pure Tone method has been, it may not have been the most feasible method to use for some of the younger children. The reason being that for example the research has shown that 20 to 25% of children in that 3 to 5 age group can't be screened reliably with this methodology because they developmentally aren't able to follow the directions reliably. That's been our experience as well. In those instances then, OAE screening is the preferred method for these children.

>> At a minimum, if you're establishing evidence-based practices for three-to five-year olds and you're considering using Pure Tone screening, you'll also need to be equipped and prepared to do OAEs on the 20 to 25% who can't be screened with pure tones or alternatively you'll need to have a means for systematically referring all those children to the audiologists, who can perform the screening, which is often quite challenging to accomplish.

>> Yes. And maybe to simplify things, more and more audiologists are recommending the use of OAEs uniformly among all children three years of age and older. It's quicker than Pure Tone screening both in learning to do it and to actually implement. It's far more likely to be a method that will work across the board with all children in that three-to five-year age range in that group you would be screening, and it's equally effective.

>> William: If you or your program are still undecided which

method to use, primarily for the three and older group, we encourage you to take a look at a document we have on our website that compares OAE screening and Pure Tone screening. I think you see that in the chat or Q&A box. It's being posted right here in just a second. Yeah, there it goes. It's in the chat.

>> Terry: Thank you. Okay. Let's start with otoacoustic emissions or OAE screening, which as we said is the recommended hearing screening method for birth to three years of age. You see this depicted in these photos here. If you're serving children birth to three, again, OAE is the one and other evidence-based method that's recommended by the American Academy of audiology as well as the American Speech-Language-Hearing Association, which is also known as ASHA.

>> OAE screening is the most appropriate method for identifying children at risk for permanent hearing loss for a variety of reasons, because it's accurate and feasible. It doesn't require a behavioral response from the child, thus allowing us to screen children under three years of age. It's quick and easy. Most children can be screened in a minute or two. Sometimes in as little as 30 seconds per ear. It's a flexible tool, which means you can screen children in a variety of environments, including their classroom, home or healthcare settings. You see this little guy in this photo here being screened at the snack table. You can go to where children are.

>> Terry: Probably -- well, not probably. Most important of all, it's effective in identifying children who may have a mild hearing loss or loss in one ear as well as those who have severe bilateral loss. In addition, it can really be helpful in drawing attention to a broader range of hearing health conditions that may need further medical attention. OAE screening can also help to identify children who have a temporary hearing loss, that may be as a result of a middle ear infection, although this isn't the primary goal of OAE hearing screening, it's definitely an added benefit of screening with this method.

>> Take a look at these photos here. These children are all being screened using the OAE method. What do you notice here? They aren't being pulled into an environment that's foreign or strange to them. They're being screened in everyday educational or home environments where they're already happily spending their time playing or involved in something or simply being held by a

caregiver or parent. And those people that are doing the screening are people they know. Their teachers, their home visitors or health specialists at the program.

>> Terry: In fact the screening works best when children are familiar and comfortable with the adult doing the screening and where they can play with a toy, be held or even sleep while the screening is being conducted. So let's talk about conducting an OAE. To conduct an OAE screening, we're first going to take a thorough look at the outer part of the ear. We are going to make sure there's no visible signs of infection or blockage.

Then a small probe on which a disposable cover has been placed is then inserted into the ear canal. That probe delivers a low volume stimulus into the ear. A cochlea, or the inner snail-shaped portion of the ear that we've talked about before, a cochlea that's functioning normally will then respond to this sound by sending the signal to the brain while also producing an acoustic emission. This emission is analyzed by the screening unit and then approximately 30 seconds or so a result appears either as a pass or as a refer.

Every normal, healthy inner ear produces an emission that can be measured this way.

>> Let me show you a quick realtime screening of a child being screened using the OO method. This is unedited. This is a well trained screener with the help of another adult, which is really nice, and a particularly well behaved little boy. You'll see the actual screening process.

(Video playing).

>> William: That clapping indicated that they had received their result of a pass or a refer.

(Video playing).

>> William: Once again, another result. Like many skillful tasks, competent screeners may make it look easy. And it often is easy once you have been trained and have had a little practice. To assist screeners in keeping all of the different steps of the screening process in mind, among our various resources is a skilled checklist for OAE screening. It's helpful whenever you're a new screener or whether you're an experienced screener needing a refresher, or if you're a manager, it can be useful as a competency-based observation for those you're supervising.

>> Terry: Training you receive should help you to be able to acquire all of these skills.

>> William: As we've emphasized, evidence-based

screening is more than just a designated piece of equipment being put to use. You have to be trained to use that equipment and having a screening and follow-up process built around that equipment is essential, but still, equipment is essential. You should be aware that OAE equipment is available from several different companies and in models designed specifically for screening by lay individuals such as most of you who are participating here today. These are the simpler and less expensive models. Basic OAE equipment currently costs around $3,800. There are also other equipment models intended for use by audiologists for diagnostic purposes. These are more complicated and more expensive. As non-audiologists, be careful not to purchase more than you need by getting the simple or basic models. In addition to the costs of the equipment, each time you screen someone, there's a disposable cover that goes over the probe that needs to be inserted snugly into the ear canal and which come in a variety of sizes to ensure a really snug, tight fit. You'll need a good selection of those. They cost about a dollar to $1.50 each. You will want to include those in your budget. You'll need adult sized covers as well because you'll need them for the learning process as well as to test equipment on a regular basis. So you'll need some adult sized covers as well. We usually recommend that you purchase about twice as many probe covers as you have the total number of children you intend to screen. That was an overview of the on-site on screening method. Let's take a look at the Pure Tone method who may be using this for three-to five-year olds. Note this is never recommended for children under three. Pure Tone has traditionally been the most common method for children three to five years of age. You probably recognize this method either because you already use it or because you had your own hearing screened this way. In this procedure, musical note-like tones are presented to children through headphones and children respond by providing a behavioral response like raising a hand to indicate they've heard the tones. Pure Tone screening gives us a good idea of the functioning of the entire auditory system all the way to the brain with the child showing a physical or behavioral indication that they perceived the sound.

It's a relatively affordable method with the screening equipment costing between 800 and one thousand dollars. The equipment is typically durable and portable enabling us to easily transport it and use it in a variety of locations and a wide range of

individuals can be trained to perform the OAE screening procedure just like with the OAE screening procedure. Terry, tell us how the procedure works.

>> Terry: Yes, thank you. To conduct a Pure Tone screening just as we did before with OAE, we're first going to take a look at the ear again to make sure there's no visible sign of infection or blockage. If that ear appears to be normal, then the screener will instruct. So they are going to explain and tell or they condition the child how to listen for a tone and then respond by raising a hand or placing a toy in a bucket. Now, this step can take some time because we need to be sure that the child is able to reliably complete the screening task.

Once the screener's observed that the child reliably responds to sounds that are presented just as the screener instructed, then the actual screening is started. So during the screening process itself this listen and respond game is repeated at least twice at three different pitches or frequencies on each ear, noting the child's response or lack of response after each tone is presented. If the child responds appropriately and consistently to the range of tones that are presented to each ear, then the child passes the screening.

>> William: Two especially notable ways Pure Tone screening differs from OAE screening is that the process requires children not only to be cooperative but to be full participants in the process, following directions and responding reliably. As we mentioned, this means completing an initial process we refer to as conditioning or teaching the children and carefully determining whether we're getting reliable responses from them before even attempting to actually screen.

>> Terry: Yes. And then the other difference between Pure Tone and OAE screening is that the screening itself is not automated like OAE screening is. Instead, in Pure Tone screening you as the screener will manually step through the presentation of each tone multiple times for each ear and then record each response. Then following a very specific protocol, you as the screener, will determine whether the ear passed our not. With Pure Tone screening there can be considerably more potential for screener error to produce inaccurate results. So with that, there's a need for thorough training and oversight to make sure all the screeners are adhering to the prescribed screening protocol. We really can't emphasize enough the importance of training and periodic oversight even as some of the most experienced

screeners can make errors that inadvertently invalidate screenings in ways they may not be aware of.

So here is an example of the actual screening steps that need to be documented for each ear as you screen. Through the training process, you'll learn of all the steps of the conditioning and then the screening process and all of the environmental conditions that must be monitored and met as you complete a child's screening. And then based on these results, the screener determines if each ear passes or not, because as I mentioned earlier, the device itself does not produce that result as is the case with OAE screening.

>> William: As is true with the OAE method, kidshearing.org provides a set of implementation resources for Pure Tone screening as well. Similar to the screening checklist that I mentioned about OAE screening you'll find on our website, we also have a skills checklist for Pure Tone screening. The elements of those checklists serve as the basis for a thorough training process as well as for monitoring the quality of your screening practices once you're up and going. So you'll want to take a look at those when you get into looking at the resources on kidshearing.org. We've given you an overview of the two methods, regardless of which method you use, you'll eventually have a child who doesn't pass the screening. So what then? In order to be evidence-based, it's not just using that equipment, right? It's having a process that you can follow-up with when children don't pass. Our screening efforts are only as good as our ability to systematically follow-up with children who don't pass screenings on one or both ears and to do that in a proper manner.

Another key resource you'll find on our website is the follow-up protocol. I'll go over that really quickly here. We would expect these percentages here to be a little bit higher for children who are older, but these are the percentages you would see with birth to three-year olds. We screened 100% of our children and we would expect about 75% of those children will pass and will not need any further follow-up. But that leaves about 25% that will not pass on one or both ears the first time we screen and will need a second screening in about two weeks.

At that point about 8% of the total number of children we've screened will still not pass the second screening and will need to be referred to a healthcare provider to check out their middle ear to see if they have wax or fluid or ear infection. Once any middle ear

problems have been resolved and you get medical clearance that everything seems to be healthy, you'll then screen that small percentage of children a third time. We expect about 1% or even less to still not pass that third screening. Those children will be referred to a pediatric audiologist for a complete audiological evaluation. So although a small subset of children will indeed need follow-up referral and further screening, we found through literally thousands of implementations of this protocol that this protocol helps children get the medical and audiological attention they need while also minimizing unnecessary referrals to healthcare providers who both parents and healthcare providers appreciate. Once you're underway with your screening program, you can look back at these percentages and see if they're similar.

>> Terry: William, can I interject here?

>> William: Yeah.

>> Terry: This is a really great program quality check. If you find that your pass and refer percentages are significantly different than we would anticipate at any point in the protocol, you may want to seek technical assistance.

>> William: Yeah. This is just another illustration. You'll find this illustration on our website as well. It's important to point out that whenever a parent or caregiver expresses a concern about a child's hearing or language development, even if the child passed the screening, that child should be referred for an evaluation from a pediatric audiologist. This is true because, if you recall from what Terry said earlier, hearing screening methods are not 100% accurate or perfect. And so to be on the safe side, whenever there is an explicit concern about hearing or language, make a direct referral. Of course, you can screen the children and send that result along, but make the referral regardless.

So let's return to our website kidshearing.org and remind you again of where you'll find the various resources we have been talking about today. We invite you to feel free to use any of these resources, these tools, and certainly before you sit down to write a letter explaining your screening efforts or to prepare a referral letter or prepare forms for documenting results, check out what we already have here. Many programs have found that they can use these as is or with very minor adaptations. Our goal was to create all the things you would need so you wouldn't have to go to the trouble of making some of these things yourselves. Again, this is our landing page.

You'll find in the first group our planning resources. If you're needing an audiologist to help you with your program, which we always encourage. If you're looking for screening equipment information or other planning checklists, look here. If you're ready for or when you're ready for training, check out how you can access the online training opportunities whether that's for OAE or Pure Tone audiometry that you'll find right here. Those are on an as-needed basis so you can go through this as a group of staff members or if you have a new staff member just joining you, they can go through it on their own. There's a variety of ways you could use these training opportunities here. Once you're up and going, this is the group of resources where you'll find all those letters, forms, the protocol follow-up guide, and referral letters, including scripts for how to communicate and what to say to parents under different circumstances throughout the follow-up process. Lastly, this is the group of resources where you'll find our tracking tool so you can stay on top of all of the children that you're screening and follow in a timely way up on the children who haven't passed at some point along the way. If you're a Head Start program, remember that in addition to what we have here, there is the Head Start center on health, behavioral health and safety. They're also prepared to provide some support, though we're also here willing to do that as well. So you may not have ever quite thought of it like this, but monitoring the status of children's hearing is central to the quality early childhood programs that you're a part of that are committed to language development and school readiness. When children with hearing loss are identified and connected with the intervention resources they need, as you saw from our examples here, they can thrive. And you can have the satisfaction of knowing that you were part of that outcome. And that's not just the short-term outcome; it lasts a lifetime. So we have got a few minutes to open up for questions here. Let's go to our questions box. I'm going to turn on my video. And I'll see if we have any questions that we can help address.

>> William, I see one question that says: So why are doctors not doing hearing screens when there is a language delay? That's a really great question and one that we were surprised, as I mentioned in the presentation as well. Most of them just simply don't have the equipment to do so. They do a physical check of the ear but don't have the equipment. Others, and we've worked with some where we've piloted getting them equipment, but sometimes

there are some challenges in a busy practice with flow and documentation and billing of one more thing. So there are some that are successfully doing it, but the vast majority are not.

>> William: Yeah. If you're looking for an audiologist, on our website where it says "find an audiologist" there will be a couple of links to resources you can turn to. One of them is your state's Early Hearing Detection and Intervention or EHDI program. They're the program that has historically been responsible for newborn hearing screening programs. You can contact them to see if there's somebody nearby that you can either have help support the development of your program or whether you need to refer children to an audiologist, they're a good resource. There's somebody asking about what can we do if we're only seeing children virtually? Well, that's tough. There really isn't a great hearing screening method that you can do remotely. Of course, you can ask about a parent's perceptions, but as Terry highlighted early on, we don't ever want to rely on those as an actual hearing screening. You really do need to get your hands on the children to do a screening. Terry, do you see some other questions here? There's a question about the referral process and should we refer children directly to the pediatrician or to audiologists or speech-language pathologist. That's a great question and it's the reason why the training is so important. The follow-up process is critical. In the training and when you look at our protocol sources on our website, it provides you with the step by step answers to those questions based on different scenarios, how many times you've attempted to screen a child and what the results have been. So we can't go overall of those different scenarios, but the answer is in those resources. So go have a look at that.

>> Terry: William, there's a question that says what is the recommended time frame or protocol for professional calibration of both the OAE and the Pure Tone equipment. We really recommend that you budget and plan for annual calibration of that.

>> William: Yeah. There's a question here about children who have tubes in their ears. You've probably all heard about that or know more about that than some of the others, but tubes are often put in the ears of children who have chronic middle ear conditions, repeated ear infections. You should screen children who have tubes in their ears for sure. Some OAE devices require an additional adjustment to the equipment just for when you're conducting a screening of a child who has tubes in their ears. So if

you're not getting a result when you do that, that may be why. So be sure to check your equipment manual for instructions on screening an ear that has tubes in their ears and make sure that you're aware of the adaptation to the equipment. Not all equipment requires that, but some does.

>> Terry: And tubes that are open and functioning as per their purpose, we should be able to complete a screening. When mentioned if we don't get a reading at all or if you get a refer, we should still follow the protocol because perhaps those tubes are no longer functioning the way they're supposed to. There was one question here, William. Do you work with programs without Head Start?

>> Absolutely. We invite anybody who can use our resources to put them to use. All of our material resources are free to download and use. Regardless of what program you're in or if you're an individual provider, feel free to use those. The training process that we point to on our website was designed to be pretty environmentally neutral. So it should be applicable to the age group regardless of what setting you're actually working in. So thanks for asking about that. Somebody's asking about this webinar. It is being recorded and will appear on our website. Our primary NCHAM website, which is infanthearing.org. That will be available in the next couple of days. You're welcome to go back and look again or share it with some folks that maybe didn't attend live today but for whom you think may benefit. We're getting a number of specific questions like what size probe tip to use with the OAE. That's a very specific training question and it takes practice to really answer that question. But that's something that you would want to explore as part of a training and a practice process. If you have the ability to have a local audiologist work with you when you practice screening children the first time, they can really help you with that. But in general, the bigger the tip, the better, because it's going to get the tightest fit in a child's ear. So always aim for the largest tip size that you can get in a given child's ear.

Let's see, we have many questions here. Some of you are asking about getting copies of this PowerPoint. Actually, the resources that are on our website, the various videos and other resources are going to be more useful to you than having this PowerPoint, because we've pulled a lot of the content here from our different videos and print resources. So take a look at those. I think they will be what you're really looking for.

Terry, there's a question here about accuracy of OAE when you're testing a child who's asleep. Do you want to address that?

>> Yeah. Asleep is actually one of my favorite ways if I can keep them asleep and not wake them up and get the OAE, that's usually a great scenario. In fact, there are times I've ridden in a car as the parent drove around the block so we didn't wake the child up because they had fallen asleep in their carseat. So sleeping will not interfere with the OAE. Your biggest risk is maybe waking them up as you place the probe but it's a great way to screen.

>> We are back at the top of the hour already. Know that you can contact us through our website. Somebody asked me to show again our website where you can identify the different resources. You'll see planning right here. I should back up. This is kidshearing.org's landing page. As you scroll down, you'll find the planning resources under that heading. If you're looking for training, this is where you'll find those, both for OAE and Pure Tone. The actual implementation screening resources are in the next group. And the follow-up tracking tools and other program quality monitoring resources are here. So thank you to everybody. Thank you to our captioner and our back up technical support providers and to all of you who are doing so much to support children and their families. Hearing screening is not some peripheral component of early childhood programming. When you're committed to language, you're committed to receptive language also. That means staying on top of the hearing status of children, which as we demonstrated today, can change at any point without us even knowing. So by staying on top of it, you can make sure that children don't have a disruption in their access to language, which can really make a huge difference in their lives. So we hope to see you on our website and at future webinars and if there's anything that we can address via email, find the contact us button on our website and we can communicate that way. Thanks, Terry, and thanks everybody.

Oh, before you sign off, there is a link to an evaluation question and a certificate for attendance for today. That is being posted and is also going to be a direct bounce from this screen once you sign out. Gunnar, is that going to be in the Q&A box?

>> I put it in the chat a few minutes ago.

>> Oh, in the chat. So go into the chat window and you'll find the link to the questionnaire. Very simple questions about our -- for us today. And then it will generate an automatic certificate of

completion for today's webinar.

Thanks everybody.

>> Thank you.