

Introduction to Evidence-Based Hearing Screening Practices for Children Ages Birth - School-age

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Who am I? I am Will Eiserman, and I am the affiliate Associate Director at the National Center for Hearing Assessment and Management, known as NCHAM. Now, NCHAM is housed within the Institute for Disability Research, Policy and Practice, at Utah State University, which is a federally funded university center of excellence in developmental disabilities, with a critical nationwide focus. Starting back in 2001, it's a long time ago, I also served.

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As the director of the Early Childhood Hearing Outreach Initiative, that became known as the ECHO Initiative. And for over 20 years, the ECHO Initiative served as a national Technical Resource Center, on early hearing detection and intervention with a specific focus on supporting early childhood, Early Head Start, Head Start program staff, in implementing evidence-based hearing screening and follow-up practices. And we're delighted to be able to continue that work and to expand it.

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By making our resources and learning opportunities like this one, available not only to Head Start program staff, as well as to anyone in early care and education settings, birth all the way up through the school age years. Um, and so we're delighted to have you here from so many different programmatic contexts, from Early intervention programs, Head Start programs, healthcare settings, schools. The wide variety of people here with a different focus.

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On even the age groups that you're targeting. Now, I'm joined today by a couple of people. The first is Dr. Terry Foust, who is a pediatric audiologist. And a speech-language pathologist who has served as a consultant, and trainer, and a good friend of the ECHO Initiative since its very beginning. We're not hearing you, Terry. Yes. There we go. Can you hear me now? Good afternoon, everyone. I'm sorry about that. We are thrilled that you're here with us and hope that you enjoy our time together. You know, William and I, along with our ECHO team and many local collaborators and almost every state we've really worked and trained, you know, staff from Early Head Start, Head Start, American Indian, Alaskan Native and migrant Head Start programs, as well as other early care and education programs in schools throughout the years.

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And we also have with us today Mandy Jay, who is presenting. Mandy has a master's in public health, and she's a program coordinator at the National Center for Hearing Assessment and Management, or NCHAM, as William referred to us. And the best qualification is that she's the parent of two children who are deaf or hard of hearing, and we're really grateful for her joining us and bringing her multiple perspectives to this work.

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Thanks, William and Terry. I'm really glad to be here. We have approximately 1,000 people who are registered for this webinar, which is super exciting. We are always encouraged by the huge amount of interest that there is in establishing evidence-based hearing screening. So that children with hearing-related needs can be identified and served as a parent of children who are deaf, I can't begin to tell you how important it is to see all of these people who are committed to evidence-based hearing screening and follow-up practices.

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Thanks, Mandy and Terry. You know, the work of the ECHO initiative is based on the recognition that. Every day, children who are deaf or hard of hearing, are being served in various early childhood school and healthcare settings. Often, without their hearing-related needs being known. At all. Hearing loss is often... Thought of as an invisible condition or disability. So we have this question. How can we reliably identify which children have normal hearing?

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And which may not. So the short answer to that is that early care and education providers can be trained to conduct these evidence-based hearing screenings that you can see depicted in these photos. The ultimate outcome of a hearing screening program is that we can identify children who are deaf and hard of hearing, who have not been identified previously. Yeah, thank you, Mandy. That's exactly right. So while you're looking at this slide, the procedure on the left, that's called otoacoustic emissions or OAE screening. And that's the recommended method for children birth to three years of age. And it's increasingly recommended for children 3 to 5 years of age as well. Now, if you look on the right, you're going to see the procedure pure tone audiometric screening and that's historically been the most commonly used screening method for children three years, about three years of age and older. And you may feel you may still see many early care and education providers using this method. And we're going to talk about both of those methods here today

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So, let me give you a quick overview of what we want to cover today. Now. First of all, this... presentation today is not a training per se. But our goal is to provide an overview of the big picture of what is involved. In implementing evidence-based hearing screening practices for children, Across the age spectrum from birth through school age. And we're going to start off by giving you an overview of the auditory system, or the hearing system.

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Which will help lay a foundation for understanding. How the hearing screening methods that we're going to talk about today actually work. And then we're going to talk about why. Why do we screen for hearing loss? And what even makes it possible for us to be seriously engaged? in systematic screening of hearing. Then we're going to talk about those two methods that Terry just went over, otoacoustic emissions, or OAE. and pure tone audiometry, starting with an overview of the OAE screening process.

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Followed by an overview of the pure tone audiometry screening process. Next, we're going to address A really important question, and that is. What do we do next when a child doesn't pass a screening? What do we need to have our heads ready for in developing screening practices in terms of those children? And we're going to summarize the follow-up steps that are undertaken When a child doesn't pass a hearing screening on one or both ears, so you can start to think ahead about how you would implement that.

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And then we're going to wrap up by showing you how to access resources to support the process of developing and. maintaining your hearing screening program. And then have some time to address your questions that you might have. So, as we progress. If you have questions, jot them down. We may anticipate your questions and. And make it so that you don't even need to ask, but jot your questions down, and then We'll open up the floor to those questions.

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So that's where we're headed, and you can follow through our progression. Uh, through these topics by referring to the left side of your screen, and... and since this is a recorded webinar. This left side menu can be useful if you return to this webinar as a recording, and want to just navigate to the specific portions of the presentation. to review again, or to share with others. So keep that in mind. Throughout this webinar, you are going to hear us emphasize and repeat the phrase evidence-based practice a lot. That is very important to what we're talking about today. This includes three components. First, you need to use the recommended screening methods that match the child's age and developmental level.

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Second, you need to implement the follow-up that is recommended. up recommended in this sequence within the appropriate timeframe when a child does not pass one or both ears. And third, you need to document all outcomes. This is an important element that If I've been told, you know, if you don't, if you don't document it, it didn't happen, so that's what we need to remember here. Documenting all screening outcomes, gathering follow-up diagnostic information, and ensuring access to intervention services.

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is an important step. While it is understandable that people focus on recommended methods when aiming to implement evidence-based practice and clearly using the appropriate method is essential, screening is only as valuable as follow-up. So, as you consider your practices, we encourage you not only ensure you're using the appropriate methods, but also that you're reporting appropriately. How many children have you been screened? What are their pass and refer rates? How many were referred for an audiological evaluation?

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How many completed that evaluation? How many were identified with permanent hearing loss? And what supports are they receiving? That full picture, not just the initial screen, is what makes the effort meaningful. That's right, well put, Mandy. So... Let's set the stage with a quick overview of the auditory system. Terry, you're the pediatric audiologist, so why don't you walk us through this? Yeah, thank you, William. So if you take a look at this photo here, you're going to see that there are three main parts to the auditory system. We have the outer ear There are three... oh, Terry, I'm sorry, I always forget that this is a recording.

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No problem. Let's see. So, yeah, let's take a look there. Again, I saw them pop up here on the slide There are three main parts to the auditory system. The outer ear, the middle ear, And the inner ear, or cochlea. As this mother's voice reaches her child's ear, The incoming sound causes the eardrum to vibrate. Which then moves three small bones in the middle ear. This movement stimulates Thousands of tiny sensitive hair cells In the inner ear.

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From the inner ear, the sound signal is carried along special nerves, To the hearing centers of the brain, And the child experiences the sensation We call sound. So while this is how the auditory system typically functions, there can be some exceptions. And those exceptions can include such things as a temporary issue like a wax blockage that's in the ear canal Or there can be fluid, like you see circled here in the middle ear, which is, can be caused by ear infections and congestion.

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But the primary target of the hearing screening, of our hearing screening, is the functioning of that inner ear, or the cochlea, that snail-shaped portion of the ear. So in some instances, that sound will travel through the outer ear, the middle ear, but when it reaches that inner ear, the cochlea, the signal isn't appropriately transmitted to the brain. And that results in what we call a sensorineural hearing loss. And this, a sensorineural hearing loss, this is the primary condition that we're screening for in our mass screening efforts.

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So we need to screen throughout childhood because hearing loss can occur at any time and it can occur as a result of these things of illness, physical trauma or environmental or genetic factors. And these things are commonly referred to as late onset hearing loss, and that just simply means that it's acquired after the newborn period You know, it's commonly understood that language development is at the heart of cognitive and social-emotional development.

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And academic achievement. that recognition drives many of the practices we see in educational settings. Think about how much emphasis is always placed on early language development. Counting the words that children can produce, etc. and. Our emphasis on language continues across all of the years. It's also important to note That hearing health. is at the heart of typical language development. And that if we're going to be conscientious about promoting language.

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As a part of our commitment to educational achievement, It just makes sense that we would be equally conscientious about monitoring the status. of hearing throughout childhood. Because if hearing is compromised. Well, then typical language development will ultimately be compromised as well. And we don't want to wait for a language delay to manifest, or Other concerns to arise Only then to discover that the child has a hearing loss.

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But without hearing screening, that can, in fact, happen. And that can happen because permanent hearing loss. As we've said, is often a sort of invisible condition. Now, most, it's the most common birth defect in the United States. Sensorineural hearing loss, affects about 3 in 1,000 children At birth. And the prevalence actually doubles. By the time children enter school, to about 6 in 1,000. And then it increases steeply to about 50 in 1,000.

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During the school-age years. So, we want to point out that While hearing loss may be invisible, We cannot afford for these children. To be invisible. They need to be seen, and identify, so that they can thrive. And so, that is a really important set of numbers for you to keep in mind. As you promote the work that you're... launching around doing hearing screening, with children. Now, hearing loss, is often called the invisible disability.

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Why? Because it isn't easy to see. Children can mask it remarkably well. When permanent hearing loss is identified during the school years. It usually isn't severe or profound loss at that point. They would likely... those cases would likely have been noticed earlier. More often, though, it's the mild or moderate hearing losses that, people haven't picked up on yet. Children with mild or moderate losses frequently rely on visual cues. They may turn toward a sound.

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Because they saw someone else turn toward that sound. They may copy peers. They may appear attentive even when they didn't fully hear, or understand what was said. So hearing loss, Can stay invisible to us. They may not appear on our radar until they begin falling behind. And even then, Without appropriate screening and follow-up. Those children are at risk for being misidentified as maybe having, A learning disability or a behavioral concern.

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Maybe a mental health need or. We've even seen children being considered as being on the autism spectrum. When in fact, there was a hearing component. We saw this early in the ECHO initiative. Many children identified with Late onset permanent hearing loss. We're already receiving speech therapy. Yet no one had evaluated their hearing. And unfortunately, We continue to see that very pattern. And it should go without saying that all the speech therapy in the world won't be very effective.

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If an underlying hearing loss remains unidentified. We don't want to wait until hearing loss becomes visible. That's why high-quality screening and follow-up matter. Especially for children receiving special education services. Too often, You, the ones of you who are on today, are the only ones Who are in a position to ensure that that... that those children get screened. And identified. Yeah, exactly. Thank you, William. That's an important point. Now, let's take a minute here and ensure that we're all on the same page about what a screening actually is. So we want you to think of screening as sort of a sorting process. It's one that helps us separate Children who are at risk of having a condition from those that are far less likely to have the condition. So those in that first high-risk group are then followed with additional steps implemented by a

pediatric audiologist and healthcare providers

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To continue to refine that sorting process until we can definitively identify that small group of children that actually do have a hearing loss. And I guess, you know, to be blunt, we screen because we simply can't provide a full diagnostic evaluation on each and every child. Screening, when it's followed by appropriate audiological assessment and early intervention, can dramatically improve options and outcomes for children who are deaf or hard of hearing.

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Keep in mind that hearing, like vision, can be impaired along a broad spectrum of severity. And even a mild hearing loss can have very real consequences on a child's learning and socialization. When hearing loss is identified early, we can make sure a child has access to language. And this is true across the whole age spectrum. Given improvements in technology that have dramatically improved our ability to identify hearing loss in children, starting on the day they are born, as a result, improvement in hearing loss identification. Yep.

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are thriving, children are thriving in ways that they haven't before. William, I think you've got it queued up where we can see several examples of children with severe to profound hearing loss who had the benefit of early identification. And now our learning, thriving, and communicating. Yes, let's go there. So these two girls have significant hearing loss and they both have hearing aids. And, um, listen to how they communicate.

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with each other as they play with their dolls. Now, in this next example, these two boys, have, uh... are deaf, and they use sign language as their mode of communication. Um, so they've also accessed language just in another way. Yeah. Now, in this next example, these two boys, well, they're going to tell you their own story, I'll let them... Hey, I... So those kids are among the many who are thriving. And, you know, they are the ones we want to always keep in mind.

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Um, as we embark on hearing screen. Now, Mandy, you have your own story. Tell us a little bit about the role that hearing screening played in the life of you and your kids. Sure. Um, I love those videos. I never get tired of seeing them. Um, I love seeing those children thrive. Um, I... first of all, my children would... might be offended by us referring to them as children, since they are 26 and 21 now. They both passed their newborn hearing screening. We had no family history of deafness or hearing loss in our family, but by the time my oldest daughter was almost three, I was suspicious that something was going on. I knew she was strong-willed, I knew she had the ability to ignore me, but it felt like there was something else. And at that age, she was screened, and they determined she had a mild to moderate hearing loss.

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So since we were looking for that. It was looked for with the subsequent children and my second daughter also passed newborn hearing screening. By the time she was about one, her audiologist. Well, I joke that I would take the older one to an audiology appointment and then scoot the baby carriage over to the audiologist and say, now check this one. And so when she was about one, she got her own chart is how we say. And she also had mild to moderate hearing loss. Because the girls were.

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Were screened, followed up on, um, again, past that past newborn hearing screening, um, they were. We're given early intervention services that made all the difference in the world. They are phenomenal. I want to talk about one of the... when you're talking about the invisible disability, my oldest daughter fooled a lot of people because she's an excellent lip reader. She could lip read from across the room. And so when I said, I think she has, I think she can't hear everything, people thought I was crazy. So After we finally got her diagnosed, then again, they got the services that they needed. We did lots of...

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Speech language therapy, lots of work, lots of repeating myself over and over again. Mommy is turning the light on, mommy's turning the light off. So those services are really important, and it made a big difference in their lives. gone on to go to college, the second daughter is started PT school just last week, so they are thriving, successful, communicating. And it would not have happened if they had not been screened. In my case, it was because I made the initiative to have them screened.

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I'm glad you guys are on this call so that you can help make that initiative for some other child like mine. Well, and Mandy, you know, one of the things that I think is so important about stories and stories like yours is that Your children passed a previous screening. And that, to me, underscores why it is so important. That we continue to screen across the age spectrum. Because hearing status, just like vision, can change at any time.

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And, you know, just like vision can get a little blurry. Our auditory experience can get a little fuzzy. And when it does, We don't realize it, we're not hearing everything the way everybody else is. So, your story is, you know, really underscores the importance of that. So, those children, and Mandy's story, remind us of our goal that We want to make sure that all children have full access to language one way or the other, Regardless of whether they have a hearing loss.

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And no matter how significant it may be, And the way we achieve that is by being fully committed. to quality periodic hearing screening and follow-up. Yeah, exactly. Thank you, William. Now, as we mentioned a moment ago, OAE and pure tone audiometry are the recommended methods that we're going to be talking about today. And I just want to say here that the availability of these two methods of OAE and pure tone screening That means that it's no longer appropriate to rely solely on subjective methods that have been used in the past.

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These are things such as the use of sound makers or caregiver perceptions of a child's hearing. Now, don't get me wrong, observations of a child's response to sound, especially a lack of response, just like Mandy told in her story Is helpful, and we need to pay attention to how children do or do not respond to their environment. But these sorts of observations, they don't constitute a hearing screening, because they're just simply far too crude and unreliable And really, we can just do so much better than that because of our currently available, our current available technology.

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And because also, a lot of times, The parents report will be that they don't think there's a problem. When, in fact, there may be. It's also important to note that although some healthcare providers. have incorporated evidence-based hearing screening into well child visits. This really isn't standard practice, not yet anyway. Especially for children less than 4 years of age. Yeah, exactly. In fact, this is really an important point because some parents are going to report with a lot of certainty that their healthcare provider did perform a hearing screening.

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But what we really need to understand is this, and I can't emphasize it enough as an audiologist, routine examinations of ears by healthcare providers, so looking in those ears or doing other types of observations Should not be mistaken as a hearing screening. It's actually because screening is not yet happening, you know, consistently in these contexts. that the screenings that you're doing and the follow-up that you're doing are so important So, the take-home message here is this.

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Unless a child's health or medical records include documentation, of ear-specific hearing screening results. And the method used. We should never assume a hearing screening was completed. And certainly not assume that the child passed. Yeah, exactly. Now, there's one other important point to remember, and that's this. There is no perfect screening tool. So while OAE and pure tone are highly reliable screening methods, they're not perfect. And so that means that there could be some rare conditions that are not identified through these screenings. So whenever a parent expresses concern about a child's hearing or their language development Just as Mandy described for herself, even if the child is received and passed a hearing screening using one of these methods, we still want to refer that child for an evaluation from an audiologist.

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Okay, so let's talk about these two screening methods now that are used during childhood. Under the age of 3. It's a very simple recommendation. There's 1 method recommended, and that is the OAE screening otoacoustic emissions which you see here on the left. Now, if you're responsible for screening children 3 years of age or older, historically pure tone audiometry, which you see on the right has been considered the recommended method for this age group. This is that headset screening where the child raises a hand or.

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Performs another task. Each time they hear a sound that's presented into the earphone. Yeah, you see that method right there on the right? But I want to just say that just mention that there is growing recognition that for a variety of reasons That the pure tone method may not always be the most feasible method to use with

some children, especially children in that 3 to 5, age range. Because the research has shown that 20 to 25% of the children in that 3 to 5, year age group. They can't be screened with this methodology because they just aren't developmentally able to follow the directions reliably. So pure tone can also be difficult to complete with children that have certain developmental delays or differences.

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Even children with the language that's different from that of the screener. So in those instances when pure tone audiometry can't be completed, then OAE is the preferred method. So at a minimum. What we're saying is that if you're establishing an evidence-based hearing, screening practice for 3 to 5 year olds, or older. And if you're intending to use pure tone screening. You'll also want to be equipped and prepared, trained to do OAEs on the children who can't be screened that way.

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Or alternatively, you need to have some kind of a way to systematically refer all of those children that you couldn't screen to audiologists who could perform the screening and frankly referring that many children to audiologists could be quite a challenge to actually accomplish. Yeah. And you know, really, to simplify things more and more of us, as audiologists are recommending the use of OAEs uniformly across children, 3 years of age and older, and we're doing that because it's quicker than pure tone, both to learn to do and to implement.

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But it's far more likely to be a method that'll work across the board with children in the younger and the older age groups. So in the those in with. So with children, 3 to 5 in these older age groups, your screening will be just as effective with OAE. So if you or your school or program are currently undecided about what method to use primarily for children 3 years of age or older. We want to encourage you to take a look at a document that we have on our webs.

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kidshearing.org that compares OAE and pure tone screening for this older population. I'll show you where it is here in a minute when we look at our website. But take a look at that. I do want to chime in on the importance of checking with your State and local regulations. Some States require pure tone audiometry to be used at least once before OAE is used with these older children. That is due in part because many of these regulations were developed before the OAE technology was widely available. So make sure and check what your regulations are in your specific state.

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Excellent point, Mandy. Thank you for interjecting that. Yeah, thank you. many of those regulations just need updating. okay. So now let's take a look at the methods and let's start with otoacoustic emissions or OAE screening. And that's what you see depicted here in these phot. Now, again, OAE is the only evidence-based method recommended by the American Academy of Audiology, as well as the American speech, language, and hearing, association for children, birth to 3 years of age, and of course, any older children that cannot be screened with the pure tone meth.

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So OAE screening is the most appropriate method to identify young children at risk for permanent hearing loss, 1st because it's accurate and Whoops. What did I do? I think it just jumped ahead, didn't it? What happened? Oh, I see what I did. I'm sorry, everybody hold on. Hold on. There you go. Alright, it's accurate, and it's feasible. It doesn't require a behavioral response from the child. Or which means we can screen children really quite young under 3 years of age.

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It's quick and easy. Most children can be screened in just a minute or 2 sometimes, once you've been trained and have a little experience in as little as 30 seconds per ear. It's flexible. That means we can go into a variety environment of environments like you see here going to where children already are in their classroom, in their. Or healthcare settings. And most important of all, it's effective. it's effective in identifying children who may have a mild hearing loss or a hearing loss in just one ear, as well as those that have severe bilateral hearing, loss or hearing loss in both ears.

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In addition, it really can be helpful in drawing attention to a broader range of hearing health conditions. It may need further medical attention. So OAE screening can also help identify children who have , a temporary hearing loss as the result of middle, ear infection. And although this isn't the primary goal of OAE hearing screening, it's definitely an added benefit of screening with this method. So take a good look at these these pictures for a second. These children you see here, are all being screened with the OAE method. What do you notice about where they are?

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They aren't being pulled out into some foreign environment that's strange to the kids. They're actually being screened in their everyday educational or home environments, often where the children are already happily spending their time. Those who are doing the screenings are often people. They already know their teachers, home visitors, a health specialists. They're just sliding in alongside what they're already doing and incorporating the OAE screening.

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Into that activity that is one of the beauties of OAE screening. In fact, the screening really works best when children are familiar, and they're comfortable not only with their environment, but also with the adult that's doing the screening. And it's you know, where they can play with a toy, they can be held or even sleep, while the screening's being conducted. Hey, Terry, did you say sleep. Absolutely one of my favorite strategies, especially when, when a mom will call and say they fell asleep on the way in, and, I've jumped in the car, and we just go around the block and screen them.

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Or you could just sit in the parking lot as well. So, Terry, walk us through how this OAE screening procedure works. How is it that we can screen children while they're sleeping, or before they're old enough to raise their hand. How does this work. Yeah. So let's let's walk through this here. So to conduct an OAE screening, we're going to 1st take a thorough look at the outer part of the ear. We want to make sure that there's no visible sign of infection or blockage.

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After we've done that, we're gonna, we're gonna take a small probe on what we're where we've placed a small, disposable probe cover, and we're gonna then insert that into the ear canal. And that probe's going to develop or, excuse me, that probe's going to deliver a low-volume sound into the ear. Now the cochlea, or that inner ear, which is that snail-shaped portion that you see here on your screen. So an inner ear that's functioning normally.

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It's going to respond to this sound by sending the signal to the brain, while also producing an acoustic emission. And it's this emission that is analyzed by the screening unit. And in approximately 30 seconds or so, the result's gonna appear, it's gonna appear as either a pass. Or a refer. Okay. So you heard, Terry, right? There is actually a sound that's gonna come back out of the ear that the probe in the ear is going to measure. That's a pretty amazing discovery of about 30 years ago, which is how we're able to do all of this.

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Yeah, exactly. The ear actually generates that byproduct, and we measure it. And every normal, healthy, inner ear produces an emission that can be recorded in this way. So let's take a look at an actual real-time screening of this little guy. Under pretty ideal circumstances. He's certainly comfortable with the people in this situation. You're going to see the woman on the right. She's got a probe in her hand. She's going to insert in that child's ear.

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And then she's gonna push a start button on a device that you'll see her raise into the view. After we get going. Are you ready? Like. So the probe is in the ear. She's let go of it. She's pushed the button. And that means they got a result. Let's try that one. There it is. So we don't know if the child passed or not. They're always going to respond in reinforcing his cooperation, but they got their results. You should be aware that OAE equipment, which you see here is available from several different companies and in models designed specifically for screening by people like yourself, lay individuals.

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That, most of you are in fact and these are simpler and less expensive models. but OAE equipment currently costs around. Terry, check in with me. What are we? What are we seeing for current costs? They're just. They're still just barely under 4,000. It's about 3,900. Okay. Alright. Great. And. Well, not but that's just the fact. You know, and to follow up on that point. William, you know we want these basic models, but there's other equipment options or models that are intended for use by audiologists like myself, and they're.

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Designed for diagnostic purposes, so they are more complicated. They do more things and they're more expensive. You don't want those expensive or complicated models. So as non-audiologists, be sure to not purchase more than you need by getting simpler models. And I want to just say that. They're gonna look the same. It's internal modules that make one a basic screener versus one that has more diagnostic components, so they're going to look the same. So don't base your decision like, Oh, I'm getting the basic screener by how the screening unit looks.

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you're actually gonna need to be purchasing the modules that are put into the same-looking unit. Where you've bought a car lately, you'll know it can look like the same car on the outside, but you can pay a lot more for different extra features that are under the hood. Yeah, but yeah, think of it as trim lines. But you want the basic. Yeah, in addition to the cost of the equipment itself. Each time you screen a child, there's this disposable cover that has to go over the probe and put into the ear. You'll need a good selection of those.

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And they are disposable and. Fortunately they cost between a dollar to \$1 50 cents each. Since you won't always select the perfect size each time we recommend you. Purchase maybe, twice as many probe covers as you have children to screen, especially at first. And you're. Also going to need some adult probe covers as well, because you're going to use those during your learning process. when you you practice on each other. But then you're also going to need some on a regular basis, because you're going to test the equipment on your own ears. So that you can make sure that it's functioning properly before screening. So you're going to need some adult probes as well.

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So when you or one of your fellow coworkers meets with. Say, an equipment distributor or salesperson. That salesperson may mention that they'll be able to offer you training. And it's really important that you understand that this training. Is really. Rarely sufficient to meet the actual training needs that you have. Yeah, yeah. And kind of to go back to your car's analogy when you meet. Excuse me. The training offered by the salesperson is intended to acquaint you with all the various functions of the equipment, but they're not going to train you in how to screen young children.

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You know, under all of the varying conditions that we'll be screening under. They're not going to teach you how to document your results, communicate with parents or what the follow-up protocol should be when a child doesn't pass. And so this has been a point of confusion for people. So we just want to make it really clear. That they'll train you with the functions and the components, but not with the rest of it. Yeah. So like Terry alluded to, you know, think of it as like the car salesperson who may train you on all the cool functions of the car, probably more than you need to know about and that can be and is helpful. But they're not going to teach you how to drive.

[00:46:29]

They're not going to teach you how to parallel Park for sure. And it's the same when purchasing, hearing, screening equipment. You'll need another way to learn actually how to screen. And as we'll point out, one way is to access online courses that we happen to have available through our website. They're available on an on-demand basis, and we'll show you in a little bit about where to find that. But know that you're really one way or the other, with an experienced screener or audiologist, one way or the other, you want to be trained, and don't attempt to teach yourself this.

[00:47:08]

Yeah, exactly. And those resources that William talked about that we're going to show you in a moment. You'll have those. And if you can, also having a local audiologist, who can then screen alongside you, help you when you're just getting started and give you helpful pointers is really a great way to get the training that you need. And this is really true, whether you need training for OAE screening or the other method we're going to talk about which is pure tone, audiometry.

[00:47:37]

Yeah. And so one of the things you'll find on our website are some of the sources for purchasing OAE equipment. We try to keep this updated as best as we can. So you can always go there 1st and see what you find there and contact the manufacturer distributors from there. And you'll find that on our website. So. Let's shift gears. We've talked about OAE screening, which is, if you remember, the only method recommended for birth to 3, and increasingly used for 3 to 5 on. Up. So now let's talk about pure tone. Audiometry, screening.

[00:48:20]

No, 1st of all, that this method is never recommended for children under age 3. And as we mentioned it, it has traditionally been the most common method used for children, 3 to 5 and older. So you probably recognize the method either because you already use it, or because you've had your own hearing screen this way. In this procedure. Musical, note-like tones are presented to children through headphones, and the children provide a behavioral response like raising a hand to indicate that they've heard the tones.

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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 us, with a physical or behavioral indication that they perceive the sound. It's a relatively affordable method with the screening equipment costing. Where are we now, Terry? With those costs around a hundred bucks or. Oh, Nope. We're closer to a thousand. I didn't mean a hundred 1,000. Yes.

[00:49:30]

I was, we're yeah that that never was. The equipment is durable and portable, enabling us, just like with the OAEs to easily transport them and use in a variety of locations. And a wide range of individuals just like you, and just like with the OAEs, can be trained to perform the procedure, the puretone audiometry screening procedure. Now let's talk about Pure tone screening in a little more detail. just like OAE screening to conduct a pure tone screening. We're gonna take a look at the ear, just like we would with the other method. We're gonna take a look at that ear.

[00:50:13]

Thoroughly. We want to make sure that there's no visible signs of infection or blockage. And if the air is normal. Then, you, as the screener will instruct or condition the child in how to listen, how to listen for a tone and then respond by raising a hand. Or putting a toy in a bucket. Now this step can take a little bit of time, so that we're sure that the child is reliably able to complete the screening task. Once the screener's. Observe that the child reliably responds to sounds that are presented just like you've instructed. That's when the actual screening is started.

[00:50:52]

Now, during the actual screening process, this listen and respond game, we're going to repeat at least 3. Excuse me at least twice at 3 different pitches on each ear, and then we're going to note the child's response or their lack of response after each of those tones is presented. And if the child responds appropriately and consistently to the range of tones that we're presenting, that's when the child passes the screening. You know, there are a couple of really important and notable ways. That pure tone screening differs from OAE screening and.

[00:51:29]

And that is that the process of pure tone screening requires children not only to be cooperative. But to be full participants in the process following directions and responding reliably. As we mentioned, that means completing an initial process that we've referred to as conditioning or teaching children and carefully determining as the screener whether you're getting reliable responses from them. Before even attempting to actually screen them.

[00:52:07]

Yes, and then The other difference that we see between pure tone and OAE screening is that the screening itself is not automated like OAE, is so instead, pure tone screening in pure tone, screening you as the screener, you need to manually step through the presentation of each tone. Multiple times for each error, recording the response and then following a very specific protocol and past criteria, then you, as the screener will determine whether that year is passed or not. With pure tone screening, you can see that there's considerable more potential for screener error.

[00:52:44]

to produce inaccurate results. And so that you know, you can see we really have a need for thorough training and oversight to make sure that all of the screeners are adhering to the prescribed screening protocol. And you know, one of the reasons why people really are reluctant to give up pure tone screening is because you are able to see that the child is perceiving the sound, and they're react. I mean, it's we're looking all the way to the brain they're getting it, which OAE doesn't do that.

[00:53:16]

But. Terry. What's the what's the the argument against that logic? Yeah, but what we are getting is an objective response with OAE that doesn't require a response that can be interpreted. And so it's an objective physiological response, that is, either present or absent. Yeah. So like, with all kinds of screening, there are different trade-offs. So, Terry, what are we seeing here. Yeah, now take a look at this on your screen, because this is an example of the actual screening steps that need to be documented for each areas, you screen them. So through the training process, you're going to learn all of the steps of conditioning and the screening process.

[00:54:05]

All of the environmental conditions that we need to monitor and meet as we complete the child's screening. And then, based on these results, the screener will then determine if each ear passes or not. Again, the device itself is not going to produce the result, as is the case with OAE screening. So you're gonna have to manually step through every time you see an arrow show up here. That was an actual, manually guided step by the

screener to get to that result.

[00:54:40]

And to move forward. Every one of those check marks constitutes an action of the screener. Right, Terry. Yep. Absolutely. So that can. That's why, you know, people who are screening a lot of children using pure tones when they see OAEs they're like, OAEs are a lot easier, especially for older children. Can we use those? And so it always comes back to, you know, seriously, look at the considerations of both. And that's what this document is here. To really evaluate whether OAEs or pure tone are appropriate for the setting and.

[00:55:27]

Children that you're screening. These are the considerations we want you to be thinking through. In addition to making sure you've checked out your state regulations and getting involved in sharing these considerations with those, if there are already in place barriers to the possibility of using OAEs. With a broader population of children. you know, There are studies underway looking at the 2 methods, head-to-head. And one of our colleagues and friends, Dr. Dylan Chan at the University of California. San Francisco is looking right now at the equivalence of pure tone screening and OAEs. And it's kind of He says, it's kind of like comparing an electric car versus a gas car. There are definitely user-related and situation dependent cases where you might choose one method over the other.

[00:56:32]

But both have demonstrated clear evidence that they will get you safely from point A to B. So this is very much a vibrant discussion going on in the field right now. So we've given you an overview of 2 different methods for screening. Let's talk about when or if maybe definitely, when not, if you find yourself unable to screen a given child. It is very critical not to put off screening that child for a later date. If you've tried everything, children who are unable to be screened should be referred to an audiologist to complete the screening. In fact, a child.

[00:57:19]

But frequently a child who is difficult to screen may be the one that needs to be identified. So always refer a child who is unable to be screened that a gap in that process can be a difference in communication. And learning for that child, and how best to provide interventions. Let me just interject something here, you know, as we we've had the amazing opportunity of being with so many people like yourselves and programs all over the country and schools, healthcare settings. And you know.

[00:57:56]

I think. There are a couple of common. Discomforts I'll say we've had with what sometimes happens. And one is the conclusion that the outcome for a child screening can be either a pass or a referral or a cant test. And we don't really ever want to see that being what gets documented for any child, that if you have a child that you can't test. Get that child as somebody who can test them and get either a passer or a referral. And that's usually going to be with an audiologist. I mean, you can try other screeners first, st you know your friend down the hall may be. Just. Have a better rapport with this particular child than we always encourage you trying a few of those steps first But never just saying, Well, we'll try again next year, because, as Mandy

said, those may be the very children that we're wanting to identify.

[00:59:03]

So I interrupted you, Mandy. That's okay. That's okay. well, back to what we've we've stressed from the beginning. If you want your protocol to be evidence-based. Your screening process has to include a follow-up protocol, for when the children don't pass. That's right. our screening efforts are only as good as our ability to systematically follow up children who don't pass the screening on one or both ears if you yeah, if you don't, if you can't screen or you don't, if you do nothing with the results. It's not helpful to the child.

[00:59:41]

Yeah. So let me give you a quick walkthrough of the of the protocol, and then you can take a look at it more closely on our website after the webinar. And this is something that we go into a lot of detail in in the actual training that if you decide to use the one that we have available. The percentages that we have here come from one of our cohorts of over 10,000 children, birth to 3 years of age for whom OAE screening was used. But this protocol is the same protocol, whether it's for OAEs or pure tone.

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but the stats just keep in mind are more conservative because they're on that younger population. So let's look at the protocol, we start off with screening 100% of a group of children in a given cohort. And we expect right off the bat that about 75% of those children are going to pass on both ears and will not need any further follow-up. So that leaves what 25%. That will not have passed on one or both years, the 1st time they were screened, and they're going to need something as the next step, and we recommend what they need. 1st is a second screening.

[01:01:06]

Only about 8% of the total number of children screened will not pass that second screening. These children will need to be referred to a , a healthcare provider for a middle, ear evaluation. So once any middle, ear problems have been resolved and medical clearance has been given, then you're going to screen that small number of children. A 3rd time. Right. Timber. What? What happens here, Terry? Yeah, that's what I'm just gonna say is that we expect less than 1%. Now, less than 1% of the total number of children screened will not pass this 3rd screening? And those are the children that are going to be referred to a pediatric audiologist for a complete audiological evaluation.

[01:02:00]

Yeah. So you know, in some large. Programs. Often in school programs, you'll screen all, you'll see a cohort of children. Let's say you're going to screen all the 1st graders. And you'll have that group of x number 25% that didn't pass. And sometimes what happens? There is just a letter gets sent home to the parents. I've never seen that work very well in getting those children actually referred on. And so, really looking at this protocol to say, How do we make sure that children aren't just being screened and never followed up.

[01:02:45]

So. This is something we focus a lot on in the training is how to make sure that follow-up happens. So this is another way of looking at that screening process. And that follow-up process. And the one thing I want to

just point out here is, if you look at the bottom part there where it says. The process is complete. When either the child has passed on both ears or has been to an audiologist. And so I think one of the most common mistakes that we can make with a hearing screening program is to feel like.

[01:03:25]

We're done just because we've completed the 1st screening. And that is not a complete screening process. We're done when a given child is done when they've either passed or they've been all the way to an audiologist. So across many attempts, they need to have pass. On. Both ears. So. As you go through more training. That's something that you really want to 0 in on and make sure that in your screening efforts. You're really able to say we've screened this many children. This many referred this many.

[01:04:08]

We're screened again. This many were referred for middle year evaluation. This. Many were re-screened again and didn't pass. And this many went to an audiologist. And ultimately this is how many were identified. Without being able to answer those data points, you have an incomplete screening process. Yeah, exactly. William. There is one important exception to this protocol that we'd point out. And that's something we alluded to just a little bit earlier, and that's when a parent or a caregiver expresses concern about a child's hearing or language development.

[01:04:47]

We need to refer that child to an evaluation from a pediatric audiologist, even if they've passed the hearing screening. And this is true. Because if you recall what we've said earlier hearing, screening methods aren't 100% perfect or accurate, so to be on the safe side when there's an explicit concern about hearing or language, make a direct referral And of course you can, and probably ought to still screen the child and send those results along.

[01:05:15]

But make the referral regardless when there's a concern about hearing or language development that has been raised. And that includes your own concern. You may have encountered parents who aren't concerned even reporting that the healthcare provider wasn't concerned, but you were the one that sat with the child and saw that they didn't pass. Their hearing screenings. Multiple times. You know, or maybe they did pass one. Finally, but you're still concerned.

[01:05:50]

Make the referral be on the safe side. So. Before we open up for questions, which we'll do here in just a moment. Our website is kidshearing.org. And if there's anything we want you to remember out of today is this our website, because all the information we've covered there, including a recording of this webinar, can be found there@kidshearing.org. And let me just take you a quick look at what you'll find on our landing page.

[01:06:24]

This is where you'll land. And the 1st group of resources are planning resources. This includes getting the big picture that under that big, picture resources is where you'll find the comparison of OAEs and pure tone,

and the discussion that you. Want to have about that. If you're thinking about OAEs for older children, if you're wanting to find local audiologists to support your efforts or to refer children to. Under that second bullet, you'll find a dropdown of some resources to find local audiologists.

[01:07:00]

If you're looking for information about screening equipment, how to select screening equipment, you'll find that there in the next group of resources. This is where you'll find access to the online training that we have available both for OAEs and pure tones. As Terry mentioned earlier, probably the most ideal way to do training is to have a standardized curriculum like we have here, and have a local experienced. audiologist or experienced screener work through the practice exercises that are in the training, and then you have the best of both worlds, hands-on but standardized training that hasn't overlooked any key points.

[01:07:51]

The next set of resources are all practical, practical for how to get ready for a screening day, letters to send out to parents or teachers about your screening activities. The Protocol guides and follow-up forms how to document your screening results in a way that reflects the protocol that you're using. Letters for sharing results, whether that's with parents or with healthcare providers or referring children to or the audiologists.

[01:08:23]

And then in the last set of resources, well, you're not just screening one child. You're screening a whole group of children, most likely. Well, how are you going to track a whole group through this multi-step process? We have a tracking tool there. That is an excel sheet that you're. You know, able to just freely download and use. And it follows the protocol steps and automatically tells you who's done, who's not done, and what their next step is. So take a look at that, and consider using that.

[01:08:56]

as well as other resources you find there. So that's kidshearing.org. So remember, these kids. We're gonna open up to questions now. Well, these are the kids right? Mandy. As a public health expert, Mandy as a parent of a child of children who are now adults who are deaf or hard of hearing. We know the importance of hearing, screening played in your kid's lives. Absolutely, and for those of you on the call. You may not have ever thought of it quite like this, but monitoring the status of a child's hearing is central to quality early childhood programs. It's central to educational processes across all of the school years.

[01:09:44]

And to all of us who are committed to the child's success. We need to keep that in mind when children with hearing loss are identified and connected with intervention resources. They need, they can thrive just like these kiddos that we watch the videos on earlier, and just like my daughters. But it often depends on someone just like you, someone along the way who identifies their hearing loss and helps lead them to interventions that they may need.

[01:10:15]

So you can have the satisfaction of knowing that you were a part of the outcome that literally changes the life of a child forever. Thank you. Mandy. Okay, so we've got some questions here. Thanks everybody for

hanging with us. And just as a reminder, 2 things, this has been recorded. So if you want to share this with anybody or review it again, go to kidshearing.org. The next couple of days. Then you'll find this there, along with all of our other resources, and in just a moment, we're going to put up a link to a short couple. Question. Evaluation of how well we did today.

[01:11:05]

That will also generate a certificate of attendance for being a part of today's webinar. If you'd like to have that documented. So, Terry, this 1st question is. How can we make sure the probe attachment is well fit on the OAE? And before you answer that, I just want to make sure that everybody is clear that this webinar was an overview. It was not a training. we're happy to answer some of these questions, but know that these are really the kinds of things that you learn in a training. So, Terry, how are people able to know whether they've got that probe fit in the ear correctly? How does that work.

[01:11:54]

So to be clear on the question. There's 2 things here. One is the probe attachment well fit. So does that mean on the machine? So in checking your machine before a screening session, all the parts should be snug, they should not be loose. And the probe is all that from the cord to where you put a cover on should all be tight in one piece. Then the little cover that you put on the probe needs to slide all the way onto the probe to the base and then when you insert it into the ear canal, it needs to be.

[01:12:32]

a firm fit, and so that it stays self-seated when you let go And that's how you know you've got a good probe fit. Thanks, Terry. So the next question: Does the OAE fulfill the hearing? Screening requirements for kids? Ages 4 to 21 during well child visits. Sorry, Mandy. I I wasn't sure if you're gonna jump in there or not. But , it it is a objective screening method. That should be just should be just fine. But, as mentioned, you'd want to check with any State regulations.

[01:13:16]

And is that? There's a second question there as a restated. Do you see that, Terry about care gap requirement? Is OAE. Fulfill the hearing screen and care gap requirement for Medicare annual wellness exams. It does not. That has to do more with older populations in the way age-related hearing loss or presbycusis occurs. And so OAE screening would not be appropriate. for Medicare annual wellness exams. I'm glad somebody pointed out that when you type in kidshearing.org comma, the address lines switches over to infanthearing.org. We're all a part of the same, but the Early childhood portion of infanthearing.org. Can you can go to directly by typing in kidshearing.org.

[01:14:12]

And thank you for the thank yous and the positive feedback. Mandy, here's a question as a parent of a child with a hearing impairment. Can you recommend any websites that teach American sign language? And then she goes on to explain why she's asking that question. Sure. thanks for asking I. On the infanthearing.org website. There is an option to sign up for the curriculum called, sign it, but that is for littles, so probably, that bursts the 3 populations. So, not knowing how old this child is. I'll give that as an option as a resource that's free.

[01:14:56]

I would recommend maybe reaching out to your state school for the deaf. A lot of times they will offer courses for families and children, and then the American Society for Deaf Children, and also frequently I see on social media that they are. Offering classes. So. I can't speak specifically to. I haven't taken those classes, but I'm just. That's what I've seen that's out there. So here's a question, Terry. If is the follow-up protocol the same. If a child does not cooperate during the OAE, for example, getting upset or crying, or you know, what do you do next?

[01:15:40]

Yeah, thank you. That's really a great question. So the follow-up protocol, is the same. But let's let's kind of walk through that, you have a screening session, one you're not able to complete because of their fussing, crying, or upset. You've tried everything you could do. You've tried to several attempts, so we don't have a pass. So we want to repeat that if we just continue to not be able to complete the Protocol because of crying and fussing. That's actually the time that we would break from the protocol because we haven't been able to complete the screening. And we want to make a referral to someone who can. And in many cases that inability to complete the screening.

[01:16:24]

Is sufficient to refer to a pediatric audiologist to go ahead and do that. I mean, there are going to be some children, especially in that that one-year zone, one year to eighteen-month zone that can be tricky. And You may get one ear screen, but not the other one. You'll have to come back in another day, or maybe even an hour later, you can make multiple attempts. You might have somebody else. Screen so that they are starting fresh. Take, you know.

[01:17:00]

Having to go through several iterations. To get the screening done with certain children is to be expected. Let me interject there that, you know, you try several times and you just can't get it completed. Yeah, we break from the Protocol, and we can refer directly at that point. But where we want to adhere to the Protocol is when we consider it complete. And we'll won't consider. We'll follow the Protocol all the way to completeness, which is when we get those evaluation results.

[01:17:30]

So the next question is, and I'm gonna pull up a a slide here. Is the follow-up with a pediatrician sufficient after a refer result. And one of the things that will be emphasized in a training that you have. If you do. Our training, for example, is that the answer is No, that you really are consulting with the pediatrician. To find out. Is there a middle ear condition going on here? That might be explaining. At least, why weren't we weren't able to complete the OAE screening.

[01:18:12]

You know, do you see wax in there? Is there fluid? Or an infection, and you kind of eliminate that explanation, but then you always have to repeat the screening. After you are given some confidence that the middle ear is fine. It's healthy, it looks normal. That's when you want to do that. Now, if the healthcare provider, a pediatrician, does the hearing screening themselves. Then you could go with that result. But in

most cases they won't do that. You'll need to be back in gear again, so.

[01:18:53]

This is probably one of the biggest mistakes that we've seen over the years, right, Terry, that people make a referral to a healthcare provider. And whereas, with other health referrals, that is the end of the road for you as the referral source, but in this case, it isn't. It's a consultation. And the screening process needs to continue. Until you meet that criteria, that you see there that the process is complete when either you have a passing result on both ears. Or you have an audiologist result.

[01:19:35]

Anything to add there, Terry. No, I think that that's exactly right. I think you know the most common thing we've seen over the years is where, we might get something back from a physician or provider's office, and it's just checked ears, normal. Well, that means when they looked in there, things looked normal. And or, if they did, a evaluation, the middle ear, the it looks clear and normal, but hearing itself is not been screened.

[01:20:06]

Right? Right? So. If a family feels that a child hearing is normal, especially in cases of suspected autism. Or other behavioral or psychological conditions, is an OAE test sufficient or is an ABR mandatory for an accurate diagnosis. So the OAE test is sufficient. It's an objective measure of inner ear function. And actually, we might flip it if the family continued to still be concerned about their hearing, even though we had normal screening results with an OAE that might be the time that. And you remember that we've talked about that through the afternoon here, our time together.

[01:20:49]

That if those concerns persist, we'll still go ahead and refer them for a full evaluation which may or may not include ABR ABR stands for auditory Brainstem response. It comes with its own You know, factors, which also includes depending on age, but in most cases there needs to be some sort of sedation. So it carries some risks and things like that. But actually, if the family feels, the child's hearing is normal, then the O.

[01:21:21]

Test would be very appropriate. So couple final questions, and then we're gonna open up the link to the The quick survey and the certificate generator for today, is there data available about the percentage of states that require hearing screening in their early intervention programs. You know, I'm not sure I'm aware of that, but I can tell you from a Federal perspective. Any child entering part C or part b early intervention services is supposed to have a multidisciplinary evaluation that includes sensory screening, hearing, screening, being one of them that does not always happen.

[01:22:04]

But it should be. Then the next question, how frequently should we screen early head start children, particularly infants, since medical providers? don't complete screenings, but provide subjective info on each well-child visit. It would be difficult to screen children each for each well-child visit. I mean, we've pretty much advocated for annual hearing screenings. Terry, do you wanna chime in on that. Yeah, yeah, especially , you know when we take into account the information that , we shared earlier with how hearing can change,

and with the increasing incidence and doubling of that incidence as children move from.

[01:22:55]

That 0 to 3 into school. And so we've recommended annual annual screening. to be able to catch any of that. Those types of late-onset or progressive losses. So if you have any other questions, you can always contact us through our website. There's a contact. Us. Button there feel free to email us. And thank you everybody for attending. Today. We have people from all sorts of places across the country in different programs and serving different populations of children. we wish you the best of luck. And remember, you can access training through our website.

[01:23:41]

right here on kidshearing.org where it says access training, is a great way to standardize your training to refresh yourself on an annual basis, which is always a good idea. And else otherwise use the all of the other free resources that we have on our website to support your efforts. Mandy Terry. Thank you, as always, Gunnar in the background always thank you. And we wish everybody a an excellent rest of your day. Thank you.

[01:24:17]

Thank you. Everyone.