Adult Aural Rehabilitation: Indications and Assessment

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- [Jessica] It is my pleasure to introduce today's presenter. Lindsay Zombeck is a team lead for speech-language pathology and rehabilitation services at University Hospitals Cleveland Medical Center in Cleveland, Ohio, and a listening and spoken-language auditory verbal therapist. She provides evaluation and therapy services for children and adults with hearing loss, and presents on topics related to aural rehabilitation. Welcome Lindsay. We're very happy to have you on today.

- [Lindsay] Thank you very much. I'm very excited to be here today. And so we're going to be discussing adult aural rehabilitation, and today is going to be a discussion about indications for aural rehabilitation for adults, and also about assessment. This is going to be a two part series for a live presentation. It will be available next week on Thursday, and that second presentation we'll discuss therapy for aural rehabilitation, as well as goals. So today, however, we're gonna talk about indications and assessment. So for my disclosures, there is an honorarium for this presentation, and I don't have any nonfinancial disclosures. Well, I am a certified listening and spoken language auditory verbal therapist. In terms of content disclosures, I'm not going to be focusing exclusively on any specific product or service, and this course is presented by speechpathology.com.

We're going to be talking about various issues related to adult aural rehabilitation, including indications, challenges, that adults describe when they have a cochlear implant, and also skills that you can test when doing an aural rehabilitation assessment. So at first I want to just briefly discuss what is adult aural rehabilitation. It's important that we're all on the same page. This particular definition is from the American Speech-Language-Hearing Association, and I like it because it captures a lot of different information and features about aural rehabilitation, so in addition to just training specific sounds, we're going to be working on adjusting to a hearing loss to making sure somebody is making the best use of their hearing aids or cochlear

implants, whatever amplification they're using, exploring the types of assistive listening devices that might be available to help somebody, managing communication and conversations in general, and most importantly, taking charge of your communication, empowering people to be able to make the best possible listening environment and to promote their best possible communication. When we talk about adult aural rehabilitation, it's gonna be professional interactive processes, and we're working actively with the person to try to help them in a lot of different arenas. In general, we're trying to limit the negative effects of hearing loss and teach ways of compensating for a hearing loss so that somebody is able to communicate very well, to feel like they have a sense of wellbeing, and to improve quality of life. Aural rehabilitation in general has a lot of different areas.

Counseling is a major, major component in our rehabilitation. We can counsel on so many different areas with the person, with the communication partner, if they bring one with them. There is an aspect of auditory training, so training a specific listening skill. We talk about communication skills, So how to set yourself up to have the best possible communication experience. and then when things don't work as intended, how we can make the situation better and repair what had happened. We can also talk about technology, what technology is available to use with somebody's amplification, but even for a lot of people, how to use their amplification to the best of their ability and to get the most out of their amplification, how to use all the bells and whistles and accessories and everything that's available through amplification these days. And that's just a fraction of what we can do in aural rehabilitation. The cool thing about aural rehabilitation is that you can really meet the needs of a particular person, and each person's session or plan of care can look completely different from anyone else's, depending on their individual needs and what they need. So it really can be these things plus many, many more. When we're talking about aural rehabilitation and what it is, it's also important to know what it is not, and we need to remember that there are some things that are out of the scope of practice for a speech language pathologist,

and when we need to refer to either audiology or ENT, or in other professional, things that can't be fixed through just a therapy situation, so for example, things like technology and device concerns should be referred to audiology. So if somebody with a cochlear implant is reporting a shocking sensation. Regardless of type of amplification, if there's damaged equipment. If somebody reports increasing static or that the sound quality is dropping, or if you're just seeing that they're having decreased performance over time, these are all situations in which somebody should be referred back to audiology to see what's going on, and those are things that aren't probably going to be fixed with just therapy and counseling. Also consider medical considerations.

So for example, if somebody is experiencing facial nerve stimulation, you would see that it often occurs around the eye area, the side of a cochlear implant. You might see some twitching. It'll happen almost in time with the sound. So if you see facial nerve stimulation, if you look at somebody's magnet site for a cochlear implant and see any pinkness or redness around the magnet site, it often will look like a small circle, or if, depending on type of amplification, if there is any type of redness around a surgical area, those are all medical concerns that should be referred to ENT, and also mentioned to audiology.

Audiologists are great at being able to look at if there's a programming way to get around the facial nerve stimulation, and in terms of magnets, they can help with getting a different magnet size that might reduce irritation and the pinkness and redness. So when we see these types of things, we want to make sure we're referring to audiology and ENT. So as we're going to be transitioning into talking about who should get aural rehab and also about the assessment, I think it's really important to know what the evidence is. We're all in situations where we need to be providing gold-standard care, and we know we need to be providing evidence-based practice, so when we look at the evidence on whether or not aural rehabilitation is effective for adults, there's a lot of

studies out there. What you won't see in the literature is articles in which it's just stated clearly that aural rehabilitation works. Aural rehabilitation is effective for adults with cochlear implants. We don't necessarily really have those studies out in the current literature. What we do have, however, is that various target areas that fall within aural rehabilitation are effective. Aural rehabilitation is just so diverse. There's so many different things we look at, so many different things we target and work on that most of the research focuses on individual target areas, and in that situation, we have ample evidence to suggest that people can make great progress with aural rehabilitation.

The other thing to consider too is because aural rehabilitation is so diverse, not everything that we do in aural rehabilitation has been measured in the research yet. There's a lot of opportunities, if somebody is looking for a good research project. And then the other side of it is that some of the areas related to counseling can be very hard to measure. So just because we don't have a study that specifically says out aural rehabilitation works doesn't mean it's not effective. There's plenty of research to look at different specific target areas that are, so just to give you some areas that are effective and that we know from research, we know that when we're working on aural rehabilitation, it should contain both synthetic training, and there is a place for analytic training. So synthetic training is going to be practice with meaning.

We want functional practice that relates to people's worlds. We don't just want drill work. There is a place for that drill work. For example, focusing on specific sound elements. There's definitely a place for it, but in the research we're seeing that aural rehabilitation that contains more synthetic training ends up having better outcomes for people and being more effective than aural rehab that's just focused on drill work or analytic training. When we look at environmental sounds, I don't necessarily see when people have hearing aids that they have trouble identifying environmental sounds around them, but often when somebody gets a cochlear implant, they have challenges at knowing what sound they're hearing. So they're aware a sound is happening, but

they have to look around to figure out what's making the sound. But we've seen in research that with aural rehabilitation, that people are able to identify environmental sounds with 15.8 percentage points improvement on average. So that's a big change for somebody who trying to figure out the sounds around them. We've seen that sentence recognition can be positively impacted by aural rehabilitation, so speech tracking exercises helped people with sentence recognition by increasing their performance 15 to 20%. We've seen that people are able to recognize consonants and vowels better after aural rehabilitation, so on average, 20 percentage points higher than baseline when they get it formally in an aural rehabilitation program. For adults coming in, who are interested in working on articulation, and this isn't necessarily a huge percentage of our adults coming in for adult aural rehabilitation, but for those who are interested on working on articulation, that production of individual speech sounds with aural rehabilitation can increase between 12.7 percentage points to 83.3 percentage points, so people can have a vast difference after targeting articulation specifically in aural rehab.

This is something again for people who get cochlear implants. We'll talk about it a little bit more later, but music is often challenging to hear through a cochlear implant for many recipients, and we have seen that there's plenty of evidence that people can get better music appreciation when they target music appreciation specifically in aural rehabilitation. So the ability to recognize a melody, Tambour identification, tambour is gonna be the voice of an instrument. It's what allows us to determine what instrument we're hearing. The actual perception of the sound quality increases after aural rehabilitation. Pitch recognition, being able to understand lyrics in music increases, and just general reports of enjoyment of music can go up following aural rehabilitation. And again, the sound quality people reported in subjective ratings, that they went from feeling like the sound quality from music was poor, and then after training were feeling that the sound quality of music was good. In terms of identifying a specific instrument, both people who had one or two cochlear implants were able to improve how many

instruments they were able to identify by sound only after training, and then with melody recognition, so hearing a part of a song, and of an instrumental song, and being able to recognize what song it is, they were able to recognize more melodies, whether they had one implant or two cochlear implants, after specific training in an aural rehab program. We also know that people can do better talking on a telephone if they receive specific training through aural rehabilitation, so we know that through a regular telephone or cell phone, that our pitches tend to be filtered. The speech is filtered so that people who don't have hearing loss are able to hear the speaker the most clearly.

This can make it very challenging to listen through a telephone when you have a hearing loss, so people who practice listening to either unfiltered speech or filtered speech over a telephone, both were reporting that they received significant benefit from training, and did better and understood both words and sentences better on the phone after training, so there's some great evidence to suggest that working on telephone skills in aural rehabilitation can make a big difference for people with hearing loss. So there's a lot of research out there that shows that there's many different things we can work on, and proof that these areas can improve when we target them. So moving on to some indications, who do we send for aural rehabilitation?

So historically we've seen that aural rehabilitation for adults hasn't always been the first referral for adults with hearing aids or with cochlear implants. It was often people who had had their amplification for a long period of time, who were continuing to be unhappy with the outcomes, or had continued areas of concern, that would be sent for aural rehabilitation, so sometimes what I would see happening or what I was hearing from others was that somebody would get, for example, a cochlear implant, and they would not be happy at the beginning. The audiologist might make some programming changes, mapping changes, and the person would return in three months and was still unhappy, so the person would make some additional changes. And then if the person

was still unhappy would say, well, maybe you wanna go for aural rehabilitation, but by the time people were getting to, to the aural rehabilitation appointments, sometimes six months or a year, or even longer had gone on, in which they were frustrated, and there's no reason these days to wait that long. If you do have somebody who's unhappy with outcomes, then we certainly can refer for aural rehabilitation, but there's also the opportunity to send people who are just visiting audiology frequently and are needing constant reteaching, so people are coming in for audiology and don't really remember what various buttons do, or they end up in the wrong program or setting on their hearing aid or cochlear implant, and aren't hearing as well as they could be. People who are constantly having questions about how to use assistive listening devices.

People who are constantly going in for reteaching are great candidates for aural rehabilitation. When we have people who need information about their technology, or even about what assistive listening devices might they benefit from, that is another opportunity for aural rehabilitation. The practitioner can work on what types of assistive listening devices could be useful and help identify. They can also teach situations in which to use specific assistive devices, especially if somebody already has some accessories or assistive listening devices, teach them when to use them and how to use them, because it's important to remember that just because somebody owns something or even because it's physically attached to their person, doesn't necessarily mean it's on and functioning how it's supposed to be, so this is a great opportunity to work on aural rehab.

So really, I advocate for anybody who's receiving new amplification or new technology should really be considered for aural rehabilitation. So we can always look at how somebody's listening with their new technology and using their new technology, and look for opportunities to maximize their outcomes and maximize the benefit they're receiving through their technology. So when I have adults who come in, some of the

common concerns I get are listed here. I think it's important to listen to some of the concerns of adults, because these are great indicators of people who should be coming in for aural rehabilitation and who have the opportunity to benefit from aural rehabilitation. So some of the common concerns are "I hear voices, but if I can't see your lips then I don't understand what's being said." "I hear sounds, but I don't know what's making the sounds and I have to look around to see what the sounds are." "I can't hear when it's noisy." From cochlear implant recipients, I hear a lot, "Music doesn't sound the same." "I have trouble understanding on the telephone." I get a lot of, "What does this button do? What do I do with this?" You do hear some concerns from people about their job security. Like "I don't want to get fired," or some of the younger adults who are, or older adults who are in school programs, that they're worried about doing well in their classes and don't want to fail. They might not know some of their rights.

A lot of concerns about how partners talk with them. You know, "I'm trying to have a conversation, but somebody always starts the conversation from the other room, and I can't hear what they're saying, and then they get mad at me. I also hear a lot of, "I wish I could hear the minister or pastor or priest at church," or, "I'm in meetings, and I can never hear what the presenter is saying." So the reason why these common concerns are so important is these concerns can come from adults who are doing really well by audiology standards. So even our adults who are deemed successful with hearing aids or successful with cochlear implants can still have these concerns. So much of the definition of success comes from speech perception testing and threshold testing in audiology, so people can do well sometimes on those tests and still have trouble in functional environments, so this is a list of some concerns that when you hear them that's a good indicator of, "Hey, you know what? There's probably something else we can work on to make listening easier for this individual." So I've kind of grouped all of these concerns into four themes. We have a lot of concerns about comprehension and being able to understand conversation, advocacy, knowing our rights and knowing how

to make sure that we are having a level playing field at work and in school environments, technology, knowing the technology available and how to use it, and then communication, promotion, and repair, so being able to set up the best possible communication situation and then repair it if it doesn't go well. So when we get into the world of assessment, it's important to note that right now in the field, we don't really have formal standardized tests that test all of these different areas that we can look at in aural rehabilitation. So the very nature of aural rehabilitation and the fact that it's so diverse in what we cover really requires the use of additional informal assessment. So a lot of people end up piecing together information from many different sources and through interviews to make sure that we get the best possible plan of care that's going to make the biggest impact for a particular adult.

So we're going to talk about some areas that I like to assess when people come in for aural rehabilitation, We'll talk about collecting a case history that gives us appropriate information for determining a plan of care. We're going to talk about some methods of getting subjective perceptions of performance. We'll discuss auditory skills evaluation. We're going to look at some of these specialty areas of concern, such as if somebody has a concern about music appreciation, or concerns about how they're communicating on the telephone.

And then there's also gonna be some discussion about assessing somebody's technology knowledge and use. So those are some of the areas, and certainly there's other areas that might be covered, and that you might determine that, in which somebody needs additional information to be collected, but this'll just be a start of some areas for general adult aural rehabilitation. So our first area is our case history, so I really encourage you to go and look at your case history as it exists now, because a lot of times adults end up getting handed the same case history as what other speech language pathology or audiology participants receive. So looking at your case history form to determine is it asking the right questions about hearing. So many of our forms

ask great questions about swallowing, about reflux, about cognition and memory and those type of areas, but they don't always ask a lot of good, specific questions about hearing. Additionally, it's important to think about after we get collected written responses from people when we're following up and doing our interview, are you asking the right questions? Are you asking questions in which you're going to gather the types of information you need for a thorough plan of care? So this is an example of the written form that I use for collecting information when somebody comes in for aural rehabilitation. I collect a lot of information about how somebody is hearing. So how long have they had their hearing loss? Is it something that's been since birth? Is it going to be something that happened very suddenly for them, or is it something that happened over time? And if it, I want to know approximately when it started. Is this somebody who has had a hearing loss for a month, or is this somebody who has had a hearing loss for 60 years?

The type of hearing loss and the duration of the hearing loss might impact outcomes, so that's information that I want to know when I'm going into my session. I try to gather information about what types of amplification they're using. If they're using some form of hearing aid, some form of cochlear implant, and when they have that, I wanna know how often they're wearing this, this amplification. It's very, very telling if somebody is telling you that they're not wearing it very often, So that in itself indicates some problems and gives you an opportunity for some counseling, and to dig deeper, to figure out why they're not wearing it. I also like to get information on how much talking is required in somebody's daily routine. Some of our adults are going to need to talk all day long. Other adults might not really have any communication partners and might not spend a lot of time talking. Not that we don't want to help people who aren't talking as much at home, but it's important to know what type of talking. Are they gonna to be on the phone all day? Is it in person? What are their communication needs? I then ask a lot of questions about their, how they're hearing functionally, so questions such as "I have difficulty hearing sounds around me. When I hear sounds around me, I do not

know what they are." I ask questions about if they can figure out what directions sound come from, if they're able to understand what other people are saying, or whether they have to read lips. I question if they are using the phone and feeling like they can talk on the phone, whether people are able to understand when it's noisy. I question things about music, some additional audiology concerns, like are they dealing with any tinnitus or ringing in the ears, any balance issues. And then I do ask about their knowledge of technology. I always make sure to talk about what do they want to see as the outcome of their therapy?

What are their personal goals? I want to have a statement in their own words of what they're hoping to achieve and what they want to see happen. When I get to my followup questions, I will ask them about what kinds of things they're able to hear. I don't necessarily ask this for people with hearing aids as much as with cochlear implants. Sometimes this is a really good starting place for people, when they get a cochlear implant, to show them that they are hearing some things, and people tend to be very excited if they're hearing a sound that they haven't heard in a long time. It also gives me information about the types of sounds they do here, and whether or not they're able to identify the sound. I want to know if there's anything that's hard to hear.

So yeah, they're hearing sounds, yeah they're hearing communication, but people can usually identify some situation that's challenging for hearing, whether it's hearing the cashier at the grocery store, or hearing in a restaurant. It's important to find the situations that they're feeling like they're struggling in. I ask about where they need to listen during their week. So that gives good information, especially for determining later on if there's assistive listening devices that might help, or auditory skills that we need to build. If they have some form of accessory or assistive listening device, I asked them if they've used it yet and try to get some information about whether or not they feel it's working. I'll ask about if they've tried using the phone and how phone calls go. We'll talk more about specific questions for the phone later. And then I might ask about

specific situations, especially if they're not endorsing anything is challenging to hear. So for example, like if you're in a noisy place like a restaurant, how do you do? And then I make sure we spend a lot of time talking about what are their goals. What would make them feel successful with the amplification? And this is so important because adults have so many resources necessary to participate in aural rehabilitation. I mean, there's a cost factor, a time factor, often a travel factor, there's just a motivational factor. There's the whole concept of having to be open and honest and admit to your deficits with somebody, which is challenging for a lot of adults. So these are all resources that people have to use to participate in aural rehab.

We want it to be worth their while. If we understand their goals and can show them how the goals we're developing together are going to help them achieve these goals, we're more likely to have invested, motivated adults who are willing to participate in the therapy process. So when we get into testing, after we complete the case history, the first thing I like to get is a subjective personal assessment, because we know that listening in a sound booth doesn't give us the whole story. It doesn't tell us functionally how someone's doing in their everyday activities. There's many different ways that you can get somebody's personal impression of how they're functioning.

One of the most common measures out there is the Hearing Handicap Inventory for adults, and that has a series of questions that ask about certain situations, and people can indicate how frequently they experience a certain situation, and can give a good score about how somebody is functionally hearing. In my place of employment, our audiologists administer that and get that information, so I have that information on most of the adults I see, so I like to supplement that with the TELEGRAM, which I think is a little less familiar to people, but the TELEGRAM is another subjective personal assessment. You'll always see it with all the letters capitalized because each letter in TELEGRAM stands for one of the areas that's being tested. So we've got telephone, employment, legislation, entertainment, groups, recreation, alarms, and then it did,

does note who the, the members of the family are, who they're living with, if they're living alone with an adult who has hearing loss, adult with typical hearing. So I like this because it looks at things like their knowledge of legislation, and you can give them a rating from no difficulty to great difficulty, so one being no difficulty and then five being great difficulty. And then there's a series of questions you can ask to prompt each individual area, to get a little more information. So I liked that just cause I think it gives a nice, functional, big picture in a lot of different areas that we might want to work on. After I've gotten the kind of subjective measure, I generally will move on to auditory skills. So I want to see how people are listening, with their amplification, and try to determine kind of where their listening level is at, so I can develop a home program and a plan of care for the person that isn't too easy, too challenging, right at the right level. So some of the things I look at and we'll talk about in greater detail are suprasegmental features, open-set comprehension, vowel and consonant identification, as well as listening and noise.

So for our suprasegmental features, the first thing I look at is duration, intensity, and pitch. These are areas that are most likely to be troublesome for recipients of cochlear implants or people who have had longterm hearing loss who have had little or no amplification. It isn't as common that somebody with hearing aids who has heard well for most of their life has big challenges in these areas. Of those suprasegmental features, I spend the most time looking at duration, so I'm looking at the length of a sound, a word, a phrase, sentence, or paragraph. Duration is very important. Duration has a lot of implications. When we start looking at duration in all of its forms, it plays into our identification of consonants, because we know the length of a vowel sound. Following a consonant, for example, is going to be longer or shorter depending on whether it's proceeded by a voice or voiceless consonant, so it helps us with consonant identification. It also helps us to follow sentences and paragraphs when we're able to understand those units and kind of chunk information. It also provides a lot of pragmatic functions in how we use our duration and pauses and length of sounds

in conversations, so duration ends up being very, very important. Duration does not, on its own, provide comprehension, but as we apply it, once we have comprehension, then it will help us ascertain different meaning, but there's a lot of implications for our future understanding. So being able to understand length and duration is very important and important to check. it is a foundational skill, so we need to develop and make sure somebody has the ability to identify duration, because they can't really build their additional skills until that is mastered, so it is just a foundation skill, and it's one of the earliest skills we develop when we're born. It's one of the earliest skills we develop when we start listening in a different way, like through a cochlear implant, so it's a great foundational skill that if somebody doesn't have, we do want to spend the time to build.

To assess this, I personally like to use the Pre-Feature Identification Contrasts, the PREFICS, and I like this because it looks at somebody's ability to detect sound. It looks at their ability to identify something long, like the sound aah, versus something short, like ouch. It looks at somebody's ability to look at a continuous sound, like aah, versus a broken sound, ah, ah, ah. It looks at somebody's ability to identify words of varying syllable length, and does have a little bit of looking at words with the same number of syllables, so a lot of different types of duration. In addition to the PREFICS, I do like to look at phrase and sentence length.

So phrase length, generally when provided with a carrier phrase, is somebody able to pick the ending to a carrier phrase when each ending choice has a different number of syllables? So for example, if the carrier phrase is "I went," some options could be "shopping," "to the movies," or "to the football game." "On Friday," whoops, sorry, I forgot that little ending there. So each one of those have a different number of syllables. And again, you're not going to have meaning in a duration activity, so you, in theory, should be able to figure out which of those choices, "shopping," or "to the movies," based on the number of syllables, So if I said, I went, "Hmm, hmm, hmm,

hmm," you're able to pick up "to the movies," even if you didn't hear those exact sounds and comprehend it. Sentence length is going to still be closed set in this section, when we're talking about duration. Given four sentences that have different lengths, which sentence is said, and the person has to pick the sentence. If you're looking for a resource for testing this, the Cochlear Corporation Rehabilitation Manual and Screen has a section on this that I think is pretty easy to administer, and does a nice job with checking this area. I also look at open set comprehension. So I want to see, if we don't have things that are written down, are people able to still participate and comprehend what they're getting?

So no written or visual cues, can they understand the phrase or sentence? So I like to use the Common Phrases Test. In this test, a phrase is presented, auditory only, and the participant repeats the phrase that they heard. It has multiple lists, each one consisting of 10 sentences, which gives you the ability to use similar types of sentences across multiple sessions or in a test-retest situation, or as we'll talk about in a little bit, I like to do some listening and noise testing with this, and it gives me extra lists for that, so I think this is a good way to get some just basic understanding if somebody's able to understand phrases and sentences without context.

Also, in the conversation, you can see how people are doing with following your directions, following a paragraph, following the conversation, especially if you do something to interfere with their ability to read your lips. So you can get a lot of information about open-set comprehension. Another important area is vowel and consonant identification. So vowel and consonant identification really impacts somebody's ability to comprehend a specific word, and if we hear a word incorrectly, it impacts our ability to use context clues, to figure out what's being discussed. So an example, and one that I find that a lot of adults feel that they can really relate to is adults often struggle when they come into a conversation and don't necessarily know what the topic is, and they're trying to figure out quickly what people are discussing, so

they pick out one word and they say, "Oh, I heard something about the cable." So they decide to share how in their household, they just cut a cable and are now streaming, and you know, they really don't miss cable at all. And then they get this really funny look from everybody because they're completely off topic and nobody knows what they're talking about. The word hadn't been cable, maybe the word was table, and they were talking about a new table that had been purchased for somebody's dining room. When you have the wrong words, you tend to get the wrong context, and it's very hard to know what's being discussed and can lead to what many adults have reported to be very embarrassing situations and the perception that maybe they weren't really listening or that they were pragmatically inappropriate, and jumping to an unrelated topic. So it's important for people to be able to hear these differences. I like to assess this using minimal pairs testing, and I use minimal pairs, so words that are different only in one feature, to help identify patterns, to see whether somebody is hearing vowel place, vowel height, and then consonant manner, consonant voicing, and consonant place of articulation.

So oftentimes, especially when somebody has a cochlear implant, you can see that they're missing an entire target area, or they're not hearing one of these features. And then that makes an entire class of consonants or vowels that they're not necessarily hearing correctly. To test this, one of my go-tos is the minimal pairs test. In this, this is a picture from the minimal pairs test, you're given two pictures of minimal pair words, and a patient or participant is asked to tell you which word you said. The words are selected because they're very similar. I mean, they are minimal pairs, and they differ either in a vowel height, place, consonant manner, consonant voicing, and consonant place of articulation, and it's very useful, I feel, for gathering general information on patterns and, and if somebody is not hearing one of those features, so we know we can target a whole class of sounds rather than trying to target each specific sound. The final auditory skill we are going to talk about is listening in noise. We know the world is noisy. There's a lot of background noise. There's music when you go into the stores. In

meetings, there's people rustling papers, moving around. In offices, you've got computers. Sometimes the lights hum. There's tons of noises there. In situations like church or hobby groups, there's a lot of people. Sometimes the main speaker isn't close by, and in a lot of situations, such as like restaurants, you have competing speakers. You have tons of people talking. So we know it's hard for all of us in these environments, whether or not we have hearing loss, but when somebody does have hearing loss, it has a greater impact on listening and noise. Amplification alone isn't always sufficient for listening and noise, because while amplification generally does a good job of making somebody's voice louder, so you can hear them, it also tends to amplify the noise, so you don't always get the noise or sound you want amplified. So practicing listening in noise, and helping somebody determine appropriate assistive listening devices, and what environmental modifications to use can really help them. The ability to listen in noise is a predictor of conversational communication, and this is because our conversations almost never happen in truly ideal listening environments, so if somebody struggles with listening in noise, they're really going to struggle with conversational communication in real-world environments.

It's also a really good thing to examine when somebody's coming in saying that they're having trouble with conversational communication. So for listening and noise, I use the open-assess or the open-set-assessment task, that common-phrase test that I talked about earlier. I tend to use that list again, but in noise, so I have somebody repeat back a phrase or sentence that they hear that's presented auditory only, but is presented in a type of noise. So I like to test both environmental noise and competing speech noise. So environmental noise will be noises like around the room. If I am in the office and don't have access to an audiology booth, what I like to use is, there's an app that I believe is available on Apple and Android products called White Noise HD, and White Noise HD has a restaurant simulation, So it's supposed to be sounds that are soothing to people, and apparently listening to the din in restaurants is soothing for some people, so it's one of the options, so you hear like plates and glasses and silverware

and kind of the din of somebody talking. So that's a good environmental noise, and then for competing speech, that's when you have multiple speakers. I personally like to use a sound, a conversational sound file. You can get it on Karen Anderson's website. She has a website that's successforkidswithhearingloss.com. Again, that's successforkidswithhearingloss.com, and she has a test on there called the functional listening evaluation, and as part of that, she's got a sound file you can use that has competing speech noise that I think is a great quick resource, if you don't have access to another competing speech option. In terms of specialty testing, I like to check how somebody does with telephone use and with music appreciation.

The telephone use is likely to be people with hearing aids or cochlear implants, so any form of amplification. Music appreciation tends to be more adults who get cochlear implants. For telephone use, there's a lot of information that I like to assess and ask to determine how somebody is using the telephone, so one of the things I had them do is demonstrate how they make a call. I can't tell you how many times when I've had somebody, particularly with a cochlear implant, demonstrate how they make a call, that they hold the, the receiver of the phone directly to their ear and have a cochlear implant in which there's not a microphone in the ear, so the speaker isn't going, or the, the microphone isn't picking up what's coming through the speaker, so looking at how people are making the calls could give you a lot of information.

I like to know whether or not they're even trying their amplifications for phone calls at this point or not. Their phone needs, so are they talking on the phone throughout the day or do they just talk maybe once a day? Whether it's changed since they've gotten their new amplification, whether they're trying any assistive listening devices, whether that's a streaming option, whether they're using some kind of caption service or TTY-service for phone calls, whether they feel that they're understanding things when people call, and even if the phone rings, are they willing to answer the call, that tells you a lot. If they're not going to answer the phone because they're nervous about how

they're going to communicate, that tells you some great information. Do they call family members, or friends, or strangers? And then I ask things like, "Are you feeling comfortable enough to call a doctor's office to make an appointment? Are you willing to make those important phone calls or are you more interested in getting information, or only talking to people who you know well, and having somebody else make the important phone calls?" And then how successful they feel they're being when they do have phone calls. Do they feel like they're understanding most of the time, some of the time, none of the time? Are they having to ask for a lot of information? So with music appreciation, for assessment, again, this is generally for cochlear implant recipients, it's important to remember that to understand and appreciate music, you've really gotta be able to identify rhythm, tambour, and pitch. So again, tambour is the voice of the instrument, of which instrument it is. And those are all things that don't necessarily come through really well through a cochlear implant, due to how the cochlear implant processes and shares information with the brain.

So when assessing music appreciation, most of the time, I use more informal measures and just trying to get information about percentage of the time that people feel they appreciate music, what percentage of the time they feel like they can identify a song, and so forth. For people who are very serious about music, and like professional musicians, the Munich Music Questionnaire exists, and the Munich Music Questionnaire is very detailed and looks at many, many dozens of instruments and music skills and breaks it down. It's a very, very lengthy, it's a very, very lengthy questionnaire, and it's one that is available online, so you can just search for it and get it, and you'll be able to see it's a lot of information. It's probably too much for the average person walking in, but if you have somebody where music is their life and their world, it gives some really valuable information. The final information I wanted to talk about before opening up for questions is I always try to spend some time looking at technology use and how people are using their technology. Does the person really understand their buttons on their amplification and what they do and how to do them,

and do they feel comfortable using them? There's so many times that I've been told by somebody that they've got these new $6,000 pair of hearing aids, or they've gone through all the surgery and finally gotten this cochlear implant, and they're scared to touch something 'cause they're afraid of breaking it, and we don't want people to feel like they're afraid of it. We want them to know what buttons do, and the capabilities of their different programs and settings, so how to use each thing and when to use each thing. Do they know how to set up their hearing aid for noisy situations? Do they know, for a cochlear implant, which setting is the best if they're in a quieter environment? I wanna make sure they know how to pair their assistive listening devices if they brought them with them. Even if they're on them, I have them show me how they turn it on and how they use it. Particularly if somebody says they've got one but it doesn't help much, I want to make sure that they're using it correctly.

A lot of times I see people only half turn things on, and maybe they turn something on, but it's not streaming appropriately. So it's important to make sure it's being used to the best of its ability. And then I try to get some informal assessment about knowing when and how to maximize technology options. So do they know, in any given situation, what they can use and what they can do to create the best possible listening environment for themselves? So, in summary, adults should be receiving aural rehabilitation with any form of new amplification. We know that adults do show benefit from aural rehabilitation, so it's worth their while to invest in aural rehabilitation. It doesn't have to be people who have had hearing loss for a very long time, or people who have had their amplification for a long time and haven't made progress. It can be right away, and our testing should include many different measures and areas to get a full picture of their current performance. So at this time I'd love to answer any questions from participants. There is the question-and-answer box, so you're welcome to type questions in there, and then those get shared with me. There was a question that came in earlier, and that question was asking where we can access or find the Cochlear Corporation Rehabilitation Manual and Screen. So that should still be

available on Cochlear's website, in their store. If for some reason you're having trouble finding it, I always reach out to my region's representative, and they're usually able to get some of that information, so they can tell you how to get a hold of it, or might be able to get you a specific part of it if you're interested in getting it, but sometimes the name changes, but it's available through their store. Okay, so next question is somebody wants to, was asking about how do you locate aural rehab services versus going to the local hearing aid center? Unfortunately, there isn't like a website that lists those services for various states and cities. Some organizations might be able to guide you in the right directions, like the Hearing Loss Association of America, and some other options might be able to, they might be able to kind of guide you towards some resources.

What I kind of usually recommend is talk to your local hearing aid providers and cochlear implant teams and ask who they're referring to. If they don't have an adult name, what I do ask as a followup question is who would they send a child to. A lot of times, people who are working with children who have expertise and specialization in working with people with hearing loss are able to transfer those skills to the adult population and are sometimes willing and able to in their environment. The next question was about in-home aural rehabilitation services, since we're in this glorious pandemic at the moment. So aural rehabilitation services can be done through a tele-health model. There are some providers that are providing services. They're not as common, I don't think, as the pediatric, but there are people who are doing it. There's also some people who are doing it, tele-health and tele-practice, even when it's not the pandemic time. A lot of university programs are doing that, like I know we're able to do that. There's some issues with, when it's not a pandemic time, about providing services across state lines and some of those types of issues, but there are some providers who are able to provide telehealth services in multiple states, and a lot of university programs as well. So I think that, if I'm not mistaken, has brought us to the end of our time. I really appreciate everybody's questions and your attention in this

presentation, and just a reminder, if you were hoping for more information about therapy and goals, there will be a part two. For those participating in the live session, it'll be next Thursday, the 27th, and I hope we'll see many of you there to continue this conversation.

- [Jessica] Thank you so much, Lindsay. We really appreciate your time and expertise, and I wanna thank everyone who participated in today's course, and as Lindsay said, we hope you'll join us back for part two next week, if you are watching live. We do look forward to your feedback on the course evaluations, and hope to see you in future courses on speechpathology.com. This does conclude today's course. Have a great rest of the day, everyone.