Foundations of Cochlear Implants: Expectations, Rehabilitation and Monitoring Performance

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- - [Bobbi] Hello, thank you for joining Cochlear Today to learn more about expectations, rehabilitation, and monitoring for cochlear implants. My name is Bobbie Scheinin and I'm an audiologist and the Group Product Manager for Software and Clinical Care here at Cochlear. I'd like to personally welcome you to today's learning. At Cochlear, we believe in providing relevant and clinically valuable content to audiologists. And we welcome your suggestions for additional learning topics. This course is part of our Foundations of Cochlear Implants Series, which is designed for audiologists who are new to working with cochlear implants. It may be the only course that you need, but I would invite you check out the other courses in this series on our Expo page on Audiology Online. This course pairs well with the Determining Candidacy and Counseling for Cochlear Implants course that took place just a couple of weeks ago. It is available recorded on Audiology Online. During our hour today, I'm sure questions may arise. We'll take time for questions. Just jot them down or actually type them into the classroom on the right hand side of the screen and we'll address your questions toward the end of the hour. This course has been designed for all levels of clinical experience. And I look forward to not only the questions and insights that you bring, but also your review of today's course. Please be sure to share with us your views on today's learning by completing the review at the end of the course.

Today we'll review the topics you see here on the screen. Our goal is to provide you with an overview of rehabilitation and monitoring for cochlear implant patients as well as some practical suggestions for counseling and supporting your patients. We'll use this hour to help you feel more comfortable with the common concerns expressed by cochlear implant candidates and we'll also help you learn to predict outcomes and measure progress. We'll go over resources that can be used for aural rehabilitation and help you decide when extra support is required. Finally, we'll talk through the monitoring of your cochlear implant recipients and provide some recommendations for followup. Before we start, I wanna talk a little bit about Cochlear's mission. At

Cochlear, we have a clear mission. We help people hear and be heard. We empower people to connect with others and live a full life. We transform the way people understand and treat hearing loss. And we innovate and bring to market a range of implantable hearing solutions that deliver a lifetime of hearing outcomes. We'll begin today by talking about expectations for our adult patients. Prior to getting an implant, candidates will have many questions. Here is a common type of email you might receive. The candidate wants to know more about how a cochlear implant will work for her and what she'll be able to do once she has an implant. And she has some worries about surgery, something that is perfectly natural. There are several common questions and concerns that recipients express to us. In an effort to more fully support our recipients, we've been studying their concerns over the years and a recent internal survey gave us some valuable insights into our candidates concerns. T

he first thing that they may want to know is why, the why of the cochlear implant recommendation. Why not just a stronger hearing aid? How would a cochlear implant be different for them than their hearing aid? This may seem obvious to us as professionals, but perhaps not to the patient. It maybe is obvious to them, it may not be as obvious to them as to why a cochlear implant is being recommended. Another common concern is that they're too old. Much of the public is aware of the benefits of cochlear implants for children and the message of the earlier the better can be confusing to some of our older candidates. I heard this concern even from 50 and 60-year-olds who we obviously would not consider old so it can be surprising to find out this is a very real worry. Another worry is that, is related to the first in that the potential to lose what they currently have with their hearing aid, even though the overwhelming evidence tells us that a cochlear implant candidate will do better with an implant than they do with their hearing aid. This can be hard to conceptualize before surgery. In almost every case, our recipients tell us they would have had surgery sooner had they realized how much benefit they get from their implant. But this is hard to communicate to someone who is early in the candidacy process. Of course,

candidates express concern about having surgery. It's never a small thing to undergo a surgical procedure. And while a cochlear implant surgery is remarkably safe and effective, this needs to be communicated clearly to our candidates. Another question is exactly how a cochlear implant will affect their overall quality of life. This is a little different than it's just asking about benefit, beyond speech understanding. What are the things that they might be able to do or experience with their implant that they can't do now? Finally, candidates might be worried about the potential to lose residual hearing. Even in cases where there is a minimal benefit measured on audiological tests, it can be difficult for a candidate to imagine hearing in such a different way.

As I am sure you have realized, these concerns and questions can sometimes be different than what we as professionals have concerns about. In some cases, our concerns may overlap, but I think this list reminds us to focus on the individual themselves and what is most important to them. For example, while we might be most concerned with a patient's speech perception outcome, it is possible that the person sitting in front of you is convinced that they are too old to benefit from an implant. Asking more questions about their concerns will help you focus on what is more critical to them even if it's different from our most critical questions. It's useful for us to remember that there are different kinds of counseling when it comes to discussing expectations with our patients. This concept is also covered in some detail in the Determining Candidacy and Counseling for Cochlear Implants presentation. But there are really two different kinds of counseling audiologists engage in: informational counseling and emotional counseling. As noted here, knowledge learned does not change behavior. We can explain things at length to our patients, but until we engage their emotional needs and their overall need for change, we're not likely to change their behavior. When a patient expresses a concern to us, we need to know where the question is coming from and to know how to address it. Is it a request for information? Or is it perhaps a request for reassurance? Resistance to change can often be the outward expression of fear. It can, it may look like a candidate is asking for more

information by asking lots of questions and expressing concerns about lots of technical aspects of the implant, but this can sometimes be a reflection of underlying fear or concerns that are not informational in nature. It is important that professionals address resistance head on. You might say something like, "I see we're covering the same information over and over, "but you still don't feel comfortable proceeding. "How are you feeling about where we are, "that we're on the right track?" Resistance might be a cue to slow down or it might be a cue that there is an underlying concern that hasn't been addressed.

Only by asking outright will you be able to uncover the candidate's real needs. When providing information, ensure the candidate understands what's being shared. Have them teach back to you what they've heard and understood and also provide handouts and brochures where appropriate. Ask the question, on a scale of one to 10, how ready are you to proceed, to gauge their readiness and their feeling of self-efficacy. To keep your sessions efficient and person-centered, focus on their own defined goals. Providing true person-centered care requires that, for us to agree that the patient is on what is wrong and agreeing on what to do about it from the patient's perspective and point of view. Person-centered care works best with an imperative model. What this means is that the audiologist is there not just to inform the patient of their options, but to develop a co-shared understanding of how the patient is experiencing their hearing loss and develop a plan together to move forward. This means that the audiologist not only provides a patient with all the options, but helps lead the patient towards a solution that is based on the patient's needs. The clinician is not a neutral bystander in this model, but a collaborative member of the patient's team. As discussed in our previous module, Determining Candidacy and Counseling for Cochlear Implants, available recorded on Audiology Online, the Client-Oriented Scale of Improvement, or the COSI, can be an excellent tool to formalize a patient's concerns and goals for treatment. As we are all aware, our healthcare system is demanding more and more that we document our results and ensure outcomes are measured. The COSI can help

you do this in a straightforward and efficient manner. To use the tool, you will ask the patient to list the four or five most challenging listening situations. Ask them to be specific. For example, if they express that they're having difficulty hearing in background noise, ask them to tell you where specifically have they had the most trouble and in what situations.

Hopefully, then you'll get some more specific goals. Such as I have the most trouble when I go to Applebees with five or six of my close friends after work. This gives you a very specific target to improve and will allow for more easy measurement after treatment. It is recommended that you choose two to three goals at a time to work on. And the patient is asked to set a realistic goal, perhaps to help them feel more comfortable in noisy situations some or most of the time rather than using the word all of the time. Once the candidate's goals have been established, attention turns to helping them meet those goals. How well a given individual will succeed with a cochlear implant obviously depends on their version of success, but there are some factors that lead to better performance. If we understand these factors, we can not only help predict whether a recipient will meet their goals, but we can also be smart about how we interpret their progress after surgery.

As we'll discuss later, measuring and monitoring performance is an important part of the post-operative followup for our patients. A recent study by Lazard and colleagues looked at outcome data for over 2,200 recipients from 15 different centers in Europe. They gathered information on several different pre, peri, and post-operative factors and found the factors listed here to be the ones that had the greatest impact on overall performance with an implant. The factors that were associated with better performance included better residual hearing with the implanted ear pre-operatively, better preservation of hearing after surgery, more recent hearing aid use prior to implantation, shorter duration of deafness, and a higher percentage of active electrodes in the cochlea. Those who work with lots of cochlear implant patients will tell you that while

this data is helpful, each individual recipient is different. While these factors are found to be signific, can significantly impact performance in the study, all of them together only account for some of the variance in performance. While these things are important, they're not the only ones that determine how well someone will do. And it's clear that not all performance variation is accounted for by these known variables. There are always things that are hard to measure, intrinsic motivation, for example, or environmental stresses. Another important factor may be increased focus on practice and rehabilitation. As we'll discuss later, making this easier and more accessible to our recipients can be one way to help boost the performance of our recipients regardless of where they start. Given the many variables that can lead to the differences in performance and knowing what we know about individual variation in performance, what can we do as clinicians to help guide expectations? In collaboration with some of our colleagues in Sydney, Australia, Cochlear has developed "A Clinician's Guide to Managing Expectations." This guide provides an easy-to-follow expectations road map for different types of recipients. This guide is based on experience with thousands of recipients and can be especially helpful for newer clinicians to understand if their recipients are meeting expectations. The information is specific and comprehensive, but is also intended to be shared with the recipient themselves if desired. A copy of this guide is included in your handouts, but can also be accessed on My Cochlear Clinic under the Resources page.

To use the guide, you must first decide which of the categories fits your patient the best. Think about the time the deafness occurred. Was it pre-lingual or post-lingual? The duration of deafness generally refers to the amount of time the recipient has had a hearing loss within candidacy criteria. For example, if you have a 55-year-old who has had progressive hearing loss since age 18, you would need to ask specific questions to find out how long the hearing loss has likely been within the cochlear implant candidacy to decide the duration of deafness. If the person reports that they've been using power hearing aids since age 25, this is a longer duration of deafness. But if they

report that they've done well with hearing aids and could easily use the phone until a sudden drop in hearing last year, that would generally be considered a short duration of deafness. Short would be usually referred to a duration that's about five years or less. Anther thing to consider is whether the recipient had residual hearing preserved after surgery. Finally, if the recipient was pre-lingually deafened, their mode of communication can be considered. While each recipient may not fall perfectly within one of these categories, it should be possible to choose the closest category or just combine two if needed. Once you've identified the category, the guide provides comprehensive information about what type of recipients should expect at activation, one month, three months, and six months, and then long-term. I'd like to go over a few of our most common types of recipients so you can get an idea about how the guide can help you.

Let's start with the post-lingually deafened recipient who had a relatively short duration of deafness. Imagine someone with a long, progressing loss that only just reached moderate to severe a year or two ago, or possibly someone with sudden hearing loss that's only a short time ago. Here is a small sample of what the guide tells us to expect at activation. This recipient should expect that sound, speech sounds familiar excuse me, but possibly unrecognizable at activation. They may be able to deduct, to detect sounds across all frequencies and possibly recognize common phrases. It is typical for a recipient like this to feel somewhat disappointed or nervous about the sound at first. This is a helpful thing for the new clinician to be aware of since we can then let the recipient know that this is normal and things should get better for them over time. Finally, the guide provides some suggestions for practice, which for this type of patient include suggesting practice at least 15 minutes per day. If we follow this patient to the three month timeframe, the guide gives us an idea of what we might expect. This type of recipient may be starting to listen to music. We can expect them to participate in conversations even without lipreading and start to comprehend information that is recorded or on the radio. From the initial nervousness, this recipient should now be

starting to experience new activities and hopefully be happier with their performance. The guide suggests a continued focus on listening in many different environments. The long-term expectations for this type of patients are very high. We expect very good performance in quiet and expect them to be very happy with the quality of the sound they're getting. We would expect that they can use the phone, although the guide reminds us that some situations may still be difficult and this can sometimes lead to some concern on the part of the recipient. I hope this gives you a flavor for the kind of information that the guide has. While these are general expectations, of course, it will not be perfectly applicable to every one. It's helpful for a new clinician to know what to expect.

Should you find that you have a recipient who is not meeting these expectations, contact your Cochlear representative for further support. Let's look at another type of patient that's typically seen in an adult clinic. This is someone with a longer duration of deafness, but one who still has some residual hearing. At activation, a recipient like this will hear speech, but it will likely sound unrecognizable or like static. Things may be too loud for them, but they should be able to tell the difference between two different phrases based on the length. It is possible the type of recipient may not be comfortable wearing the device all day and may be frustrated with the way things sound. So rather than any specific practice, the guide recommends moving up to a full-time device use as the best rehabilitation start. You can see the contrast length of deafness makes for our expectations. Knowing this can help you prepare your patient for what to expect at activation and beyond. And it helps you to know that if you're hearing from your recipient is normal for their profile. As we move forward with this patient, things are starting to become clearer. The signal should be more speech-like and they should be starting to recognize common words and phrases, especially from a familiar speaker. They should hopefully be feeling more independent in daily life and the guide recommends focused listening practice to help them continue to improve. Long-term expectations, even for someone with longer duration of deafness, are still

very positive. The recipient should show a marked improvement from their speech perception scores and be able to use the telephone, especially in more controlled circumstances. Performance can continue to improve over time, even after years of implant use so continued listening practice is recommended. It may be that this type of recipient is surprised that they need to continue to work on their hearing even long after activation, but the goal is continued improvement for the long-term. For this category of patient, the more effort they put in, often, the more they will get out of their device. Finally, let's take a look at a patient with a longer duration of deafness with no residual hearing. As you can imagine, it's likely to be tougher for this patient at activation. Sometimes they'll hear what, they'll hear what sounds like static, squeaks, noises, or beeps from the signal. They can detect speech, but it doesn't sound familiar and it may be hard for them to tolerate wearing the processor all day.

Again, this information can be critical to pair with the long-term expectations or this patient may struggle with initial activation. Let's look at the long-term expectations for this patient. This type of patient can still have very good outcome over time, sometimes scoring up to 100% in quiet and understanding information provided on recordings or the radio. This patient may still require lipreading and captioning at times, but their overall performance and quality of life should be significantly improved from their pre-operative situation. As we close out this discussion on adult expectations, I'd like to stress that your Cochlear representative is always available for recipients who are not meeting expectations. I'd encourage you to contact them for a case review any time you're concerned about the patient's expectations. Let's switch gears a little bit and take a moment to discuss expectations of our pediatric patients. There have been numerous studies looking at the performance outcomes for pediatric recipients with cochlear implants. Of the many different factors that may influence how well they do, let's discuss the ones that have been shown in multiple studies to be important. The first is the use of a spoken-language communication approach. While some studies have shown that the use of sign language prior to implantation can be beneficial for

overall language development, a focus on oral language development after the implant has been activated, after the implant has been activated, appears to be critical for the success with the device. The next one is an absence of additional disabilities. Those of you who work with children are very aware that many have disabilities to contend with other than their hearing loss. For some, this might mean a mild learning or attention deficit.

But for others, this can mean severe physical or cognitive disabilities. While it may seem obvious that additional disabilities will impact outcome with an implant, remember that many children receive their implant before the time when some disabilities can be diagnosed. A learning disability, for example, or an attention disorder may not fully be apparent at age one when a child received an implant. So long-term performance concerns should always be considered within the context of the child's overall development. Likewise, nonverbal intelligence can have an impact on the child's success. Age at implantation is another strong predictor of overall performance. The younger a child is when they receive their implant, the better they do. Socioeconomic status also predicts success. There has been some interesting work showing that this may be related to age at implantation in that child in higher socioeconomic situations tend to receive services earlier, but the full extent of this remains the focus of some study. Higher maternal education can have an impact on success. Parents with higher vocabulary and perhaps a higher verbal ability themselves may be better positioned to support their child's language learning. Finally, some new studies have found that maternal sensitivity to communication may be a very important variable that predicts success. These last three factors are really critical findings since they help us to craft and deliver rehabilitation services in a more impactful way. Several new strategies presented at the recent Cochlear Implant Conference, such as the River School's Parent Child Interaction Therapy, or University of North Carolina's Strength-Based Coaching, focus not only on the therapy for the child, but on supporting and strengthening their family as well. Given that many of the variables that

can impact performance for pediatric recipients may be unknown at the time of implantation, discussing expectations with parents should be considered carefully. Recent surveys have shown that some parents feel their expectations were met with the implantation and many report their children are able to participate in regular classrooms. Importantly, parents assign positive ratings to health-related quality of life, especially in the communication realm. So now we've talked about adult and pediatric expectations, let's talk a little bit about rehabilitation for patients with cochlear implants.

When we talk about rehabilitation, we should consider that there are many different levels of support we can provide our patients. At its most basic level, simply wearing the device full time can be considered a form of rehabilitation. As mentioned earlier, for some long-term deafened individuals, this can be a goal in and of itself. Another goal for recipients is device use in speech. Data-logging can help us identify individuals who are in quiet most of the time and we can use this information to encourage them to gain exposure to more speech input with their device. Moving into aural rehabilitation in a more traditional sense, recipients may do some self-practice with their device. Things like books on tape or speech tracking with a partner are often suggested as good ways to practice informally. For recipients who need a bit more support, some type of formal aural rehabilitation program might be beneficial. This might be self-paced or done by the recipient at home. Or it could be a part of a guided practice where the audiologist or speech language pathologist provides practice materials and monitors performance. The highest level of support might be a formal therapy type program. Imagine a more traditional speech therapy session or auditory verbal therapist. These sessions may be covered by insurance since many insurance policies state that followup care is covered in order to maximize implant use. Direct therapy is the most labor-intensive of the rehabilitation types, but also needed for fewer numbers of people since most recipients do very well with most, with some of the suggestions lower down in the pyramid. While this type of rehabilitation is rarely essential for adult

recipients, it can sometimes be what comes to mind for patients when we talk about rehabilitation. So we should be careful to specify based on expectations what kind of rehabilitation we expect is needed post-operatively for someone considering their implant.

Let's start with some ideas for encouraging device use and device use in speech. As mentioned previously, data-logging is available in the software to review at patient's followup appointments. Audiologists now consider data-logging to be standard of care with hearing aids and is a critical part of any counseling session after a patient is fit. The same is true for cochlear implants. Data-logging can help you understand the causes of a lack of progress. Consider two patients. Both are failing to meet expectations three months after device use. Imagine now that the data-logging is different for the two patients. One demonstrates full-time device use, but the other is showing low overall hours of use and several times when the device is switched on, but not on the head. These are two very different cases for you to trouble-shoot. The one who is wearing their device might need different mapping or counseling about guided aural rehabilitation options. But the patient who is not wearing the device needs a conversation about how to increase device use and what the barriers might be to device use. In this way, data-logging helps inform your recommendations about aural rehabilitation. A brand new tool that's available for recipients themselves is called Hearing Tracker. This is a way for recipients to monitor themselves how much time they're using their device and how much speech they're being exposed to.

They can set goals and try to reach those goals. Since device use is critical for success with an implant, encouraging them to use Hearing Tracker is a great way to get patients on the road to better performance. There are lots of ways recipients might use this tool. One example is to consider Dr. Dana Suskind's 30 Million Words Initiative. This goal, the goal with her initiative is to encourage families to tune in, talk more, and take turns with their children while speaking. Imagine how Hearing Tracker can help

families track how well they're doing at increasing speech time for their children. Moving on to self-practice, here's some ideas for how recipients can practice on their own without any kind of formal program. Books on Tape are a very common recommendation with today's audio books available on most Smartphones. They're more accessible than ever before. It can sometimes be helpful for recipients with poor speech perception to start out with a copy of the book itself. This allows them to follow along visually and do some speech tracking before they try listening alone. Other helpful ideas might be to listen to podcasts, news broadcasts, or even sports broadcasts. One idea is to turn a sporting event such as baseball on the TV and turn the volume down. Then put the same game on a radio broadcast. The radio broadcast is usually has less background noise than the TV broadcast and can be simpler to follow.

But having the TV available allows for some visual support to help with the listening task. One final suggestion are English as Second Language materials. While these are designed for people who are learning to listen to English, they can often be really helpful materials to help individuals with hearing loss. Cochlear works hard to connect patients with rehabilitation, even when it comes to their self-practice. The made-for-iPhone technology in the Nucleus 7 and access to true wireless accessories with our Kanso processor also provides a way for them to connect to their device. Made-for-iPhone is, particularly makes access to audio books as easy as thinking of a book and pressing play. At a recent company event, we heard from a recipient whose been implanted for several years, but recently upgraded to the Nucleus 7, which has made-for-iPhone capabilities. Because it was so easy, she started listening to podcasts and became a fan of one particular podcaster. This new podcast not only opened up a whole new world for her, but actually improved her speech perception scores all these years after getting her implant. Easy access was the key to her success. Some recipients benefit from more formal program, but still prefer something self-paced that they can complete at home. One great option is an online program

called Angel Sound. This program is freely available online and could be downloaded onto a home computer for self-paced practice. Cochlear's also proud to offer guided practice resources for our recipients. All of our resources are gathered in the Communication Corner, which is designed to provide a personalized program for listening practice for any recipient. The Communication Corner is well-organized and easy to navigate. It is the most visited section of our website and is extremely popular with our recipients. The most popular program continue to be Adult Communication Strategies and Telephone with Confidence.

There are groups, there are programs for every age group. You select the age group that best describes the person for whom the program is intended. Each program description comes with a sample exercise so you can try it on for size to see how it fits. Completing the accompanying assessment tool provides guidance on where to start in the program and how best to use the selected program. At the end of each program, you'll get a recommendation on which program to begin next. The Communication Corner is designed to be completed by the recipient themselves or in partnership with a listening partner. Professionals are also welcome to assist them in creating a program and getting started. All of the materials are freely accessible and can be printed if desired. The Communication Corner is not just for adults. Programs are available for young children, school-aged, and teens and tweens. Again, the programs are designed to be used by families, but can also be extremely helpful for speech pathologists and educators, especially those who may be new to working with children who have cochlear implants. I'd encourage you to check out all of the Communication Corner for all of your patients, not just those with cochlear implants. It can be great for patients who are new to using hearing aids, those with Baha, or those with other hearing devices. To get started in the Communication Corner, you choose the age range first, and then once you click into the age range, it provides you with a description about the program that's available. The program description talks about what the expectations are for the program and then gives you a program sample. So

this one is actually an activity in family conversation game and gives you an idea of how you could actually run this type of a program while you're sitting at dinner. The important thing about Communication Corner is it's scalable as well. So parents can actually download all of the materials on their Smartphone and have them accessible at any time. When the program sounds like it's something that will fit, you press get started here and you come to the assessment.

This quick assessment tool helps guide the recipient as to where to start within the program. There's always access to earlier materials if you want to practice more, but the assessment provides a starting point. Once the assessment is completed, each person will receive an email that's sent to provide a starting point for the recipient. While an email isn't required to start the program, there is no cost for the recipient and can be used by anyone, even hearing aid users or candidates prior to implantation. Also, once someone is signed up for one program, they have access to all of them and can even go back to other parts of the program. Use of a telephone can be a common goal for implant recipients and practice can really help improve performance, but it can be challenging to set up good practice scenarios with a phone when you have to rely on someone else to help you out. One specific program I'd like to highlight is Telephone with Confidence, one of our most popular programs.

There's an 800 number that can be called each and every day as there are different word lists that happen every day. There's also a short and long reading passage and they're broken up by male speakers, female speakers, and speakers with accents. Recipients can access the word lists and the reading passages online to follow along visually with what they're hearing when needed. It's also a great tool to use when introducing made-for-iPhone capabilities or the phone clip. It may be daunting for a recipient to try the phone for the first time or learn how to connect with the made-for-iPhone or to, when to turn on the phone clip. So Telephone with Confidence can be used to help build their confidence with their accessory and improve their

overall experience. So we've talked about expectations, we've talked about rehabilitation, now let's get a little bit closer on monitoring performance of cochlear implant patients. Measuring performance for recipients of cochlear implants is extremely important. It allows us to measure outcomes, but has several other uses as well. Objective performance information can be used to help counsel recipients. Consider a recipient who has had concerns about their performance. Objective testing allows you to compare performance over time. Perhaps there has been an improvement in objective performance even though the recipient is not doing as well as they had hoped. This is critical information to inform your counseling and help plan further support for the recipient.

Another important use of performance measurement is to record a baseline of performance. This can then be used to measure performance over time, possibly helping with the case for future upgrades. The materials used for measurement of performance are generally the same ones used when we do candidacy testing. The Adult Minimum Speech Test Battery is the most commonly used. CNC words and sentence testing and noise are especially helpful to monitor performance post-operatively. More information about the MSTB may be found in our other course, Candidacy and Counseling, or by visiting the Auditory Potential website. Just like with adults, the Minimum Speech Test Battery is available for children. Don't get overwhelmed by the slide. This test battery is designed to be standardized and evidence-based and provides clinicians with a clear road map for testing the speech perception of children. This diagram is from the MSTB for Children. Each of the tests shows a recommended and the testing order is indicated by the arrows. The MSTB includes stopping criteria for tests that are less than 25% in red, continuation of testing, 25 to 75% in yellow, and ceiling scores of greater than 75% in green. Each test is listed in order of difficulty and the arrow indicates the next test in the protocol based on performance. For example, if a child's performance exceeds 75% on the ESP Monosyllable Task, the child has reached ceiling performance level and should

transition to the PSI Word Test. However, if a child scores less than 25% on the ESP Monosyllables, then the clinician should select an easier auditory task, the ESP Spon Ds. Each testing session should strive to include at least one word and one sentence recognition task if possible. The protocol included in the pediatric MSTB provides a road map for testing as a child's auditory skills improve. While you may wish to change or add tests at your individual clinic, the pediatric MSTB is a very helpful starting point for clinics. We're often asked how often recipients should be seen for followup. At a minimum, it's recommended adults have four visits for the first year: activation, two weeks after activation, one month after activation, and three months after activation. Annual visits are needed, may be considered after that time. The visits in the first year are mainly focused on providing patients with a stable map and counseling them about the use of their device. Time can also be spent on aural rehabilitation as needed. Some regular monitoring of performance is recommended, often on a bi-annual basis. Speech perception testing can highlight the need for reprogramming if compared to a baseline and the patient is not performing as well. Can also indicate when a patient is doing well and no changes to the map is required. Pediatric patients are usually seen more often in that first year. Their followup schedule is largely dependent on age. And you'll find that the smaller the child may require more frequent mapping visits while older children may be seen on a schedule that more closely resembles that of adults.

As a reminder, speech perception testing should be completed at least annually. All right, so we've walked through expectations, we've talked about rehabilitation, and we've talked about monitoring progress. Now I wanna give you just a couple of case examples that will allow us to highlight each of those. So let's take a look at this first case where monitoring of performance was critical. This case is an 86-year-old gentleman who was implanted seven years ago. He's done very well with his device, but arrived for his usual annual visit and reported a decrease in his performance. His daughter, who came with him to the visit, feels he's not responding when spoken to and she notes he may have hit his head during a fall a few weeks ago. They called

Cochlear to report the difficulty and replacement sound processors were sent with no charge, but created no change in his performance. Let's take a look at the performance testing that was completed for this patient. You can see here that he had a significant improvement in his speech perception over his pre-operative scores. Pre-operative versus five years versus now. Luckily this baseline helps us to evaluate his performance. Testing in the booth reveals performance has been relatively stable for him, at least on the speech perception measures. There may be a slight decrease in his performance in noise, but his performance in quiet is similar to what was at his five year post-activation visit. In this case, the speech perception testing may help shed some light on the patient's complaint. While there has been a perceived decrease in his performance, objective speech testing doesn't reflect this at all. So what could be going on with him? On further questioning, speech perception testing helped the clinician open up a broader discussion about this patient's overall health. The family reported difficulty in the other areas including some memory concerns.

The clinic completed a Mini Mental Status Exam and did find some concerns about cognitive status so they referred him for followup. This case illustrates not only the importance of testing speech perception after the difficulty starts, but before as well since the baseline information helped the clinic evaluate his progress. Another case example is when monitoring of performance might be helpful. This is a pediatric example. She is now three years old, who was implanted at the age of 18 months, and she's wearing her bilateral processors full-time. Her parents arrived concerned about her performance. They don't feel like her words are very clear and they say she only has a few words. Before jumping straight into a map change based on their complaints, it's really worthwhile to check into her performance to see how she's actually performing. You can see from her scores here that her speech perception has really improved greatly and she appears to be hearing well with her device. In addition to the testing here, a sound field audiogram, and check of her data-logging is also extremely helpful to see how the device use is going for her. You can also see some

language testing that was performed by the speech language pathologist. This is extremely useful information for us. She's making nice progress with her vocabulary and her age equivalencies show that she is making progress at a rate that is slightly faster than her 18 months of device use, which is what she will need in order to catch up with her normal hearing peers. The speech language pathologist in this case was happy with her performance and felt that it was on-target given her time with the implant, especially considering the fact that her family is bilingual and she's learning English at school and they're using their native language at home. All testing for this patient was done in English. Often, a child's articulation follows after their receptive abilities. While she is three years old in her family's eyes, her hearing age is only 18 months and is more appropriate to evaluate her language against this benchmark. The audiology team was able to confirm she was hearing well with her device and the speech language pathologist provided some assurance, reassurance that she was doing well and continuing to make progress. Monitoring and testing in this child's case were critical to helping her continue her success and allowing for a better counseling experience with her parents.

To summarize our learning today, expectations can be addressed with your candidates by asking them to set goals. Using tools like the COSI will help you and your candidates have realistic conversations about what they would like most to achieve with a hearing implant. You can then have more specifically addressed the likelihood that they will achieve those goals based on their hearing history and profile. Monitoring performance is important as the cases show us. It can only give us data about how someone is doing, but can help direct us towards the best way to help that patient now and in the future. And finally, I hope you've learned something about the rehabilitation options that are available for our recipients. I'd like to thank you for joining our course today. If there are any questions, I'd be happy to answer them. The first question. The first question is about can you speak more about the Cochlear Concierge? Absolutely. So Cochlear Concierge is actually a service that we provide for cochlear implant or

Baha candidates. And the Cochlear Concierge are all audiologists and they provide guidance through the candidacy process for the candidate. So they'll answer questions about the surgery itself, about expectations. So they are a support system to you in terms of being able to help that candidate understand what will happen once they get their implant. Now, all of the Cochlear Concierges are either implant recipients or they have children with implants. So they personally have gone through the process and can provide invaluable information to the candidates to move them through the candidacy process. All of our candidates are open to call Cochlear Concierges. If they're not comfortable communicating on the phone, they'll communicate with them via email. We've even had our Engagement Managers meet with candidates if that's more helpful for them. Great question.

And I have another question about the Communication Corner. Communication Corner is free. It is available on our website and it does provide access not only for people who have cochlear implants and a way to actually do some listening practice, but it also provides information and tools for candidates, hearing aid users, and Baha users. We have a lot of professionals that visit the Communication Corner and download the materials that we use so that they can actually use them with their own recipients. Someone is asking about how we get the MSTB. So can we get it from Cochlear? The MSTB is available on that website. We do have CDs available if you're interested in the Minimal Test Speech Battery for your patients. One more question. What does informational counseling provide? So remember, again, there are two different kinds of counseling: informational counseling and emotional counseling. Informational counseling is really talking about the data, the information you want to pass on to the patient. That emotional counseling is taking into consideration where the patient is, where they're sitting with their hearing loss and their ability to hear, and providing them with the information that will support giving them, the informational counseling gives them kind of the product information and the expectations along with the emotional counseling that's provided. Where is Communication Corner exactly? Under what

folder? So Communication Corner is actually available on our website or you can type into Google, Communication Corner by Cochlear, and you'll pop up with a link as well. Someone said, okay, this question is someone asked me to talk to you about the bucket of frogs. Can you tell me more about what that is? So on the Communication Corner, under the young children and families section, there are a series of games that you can play. Cochlear has available, today it is the bucket of frogs. We've had in the past bucket of butterflies and fun on the farm and the zoo crew, but it is a small bucket basically with toys and about 10 different games that are specific to speech and language development. And each one of those cards has varying levels of difficulty in the game so you can actually move through those cards and increase the level of difficulty within the games using the toys that are in the bucket. So our current bucket is called the bucket of frogs and it has frog-themed games that you can play. So you can contact your Cochlear representative and they'll be able to get you a bucket of frogs. Any other questions about anything that we've talked about today? Okay, that wraps up our presentation. Thank you very much for attending. You can connect with us on Facebook, LinkedIn, twitter, or at our website, www.cochlear.com/us. Thank you so much for attending and have a great day.