

*This unedited transcript of a live webinar is provided in order to facilitate communication accessibility for the viewer and may not be a totally verbatim record of the proceedings. This transcript may contain errors. Copying or distributing this transcript without the express written consent of continued is strictly prohibited.*

## **Single Sided Deafness and CIs: Pre- and post-operative evaluation and outcomes, in partnership with the American Academy of Audiology**

**Presenters: Jerome Evans, AuD, Maryann Flores Zurriga, AuD, CCC-A**

Today's course is Single Sided Deafness and Cochlear Implants, Pre and Post Operative Evaluation and Outcomes in partnership with the American Academy of Audiology. Our presenters today are Dr. Jerome Evans, he practices at the Cochlear Hearing Center, San Antonio, Texas where he specializes in implantable devices and Maryann Flores Zurriga, who is a licensed audiologist specializing in cochlear implants at the Cochlear Hearing center in Houston, Texas. I'm going to go ahead and pass the MIC over to Dr. Flores Zurriga to start us off. Thanks everyone. Hello everybody.

Before we begin, a few words from the Academy. I'm just going to play a short video. Welcome. I'm Tish Gaffney, the President of the American Academy of Audiology and I'm here to share important information about the organization. The Academy is dedicated to achieving recognition of audiologists as the experts in hearing and balance care and the field of audiology as an independent clinical specialty that is integral to the healthcare team.

Through our partnership with Audiology Online, we're excited to offer courses like this one to help you broaden your knowledge and skills. We also offer the latest resources in practice management and evidence based clinical practice so you can grow professionally and improve patient care. We advocate for our members in Washington and across the country to ensure that the voices of audiologists are heard and we help connect audiologists to one another through our valuable networking opportunities like our annual convention. To learn more about the Academy, make sure to visit [audiology.org](http://audiology.org) thank you. Alrighty, I'm going to go ahead and start.

First of all, these are our disclosures for the presentation. I do want to give Special thanks to Dr. Terry Solan. She's not presenting with us today, but she definitely attributed to our presentation and I just wanted to give that shout out. These are our limitations and risks and here are the learning outcomes for the presentation. To start, I want to go over the importance of this topic by giving the prevalence and statistics.

Here in the United States, 5.2% of adults have been diagnosed with a unilateral hearing loss. Now, Specifically from these, 345,000 have single sided deafness. So there's a lot of patients out there with this condition, right? 80% were due to a sudden onset. That's what we might normally see in the clinic.

However, there are obviously other etiologies that rest will be due progressive conditions. This could include Meniere's disease, autotoxicity, autoimmune disorders, other genetic mutations, etc. So it's important that we understand the condition and the causes, as well as the impacts these deafness can provide for this population. I also want to go over the statistics when it comes to our pediatric population. In one of a thousand infants are born with unilateral hearing loss and 40% unfortunately are at risk of progressively losing their hearing in that far side.

And 20% even having a progressive hearing loss for both ears, eventually jumping from single or unilateral hearing loss to bilateral. And this is very crucial in children. As we know patients, hearing is important for speech and language development, cognition and overall quality of life. There is an increased risks in these patients to have psychosocial and behavioral issues in school because of the hearing loss. So we need to then think what are the treatments so we can better help these patients?

And that's what I'm actually going to go over next, the treatment options. Now there's many and I'll briefly go over. First of all, we can do nothing, right? There could be the no treatment option, which is easy for many because it doesn't require any surgery, any extra steps. Now the unfortunate truth is that when there's no treatment, patient will suffer their full disability because they're not able to hear out of that one side.

And then that's when we might want to consider the next options. We have CROs or by cross hearing aids which are easy to trial and it can alleviate head shadow. But patient is not really having that binaural hearing and it could be expensive. As we all know, insurance may not cover for these devices for every person. Next we have bone conduction as another potential treatment.

It can also alleviate head shadow and it can be trialed before surgery. But just like with the CROs and binaural hearing aids, there is no binaural hearing possible with this treatment. It can be covered by insurance, which is a plus. And lastly, the topic for today are cochlear implantation as another form of treatment for single sided deafness. We can have binocular hearing with cochlear implants, which is the only one that can provide is however unable to be trialed because it requires a surgery.

The good thing however is that it can be covered by insurance and it is a great way of treating this hearing. And that's what again we're going to talk about today. So why consider a cochlear implant for patients with single sided deafness?

There has been a lot of research. This is actually from the 2021 New York study by Deep and colleagues and they asked themselves that same question and specifically they asked the Patients, why did I decide to pursue a cochlear implant? The number one reason was debilitating tinnitus. And this is a common concern for many patients with hearing loss to begin with. But it is crucial that we understand that for specifically those with single sided deafness, it is the number one reason why they will decide to get a cochlear implant.

There were other reasons as well. Like patients having difficulty hearing a noise, you don't have two ears, it will make it a bit challenging to hearing that condition. As well as having sound localization, there were other reasons as well. These patients also tried CROs and baha, which were the other treatments that I discussed and they had no benefit and they wanted to have a better hearing.

The impacts of patients with single sided deafness are great. As I mentioned, not being able to hear from two ears will impact greatly their localization. If we only hear at of one side, we have not, we don't have that binaural communication right for that localization and then also, as I said, will impact hearing in noise. Not being able to hear from that one side has resulted in tinnitus in many of these patients and

it has led to many having embarrassment and frustration, fatigue, withdrawal and overall degradation of their quality of life. It is very interesting in this population, as we will discuss further, because these patients may think, or want to think that they are normal because they have normal hearing in their other side.

That's what adds a little bit of complexity in this population. And again, that's what we'll talk about today.

But the good thing is that there is a lot of evidence in support for cochlear implants in this population to help them hear better. Research has shown that with cochlear implantation, patients can hear better in noise, their localization can be improved and it can decrease their listening effort as well as suppressing their tinnitus in up to 50 to 90% of the cases as we'll discuss, every patient is different. But I think it's always very encouraging when we have research to support the benefits the cochlear implants can have. Again, in this population. Overall, the patient can hear better if the tinnitus is suppressed, then we then see an improvement in overall subjective performance and quality of life.

I do want to note that there has also been a lot of research to note the benefit of using perimodular electrode array in comparison to a lateral wall, as this has shown to reduce pitch mismatch in these patients.

Now I'm going to hand it over to my colleague, Dr. Evans, who will be discussing candidacy and evaluation.

Thank you, Dr. Flores. So moving on with the treatment pathway for candidacy and evaluation. So we want to talk about who is a candidate by definition and who is a candidate based on the evaluation. So using our professional judgment, there is a difference. So let's jump right on into it.

I want to make sure that we understand the difference between indication and candidacy. Indication is the rule, or in our case the FDA guidelines that tells us who is eligible for a cochlear implant candidacy. On the other hand, we look at the whole person. There are additional factors that may be equally if not more important than simply following an indication for medical treatment. As audiologists, we recommend the best treatment option for our patients as individuals and not solely based on the audiogram and speech perception scores.

Another way to look at indication and candidacy is that indication is the rule. It's black and white. Candidacy allows us to be professionals and use our clinical judgments treatment. We are able to use our clinical judgment because the FDA just that their guidelines, not the law. As audiologists, we have to consider insurers indications when determining that the ear to be treated is a good candidate for cochlear implantation.

So basically when hearing aids are no longer enough to improve the patient's quality of life.

So I also want to take another minute to break down why understanding indication and candidacy should not be interchangeable. And understanding the difference is what allows us to use our clinical judgment to treat our patients. The graph to the left defines unilateral hearing loss. So the candidacy one ear is normal or near normal and the other suffers from some severity of hearing loss. The graph on the right is the indication.

The black and white definition of single sided deafness, which is one ear is normal to near normal hearing and the other ear has a severe to profound sensorineural hearing loss. So 80dB or greater. As you can see, there is overlap with the single sided deafness indication since it's a subset of unilateral hearing loss. This overlap allows us as audiologists to treat the whole person. And you'll see examples of this later in the case studies.

So what exactly is the FDA indication for cochlear implantation for those with single sided deafness? So this here has the unilateral hearing loss single sided deafness for cochlear implant indication. There's a lot to take in here. The single sided deafness indication for cochlear implantation includes the following. You should be five years or older.

The ear to be implanted must have a Severe to profound sensorineural hearing loss defined as a PTA of 80 dB or greater at 500, 1000, 2000 and 4000 Hz and speech scores must be less than or equal to 5% when using a developmentally appropriate word test. And for most of us who are seeing adults, that would be the CNC words. There are contraindications that are indicated on there but cochlear implant is not a suitable indicating that cochlear implants is not suitable a suitable option for everyone who has single sided deafness and most of them are medical in nature. But I do want to point out here that there is one contraindication that was removed and it will also be referenced in one of our case studies. So patients who have lost their hearing due to lesions of the cochlear nerve or central auditory pathway, they now meet the FDA indication for cochlear implants.

So basically, if you have a patient who is diagnosed with an acoustic neuroma, they now qualify for getting a cochlear implant assuming that there is a presence of the cochlear nerve that's been confirmed by the MRI prior to surgery. Now that we know the indication for single sided deafness and cochlear implants, it's time to do the evaluation.

With the MSTB3 we are focusing on the ear to be treated. A hearing test is done to determine if the patient is audilogically a candidate based on the indications that I mentioned earlier. So one ear is normal. The other ear has a severe to profound sensorineural hearing loss. Then we shift our focus to the ear to be implanted so that poor ear there's a to speech testing that is done using verified hearing aids.

At the cochlear hearing center. We mask the better ear or the normal ear using inserts and we administer the CNC words at 60dba. The MSTB3 also recommends evaluating the patient's everyday listening using azbio and noise. This way you're considering the whole person. So think about the candidacy and it also may help with the insurance coverage so meeting certain insurers indications and they also recommend subjective questionnaires that should be used to evaluate the patient's quality of life.

For a single sided deafness they also need to go through medical evaluation. So even though they've met the audiologic indications that I mentioned earlier, they will need a medical evaluation. So you have the physical examination which includes the status of the middle ear in the cochlear anatomy. You need to do some imaging to rule out any anatomical abnormalities. And there are also some patient variabilities that will be considered such as duration of hearing loss.

But I do want to point out that some of the surgeons that I've been working with, they've been fairly lenient regarding those who have suffered from single sided deafness for more than 10 years due to research being available showing improved outcomes. The surgeons will also want to know how debilitating the tinnitus is and patient expectations. Make sure they're realistic. So after the cochlear implant evaluation, we want to inform the patients with single sided deafness that a cochlear implant is the recommended treatment option. And this discussion helps the patients with realistic expectations.

Depending on the office setup and resources available to you, you may not be the one doing the counseling. However, I anticipate for most of us here today that we are doing the counseling with the patients. During counseling, we want to consider the whole patient. As you explain the hearing journey with a cochlear implant, you want to learn about what is important to the patient, where do they notice the most communication difficulties and with whom subjective measures help with obtaining that information. And here are some subjective measures that can be administered at the cochlear hearing

centers.

We use different questionnaire that you'll see in our case studies. Also, by considering the whole person or the whole patient, it helps with documentation, especially for certain patients who do not meet the traditional FDA indications. So basically those patients who have poor word to scrim but their PTA is better than addb. So remember, as audiologists we can use our clinical judgment by providing supporting documentation of why we're recommending a cochlear implant to treat the poor ear. In addition, subjective measures will help insurance and sometimes us as audiologists understand the communication frustrations and dangerous situations and individuals may have while when relying on one normal ear.

As audiologists, there are other important questions to consider for our single sided deafness patients and they're here on this slide. I want to make a comment on the vestibular function portion. I did have a patient that was referred to me for a BAHA evaluation and I didn't have any notes from the referring office and it was a single sided deafness. So I was thinking, hey, let's get you into a cochlear implant. And while I was discussing this option with them, the patient finally decided to share with me that the etiology of their hearing loss was from the removal of a tumor and that the eighth nerve was severed.

So, so we'll see examples of these other considerations in the case studies later on.

And we also want to know are their goals reasonable and is the patient willing to wear the device all day and do daily rehabilitation?

So more counseling. And I know I'm being very repetitive, but I really want to reiterate the importance of counseling to you as the audiologist and the patients to make sure you both are on the same page. So when it comes to counseling, we must discuss realistic expectations. We must consider the duration of hearing loss. We want to consider the patient's social health.

So basically, are they working? Are they primarily at home? Do they have hobbies that involve social interactions or are they more quiet hobbies like reading or gardening? And we also want to know the etiology of the hearing loss. I cannot stress enough to the patients the importance of wear time.

We recommend 10 to 12 hours. Utilizing a cochlear implant must become the new normal all day wear time provides opportunities for the brain to create the neural synapses needed for communication.

Benefits There is value to sending sounds directly to the implanted ear when it comes to rehabilitation. So we recommend about 30 to 60 minutes five days a week. I usually inform my patients that in the everyday listening condition, the implanted ear just wants to hang out while the normal hearing ear does all the work.

So by isolating the sound CD implanted ear with streaming, we'll put that ear to work. I said a lot in regards to counseling and it's challenging to retain all this information. But just imagine how challenging it is for patients with hearing loss and how easy it is to forget the efforts needed to benefit from a cochlear implant. So here at the cochlear hearing centers, we actually rely heavily on engagement managers or volunteers to help reiterate the realistic expectations and the anticipated benefits of how a cochlear implant can help with their quality of life.

So some key takeaways not every patient with single sided deafness should get a cochlear implant. As audiologists, we need to use our professional judgment to determine the right candidates, get to know the whole person so we can provide realistic expectations on how cochlear implants can improve their quality of life. You also want to work with a patient who is motivated to move forward with treating their poor ear. Because if they aren't, the journey for both you and the patient will be frustrating.

One more thing that I hope you're all starting to realize is that patients with single sided deafness are unique. As Dr. Flores mentioned earlier, they have a variety of options to manage their hearing loss

from doing nothing to non surgical options and surgical options. Patients with single sided deafness all have different motivations. Some want to treat their bothersome tinnitus, some want to understand conversations when somebody's talking on their poor side. And some just want to feel safe or being able to localize and others just want to communicate better in noisy environments.

Patients with single sided deafness tend to use their processors as needed, so they tend to need more counseling and reminders of all day work time. Patients with single sided deafness tend to compare the implant sound to their normal ear, which can be frustrating because if they focus on the negative, they will not be satisfied even if objective performance indicates that they're getting benefits. So when treating patients with single sided deafness, they are unique because of the variability of their desires, reasonings for getting cochlear implant and treatment options. In addition, if they lack the motivation, the patient with single sided deafness can stop wearing the processors and go back to the way they were pre implanted. I'm now going to turn it back over to Dr. Flores as we dive into some case studies that adjust the uniqueness of these patients.

All right, so I'm going to go ahead and get started with my first case. This is a patient of mine and I want to just from the get go make it clear that based on audiogram these patients will not fit the FDA criteria. As you can see from from the the hearing loss in the left side. But it just happened that they had been diagnosed with a vestibular schwannoma in that left side. The patient's surgeon had already planned a concurrent trans labyrinthine surgery to remove the tumor and proceed with a cochlear implant.

When I met this patient he said he had significant tinnitus and dizziness and patient really did feel ready to move forward with the implant, especially because the tumor removal will result in a total loss of hearing in that side. The patient had been suffering with this hearing loss for over a year and definitely, as I mentioned, was ready. So for the cochlear evaluation I assessed, as Dr. Evans mentioned, our typical protocol, the CNC words, NAC biosentences definitely again were incredibly high. It technically

did not meet the FDA criteria. But remember what we discussed about considering the whole patient approach?

Again, patient is highly motivated and they are going to lose that hearing the moment that the surgeon removes the tumor. So I did make it a little tricky. But I do want to prepare you if you have a case like mine, what to do. I did assess patients overall satisfaction in what we call in our clinic Everyday listening conditions is a very short questionnaire. And you can see patient overall was not the happiest.

Overall was mostly neutral. But what was the main problem for this one was background noise which is why they wanted to move forward with the cochlear implant. So there was a special way I had to write a report and I want to share these with you if again you come across it. So you're very prepared. It is pretty lengthy.

You can definitely take a screenshot or look at the slides after the presentation. But I do want to point out the key wording mainly was the statement I said where the patient's surgery which is that translabry and tumor resection in that left ear will likely result in complete loss of hearing and therefore will likely meet. So single sided deafness candidacy for a cochlear implant requiring that PTA to be worse than 80 decibels and the CNC were to be worse than 5 and normal hearing in the other ear which we already had. So I know it might be a little daunting but if you have the patient status, motivation and the surgeon support, it can get approved especially in this type of cases, as I mentioned, where patient was going to lose hearing immediately after the tumor was removed. But counseling was essential.

And again, I know we know that we are a broken cd but it is very important that you share, especially in this population, realistic expectations. As mentioned, patients often compare their normal hearing side with a cochlear one. It is essential that you tell the patients, and that's what we always do, that normal hearing side will never really compare to that cochlear implant ear. Even though the cochlear implant side will most likely help that patient hear and even understand it will not be natural hearing. So it is

very important that we disclose that from the get go.

And obviously they are motivated to move forward so they can actually wear it and benefit from it. The importance of oral rehabilitation again is key. I discussed with this patient the importance of doing streaming, of reading out loud or practicing in both quiet any noise so both ears can assimilate to one another. I usually like to compare the oral rehabilitation with doing weight work in the gym. And I compare their poor side like a arm, like an arm or a leg that has been limp for X amount of years.

So again this is when it's important to note that residual hearing and the use of hearing aid that they might have if they had some use of that other ear then it might not be completely lost from right. It might not be as limp, but it Will still take effort to go from a limp or weak side to a strong one with an implant. So it is important that they exercise it. Just like when you go to a gym, you have to work out your your body and that's the only way that we can grow muscle. So I definitely explained to this patient that that need.

But I encourage them since the patient in this case has really good residual hearing. That does make it a little promising when it comes to the CI. But again I will still stay in caution and again provide realistic expectations. Since every patient is different, it is important as mentioned to connect patients with an engagement manager or a volunteer. I find that again in this population is key.

Not every patient like them may know someone with their condition with normal hearing from one side and hearing loss in the other. So it is really nice when we can help the patient have a support group and as well as discussing the insurance issues that they may or may not have. So as with this first case I mentioned, there had to be a special report written and the surgeon had to do a pre auth letter. And in some cases this can even have the need to do an appeal if it gets denied. So it's important that the patient knows again this from the get go so you can better prepare them.

And in this patient's case again it was very essential that I explained to them because of their medical history they have a vestibular schwannoma. There is also a risk in this one's case that they might not hear after the CI but either way they were going to lose that hearing. So I do find that most of these patients with a tumor, they have pretty low expectations and they just wish for the best. This was again this patient's case. They knew the expectations and they moved forward with a cochlear implant post op.

These are the results. I do want to just give you guys a little reminder of the pre op. Even before the tumor had been removed, the words and the sentences were not really this good. Three months, the patient's word score went from 60% to 96. And again this is with the good ear properly masked and the sentences went from 88% pre op to 98%.

Now do note that patients data logging was less than 10 hours. In our clinic we typically try to push our patients to wear it as much as possible. The Recommendation is usually 10 to 12 hours. So I tried to counsel patient a lot and I have continued to remind them the importance of wear time and oral rehabilitation. At six months when I saw this patient, patient still was Very satisfied.

However, at this point they had stopped doing their oral rehabilitation. And I think this is when the score started to drop a little again. We still see benefit, but this is why we really are wanting to hammer the importance of oral rehabilitation again in this population. We find that a lot of patients try to continue using their normal hearing side, right, because it's, as I mentioned, natural and better. But that might make it so they are ignoring the CI over time and then they lose some of that strength or that muscle that they built because they stopped doing the oral rehabilitation or the exercises.

So in this patient's case, I did counsel heavily on that as well. I do want to note the hearing satisfaction condition questionnaire that we provided and significant improvement overall. As we can see, the main concern which was noise went from dissatisfied to satisfied, which I think is definitely a win. Now note

that the talking on telephone was neutral. And the reason why in this patient's case was that as I mentioned, this one prefer to hear the phone over the natural or normal ear, which again is fine.

But I will encourage this patient, and that's what I ended up doing, to try to at least exercise with the phone, not necessarily talk on the phone, but at least exercise so we can improve overall sound quality and speech. I assess this patient remotely and this is another piece of advice that I will share for everybody to have. It's very nice when we are able to assess in this remote way. Since they are solely going to respond through the cochlear implant ear, there is no way that that normal side is hearing because the sound is being sent through Bluetooth and that streaming can again assure us that that what we are getting is accurate. It's also nice to just compare it to what we get in the booth.

So this patient had completed a baseline one week post activation and then they repeated it again a year post. And the results are as showing or as shown here in the slide. So overall detection thresholds were within normal range. This is very similar to what I also had in the booth. So again that's just another check on my confidence that everything is going well.

Speechy noise was assessed and notice note that there was an improvement in overall signal to noise ratio. And again this is very unique because we can isolate that side and I can feel confident. But time on air lowered and that was one thing that I definitely counsel post op a lot to these one. Specifically I recommend an increase in wear time again up to 12 hours. I really encourage them to do streaming for oral rehabilitation.

And again, this patient preferred to talk on the phone on the good ear. And again, I respect that and I understand. But when it comes to therapy, at least 30 minutes to an hour, if they can, will be ideal so we can get better hearing, better performance, and overall improvement satisfaction. There are hearing therapy books available. Sometimes the manufacturer will provide it.

They can even find it on their own or, or even online. I just recommend that they also read out loud, not only the streaming, because at the end of the day we need both sides to hear and they are going to be out there hearing through both. So they also need to get used to hearing with the implant and the good ear together. I usually recommend, when it comes to noise in the background, to also practice reading out loud with noise presence. So you can do it.

They can do it with just turning the television on, having that noise in the background, and then reading out loud. So that way they can concentrate on what they're reading out loud and ignoring the noise in the background at the same time. So that way they are using both pathways of their natural hearing side and the CI to work together to hopefully suppress noise as much as possible and pay a little bit more attention, which is something that they do need to work on. There's obviously accessories because it is very challenging to pay attention. Right.

It does require effort. And the mini microphone, the Roger pen. Accessories like these can definitely help in noisy situations. So this patient, once I canceled after that remote check, they reported an improvement after using it, which was great. This is my second case.

Now, this is a little bit more normal in the sense that they technically could fit the audiogram that the FDA will be looking for because we have the normal hearing side and then a severe to profound hearing loss or 80 DB PDA or worse. On the other side, patient had very disruptive tinnitus as well. This one's case was Southern. It was a Southern etiology. And they had a shorter duration of hearing loss compared to my other case.

It was just four months from the time that I saw them. And they were very frustrated. They had already tried steroids to treat the sick, the hearing loss. And unfortunately there was no benefit with hearing aid or CROs and like many others, had difficulty in noise and localization. For the evaluation, we thankfully met the CNC word criteria, which was again a reminder, 5% or worse.

So in this one it was 4, which was great, even if the sentences were a little bit better. Again, what we're looking for are those words and they were meeting that criteria. So I do just want to, before I move on, point out that this patient, like the other was concerned about hearing a noise. So that's what I will want to look for and what we'll focus on for the next slides as well. As the other patient I counseled just the same.

Obviously this case didn't have the medical issue of tumor, but I still want to obviously go over their whole history. I discussed the benefit again that they had where the duration of hearing was a bit lower. It had not been years and years where they didn't hear. So that gives me hope that it will be a little bit easier for them to get used to. An implant, however, is again very important that despite everything you still provide realistic expectations and some it is hard to predict how a patient will react with abnormal hearing side and the implant.

This patient connected with a volunteer and that honestly helped them a lot throughout the way. These were the aided scores post op and again there was a significant improvement note, data logging improved a lot and I was super happy and proud that they heard my recommendations. From three months they went from 9 hours 0.6 to 14 hours. And you can see in their CNC words and sentences improving a lot. So at 12 months we're already at 78% and 80%.

And just to remind you, the pre op was 4% with the words so great improvement, patient was pretty happy. And with the sentences we again went from 20% pre op to 80%. And the satisfaction questionnaire showed me that patient felt a little bit more neutral, not dissatisfied, which is great when it comes to noise and everything else. Overall was pretty, pretty good. Like my other patient, this one also relied more on their normal hearing size for the phone, which is why they put neutral on the questionnaire, which again, it is another thing that I counsel for, just like with the other one, the importance of streaming for for better understanding with the implant and the rehabilitation in noise to

improve that concern.

Edit remote check was done two months after activation in this case and I showed very similar test scores from what I saw in the clinic. So again, just a reminder, this is a great way of just making sure that what you see in the booth is accurate. And I did recommend the use of accessories. This patient had, like I mentioned, not being super happy, more neutral when it comes to noise. So I reminded them of the use of accessories, oral rehabilitation and reminded this one that it does take a lot of effort to hear right because they are using both normal hearing and an implant which it is hard to get used to.

And it is normal in my opinion to have an increased effort because there are very different ways of hearing. But over time this can improve. I mean this patient's case, it did. I did do some extra things. I want to point out there's not a lot of time to go over specifically what I did in terms of programming.

But I do want to just mention that I did change the frequency allocation table for this one to improve the sound quality as there has been a lot of research out there to show the benefits in this population when it comes to changing the fat and doing this advanced programming. And I also provided different ways for the patient to access sound. This one had cochlear so they could have both scan to forward Focus scan, scan, 2 no focus and a no noise filter program so they can choose when to have access to everything like their other ear and when they will have extra help by having the microphone be a little bit more directional. So now I'm going to go ahead and move Forward and let Dr. Evans go over some of his cases of his own. I'm going to hand it over.

All right, thank you. So my first case I want to share with you. You can see from the audiogram is a traditional SSD case, single sided deafening case. The left ear is normal. Right ear has a profound sensory neural hearing loss.

For this individual. She was deaf in the right ear for 10 years, part of her case history. She did utilize cross urinase for a few years but she was not very satisfied with it of the need to ask for multiple repetitions. And she still felt that she did all the listening and communication with her normal left ear. The CI evaluation was performed at another facility and the results show that she did meet the FDA criteria for that not only with the audiogram, but scoring less than 5%.

So in this case 0% and CNC words for that right ear.

So for her CI hearing journey, her cochlear implanted hearing journey. So I first met her when she came in for her initial activation. So I wasn't sure about what type of counseling she has received. So at that time we spend a lot of time at that appointment counseling on realistic expectations and once we were done being on the same page because she was not counseled at all appropriately for it, progressive maps were created for her comfort. We brought her back in one month and she is wearing the device more than a recommended time frame.

So 13 and a half hours. Kudos to her and her. Her feedback was actually extremely positive. She was able to understand speech after two weeks and then. But her rehabilitation she said she primarily using the TV streamer, so sending sounds directly to that implanted ear.

So at the three months post activation, you can see how her CNC words went from 0% pre op to 66% at three months. However, during this time she was complaining that it was hard to understand speech in noisy environments. But she was very pleased with her ability to understand TV using a TV streamer. When she came back at six months, she pretty much complained that all speech had a cartoon sound quality.

She still struggled in noisy environments. So I did do some mapping at this time despite her good performance to help with all of her overall satisfaction and to reduce discomfort.

So I had her come back at her seven month appointment. I'm sorry, not in person. We did the remote appointments for her and as you can see her audiogram, we were able to isolate that right ear that was normal speech and noise looked really good. And she's still continuing to wear the device all day long even though most of her time spent. You can't see it here, but it's mostly spent listening to the TV streamer.

So everything looked really good. Objectively, I'm very happy with what I see. However, she did have, there's a section where they can provide feedback and she said that every sound is accompanied by static. Voices are high pitched in the cochlear ear. These sounds do not match what my hearing ear hears, making it hard to decipher sounds.

So with that feedback, despite the positive scores, she is very dissatisfied and she's just ready to give up wearing the cochlear implant.

So she came back at one year. At this time, she still continues to be frustrated. She complained that all background noises like the air conditioner were too loud. There's abnormal static sounds all the time. All speech had a cartoon sound quality and she struggled in noisy environments.

So a lot of her everyday listening conditions she struggled quite a bit. However, when I put her into the booth at this time, her CNC scores were still stable at 62%. To remember beforehand, she wasn't understanding any CNC words. And then with the sentences we're up to 83% and again we are masking the normal hearing ear. And you know, she's still wearing the device every day.

So despite her frustrations, she's still wearing her cochlear implant every day.

So I had her come back a few months later after making some adjustments and you know, she still feels like the processor is picking up every little bit of noise. Still cartoon high pitch. She's actually getting more and more miserable wearing the processor. However, she is still overwhelmingly pleased at her ability to understand speech when watching Television with the TV streamer. So at this time, I encourage you to use the remote mic.

We demonstrated using that microphone in the office. And she was actually pleased that she was able to understand speech for the first time, like a natural voice that wasn't from the TV streamer. So she continues to be optimistic with her hearing journey.

So, in summary, for this case, her reminder, her duration of deafness was 10 years. So she's right on the cusp of that duration of deafness and neurosynapsis. We her booth testing supported optimal benefits with the cochlear implant. So if I focus on the objective testing everything, I would think she'd be doing great. She had positive feedback about understanding speech and using a TV streamer or when using TV streamer, however, her everyday listening situation, she was just very dissatisfied.

There was a lot of ambient sounds that are bothersome, and she was ready to give up. I did do mapping at every appointment, primarily with the mindset that, you know, it could help with her motivation and with her wearing the processor.

So. And the other thing I wanted to mention about the previous case is that sometimes I just don't know what takes in more weight, whether it's the objective measures or subjective measures. So for this case, this is a young kid. Again, here's the audiogram over here. The right ear is normal.

Left ear has a profound sensorineural hearing loss. He failed his newborn hearing screen aided with hearing aids at seven months, and his parents were noticing that he struggled with localizing sounds, so they wanted to move forward with the cochlear implant room.

So for the evaluation, the child and the parents came to the cochlear hearing center in 2024. After a good case, they were referred for a BAHA. But after a good case history, we discussed cochlear implants, and it was determined that he was a good candidate for the cochlear implant. So the parent, both the parents and the child were counseled on anticipated benefits and challenges.

So at the activation appointment, the child complained about loud buzzing sounds that were uncomfortable. I did want to mention with the counseling that with this kid, I used the strategy of games, you know, because he was complaining about the loud noises. So I would ask, you know, hey, do you play games? What do you like? I'm pretty sure you said you like playing Fortnite.

And I asked, hey, when you first started playing, was it easy or hard? He was like, oh, it was pretty hard. And when you continue wearing it, was it. Did it get easier or continue playing? Did it get easier?

He's like, yeah, it got easier. So I used that analogy to kind of help with adapting to the cochlear implant and the buzzing noises that he heard to kind of help him move forward.

So he left the office at the activation feeling well about that. And then when they came back at the one month appointment, the kids said he likes wearing it at school. The parents did admit that he takes some listening breaks at home. He loves wearing his devices. And the parents felt that story time has improved when they were doing reading at nighttime or bedtime.

The data log shows that he was wearing it 11 hours per day. We did some mapping at the one month appointment. He initially complained that the sounds were too loud, but he adapted at three months. He loves his new way of hearing, but unfortunately he's around, kids are kids and kids were making fun of him for wearing his equipment or having his equipment. He also enjoyed taking listening breaks which I wasn't going to get mad at.

Listening breaks are good and you know, as we continue working together, he does love wearing his processor and he does take ownership of his equipment.

So testing wise for these kids. The audiogram aided audiogram looked really, really, really good for him, showing some benefits. However, he's not necessarily getting any speech benefit from the device. So whenever I'm isolating, masking the normal ear and testing just the implanted ear, he's still having trouble understanding speech. But as you see from the data logging, he is wearing the devices on average roughly about 10 to 11 hours per day.

So for this kiddo, in summary, he loves his cochlear implants. It's part of his everyday listening. He loves interacting, going out, hearing a noise, listening to music like he enjoys wearing it. And the parents, they're also noticing subjective improvements as well. However, when I'm in the booth doing some testing, it's showing that he's not really getting much in terms of speech understanding.

So again, what carries more weight, subjective or objective measures? That's for another discussion not to have today something to think about. So but overall the counseling aspect of things is very powerful.

Okay, very good. And I'm just going to end very quickly with just some resources. We mentioned the MSTB3. This all will be available for everybody. At the end we mentioned remote check the different resources, especially the engagement manager or just connection for volunteers is essential.

And finally use considerations to prevent these patients from not using their CI. So it's very important that during the evaluation we assess patient's motivation, we emphasize oral rehabilitation and that we offer these type of resources as we talked, there are measurable benefits with cochlear implants. It may look different from one person to another, and we just need to again, counsel patients appropriately. So

they are very prepared, but they know that there is hope. And while insurance may seem daunting, remember, there are proactive ways, either with pre odds appeals wording in the reports that can help open the door to coverage.

We again, are at the cochlear hearing centers, I mean, bel Air and Dr. Evans in San Antonio. We work with patients with cochlear implants every day. And we are very thankful for you to be present today and for anybody that will watch us later on. This is our contact information and thank you for attending. Now we'll open the floor for any last minute questions.

Thank you very much, Marianne. I'm keeping an eye on the Q and A and I'm not really seeing anything coming through. I know a couple of questions were already addressed. So since I do not see any other questions coming through, I want to take this time to thank everybody for attending and your attention today. And I hope everyone has a great afternoon.

Thank you, everybody. We might stay just a few more minutes if anybody has any, again, last minute questions, but we are done. And thank you again.