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Make a Connection: Integrating Assistive Devices to Increase the Hearing Aid Wearer's Success

Presenter: Michele Hurley, AuD, FAAA

Hello everyone, and welcome to making a connection integrating assistive devices to increase the hearing aid wearer's success. I am your host for today's session, Doctor Michele Hurley, and I'm a senior education training audiologist with Starkey and I look forward to spending the next hour with you talking about a topic that I think is one that has a lot of value for our hearing aid patients and those who are challenged in a variety of listening environments.

Let's do a little housekeeping before we get started. If you do have a question, please use the Q and a area, type your question in and hit send, and I will be reviewing and answering questions at the end of the session. So know that if I don't answer that immediately, we will be covering that at the end of the session. There are resources as you are aware of. You have a handout for today's course that is available in the chat area.

It's also available on your website through ao. You do have the ability to access captions if that would be beneficial for you. Simply click show captions and CC button if you are wanting to obtain the 1 hour of CEU continuing education credit. After the webinar, you'll go to your pending courses and be able to answer the multi multiple choice questions and that will allow you to obtain that CEU if you are a member of the audiology online membership. So that is something that will be required to be able to obtain the continuing education credit for today's session.

If you have any technical difficulties at all, please contact the audiology online at 866782 excuse me, 9924 or email customer service audiologyonline.com or use that Q and a area as well.

Before we get started, I want to talk about what the outcome is that we would anticipate after you complete the course. After you complete the course, we would anticipate participants will be able to list two benefits of telecoil use, identify three use

cases for remote microphone technology, and list two speech and noise tests to assess speech understanding and noise.

Before we get started, I will let you know that we are going to be having some interactive opportunities throughout the session and so you will have an opportunity before each of those to join via the QR code or Slido.com with the information that you see here in terms of the classroom number and passcode. So you'll be using your smartphones to be able to provide those answers. All of them are anonymous so nobody is going to know how you answered, but it's a great way to interact and for me to be able to engage with you. So don't worry if you don't get the information right now. This will always precede any of the questions, and you'll have another chance to be able to connect with Slido, to be able to engage in the polls.

When we think about our hearing aids patients, they come to us wanting to be able to help them hear better. And the hearing challenges that drove them to seek help are very different from one individual to the next. As we consider hearing technology that's going to best meet their needs. We really should be looking at this person from a holistic approach, viewing their needs from the perspective of what will help them not only hear better, but also hear easier as well.

One of the biggest challenges I think we face when we think about, you know, hearing help is that more recommending hearing aids, you know, in an ideal listening situation or quiet environment, or with a familiar talker, and especially when there's minimal environmental noise, often even those with hearing loss to a wide degree feel that they can manage and do pretty well in those situations, or sometimes they think the problem is others. So there are a lot of individuals that may be experiencing difficulty that is really not apparent when they are in more of those ideal kind of listening scenarios.

Now, I think we all know that that ability is greatly impacted when we have those more challenging listening situations, and that's often where environmental noise competes with the desired speech signal.

We know that there's, you know, more challenging environments when noise is present, when maybe there's multiple talkers who are unfamiliar to us. And, you know, when there's a situation or a location that's novel to us as well. Often that pace of communication or even activity is ramped up. And so that makes it even more challenging for us when all those variables are present. These types of scenarios are often where those communication breakdowns begin to occur, and they create that salient moment that often encourages that individual to seek help in the first place.

We also know as well that as we age, these challenges become even more difficult for us to overcome.

For some individuals, the assistance of other technologies that are going to augment the benefit of hearing aids or assist and making that hearing aid wearer's life easier can really optimize that hearing experience. And really, isn't that our goal as hearing professionals?

So what we're going to be talking about today is how we can really think about expanding the usefulness of hearing aids by assistive listening technology. There are other types of assistive tools that are going to be, you know, available in the marketplace. But as you know, the focus of this course, we're really going to be talking about accessories and assistive tools such as smart assistant types of technology, looping telecoils, those types of things that, you know, we can really embrace in regards to hearing aids. So when we think about, you know, captioning and lights and those types of resources, they are available, but they're not going to be part of our discussion Today.

I want to step back for just a moment and see why we should really be concerned with our patients use of assistive listening technologies to begin with. You know, it may seem like kind of a silly question when we think of the capability that hearing AIDS have in Today's world, but when we think about that difficulty in the presence of background noise, that's, of course, the primary complaint that brings people to seek out our services. Of course. But we also know from a fundamental acoustics perspective that assistive listening technology allows us to pick up a target signal close to its source, further away from competing background noise. And it transmits it as well, over a distance while maintaining, maintaining that advantageous signal to noise ratio.

In the case of our patients, when they're attending a lecture or religious service, this can really help in eliminating and amplifying those extraneous noises that are around them and that echo in those types of, you know, spaces very often and that muddle speech clarity due to that reverberation. And we certainly know that, you know, over the last number of years, when we were dealing with the pandemic, the use of physical barriers and PPE made listening, even for those of us with typically, you know, normal hearing sensitivity, all the more challenging. But, you know, when we look beyond that, how can we think about, you know, recommending technology that's going to help our patients truly live the lifestyle that they come to us telling us that they'd like to enjoy. Maybe they've stepped back from, you know, being in a number of these types of environments. You know, that's the lifestyle they'd like to lead, but they've given up on it because of their hearing difficulties.

We're not going to be talking about, you know, health, mental health and cognitive implications of withdrawing from social interactions. But I think we can all appreciate that supporting our patients to communicate better in these types of public situations is a very important element of what we can provide as hearing healthcare providers

that will have a direct correlation and a very positive impact on all of those other health concerns. So let's take a look at a way that we might be able to help that patient realistically benefit from the use of assistive listening devices.

Here's your first slide moment, so I'll give you a second to connect in if you haven't had that opportunity. But the question I'm posing is older listeners need how many more db favorable signal to noise ratio than younger adults on speech and noise tests. Might that answer be two decibels, three decibels, four decibels, or five decibels? So I'll give you all a moment to provide an answer, and then we'll find out what the correct answer is. Looks like there was a lot of, you know, thought that that would be four decibels.

The correct answer is actually three decibels. We find that, you know, when we're looking at. Excuse me, jumped ahead there. When we're dealing with, you know, older listeners, they need that three decibels more favorable signal noise ratio than those younger counterparts on those speech and noise tests. And when we think about speech and noise tests, they're conducted in that ideal listening environment in our offices.

So I think it stands to reason that, you know, that need could even be potentially greater in the real world scenarios that we were kind of talking about just a moment ago, that, you know, add in other variables such as reverberation and, you know, other types of noise that are going to have an even greater impact on these individuals. So when we think about the patients that we typically are dealing with, they come into us with a need for even more of an s and r improvement. So that should factor into how we recommend technology.

The Americans with Disabilities act was adopted in 1990, and it recognized the difficulty that those with a hearing loss were experiencing in public spaces and

workplaces. And it mandates the requirement for assistive listening technology. In 2010, the rules were amended to require hearing aid compatibility so that individuals with hearing aids and cochlear implants need not remove their devices to be able to take part in these types of technologies. So this was a really groundbreaking legislation when we think about, you know, helping so many individuals who have a variety of disabilities. And hearing loss was certainly factored in, in those decisions.

There are a number of ways that that ADA mandated compatibility is available in those public spaces. May take a number of different forms, a hearing or an induction loop. And induction loops are made of copper wire, and they're placed around the room. FM systems, they transmit low power fm frequency radio transmission, and they do that from a sound system to FM receivers. Or there's also infrared systems that work similar to a tv remote control by sending speech or music from a podcast address system to a receiver via an invisible infrared light wave.

So there's a number of different ways in which this is maybe implemented in these public spaces.

First, let's talk about the tools that we, I think, know, you know, well, in relation to hearing aids. You know, they're often found onboard the devices or enabled via programming for compatible aids. Really, when we think about, you know, looping, the advocacy of that actually began about 20 to 30 years ago when doctor David Myers attended a religious service in an 80 zero year old scottish church that was looped. Doctor Myers discovered that, you know, by placing his hearing aids in the t coil mode, the sermon came in directly and crystal clear, even in that ancient church. Looping really was pioneered in Europe, and it remains more widely available there.

But today, there's a lot of advocacy in the United States and a continued push for more public environments to be looped to improve communication for the hearing

impaired individual. And there are a number of, you know, communities that are really highly focused on ensuring that their environment is looped to best take advantage of this type of technology.

When do you think the telecoil was invented? This is certainly not new technology. It was actually patented in Great Britain in 1937. Joseph Poliakov actually developed this patent for a system that was using a magnetic induction coil communication. This is certainly technology that has been around for a while, but it still serves us quite well.

You know, I think when we are considering kind of where we are going with technology such as the introduction of rcast, does that mean that telecoil and loop systems are going to be passe or obsolete in today's digital world? When we think about how people are using landlines. Study in 2022 found that only 29% of homes have a landline, and many businesses are actually piggybacking that off of their Internet connections. So we've definitely seen a move away from the use of landlines, and that certainly, you know, impacts the access to, you know, a coil type of, you know, technology with a phone. But there actually are a number of states that require telecoil with hearing aids, such as Arizona and New York.

And so I think that it's important that, you know, wherever you are, that you're aware of, you know, what is a requirement in your state to ensure that the hearing aid technology meets those standards? And, you know, I think we need to recognize that, you know, sometimes, you know, having a landline can be really, really critical. You know, there was, you know, an instance not that long ago of at and t having a huge outage. And that impacted a lot of individuals from the self perspective. And if they didn't have a landline, they really didn't have a lot of ways to be able to communicate.

So when we think about that in the context of, you know, assistive technology for hearing aids, telecoil and loop systems remains the most proven and effective system

that's available for hearing aids today. Now, I'm sure that's going to change in the not too distant future, but right now, this is the best and most proven solution that we have available.

I think we as professionals, you know, don't even realize the impact that some of these features as looping can provide. You know, I think hearing really is believing. And so, you know, we took our technology out for some tests in places that are often described as being difficult to communicate in, but are also often loose. So I'm going to place some sound files for you in these challenging listening environments.

The first is going to be a comparison in the airport departure hall at the Minneapolis St. Paul International Airport. The first sample that you're going to hear is going to be the hearing, the sound through the hearing aids microphone input. Then the second half will be the hearing aids telecoil input as picked up from the public broadcast through the hearing loop that was installed through that portion of the airport. So you may want to take a minute and, you know, check your volume on your system so you can make sure that you can really get the impact of this audio demonstration.

Here we go.

paging, the party, who recently lost a cell phone in the family restroom in the mall area. Please see the information representative. Pretty noticeable difference, I would say.

This next example, the hearing aid user is actually standing in the baggage claim area of the same airport. And, of course, we would anticipate there's a lot of machine noise generated by the luggage conveyor belts and, you know, a lot of chatter and a lot of things going on. So, you know, listen carefully because you might not even be able to detect that overhead announcement is even happening, especially with the hearing aid. Microphones tend to beg again. Airport police paging Franklin Ruby.

Please respond to gate e six. Echo six. A very noticeable difference. And, you know, I can attest to that particular baggage claim area being always quite busy and loud.

And our final set of recordings, you know, I want to really kind of shift thinking about, you know, the problem of background noise and, you know, implementing the effects of reverberation. I think we can, you know, really appreciate the difficulty that even those with normal hearing have in these types of situations. You know, reverberation seems like kind of a benign thing, but it really, you know, is having a big impact when we are in these large spaces, particularly with high ceilings and hard surfaces. So, you know, individuals with normal hearing often struggle in this type of environment. And that is really exacerbated when we think about those with the hearing loss there and what brings about the unit, as the first reading says, they are bearing witness, and what brings about the unity, as the first reading says, they are bearing witness.

So, again, we can hear, you know, the removal of that impact that that reverberation has, and that can be very helpful. So there's, you know, I think, a lot to be said for the implementation of loop systems and the encouraging our patients to be able to take advantage of these resources that may be readily available in their environment.

So we did a study as well, taking a look at, you know, preferences for using telecoils and particularly in these types of environments. You know, looking at various scenes from movies, capturing a variety of talkers, music from different genres. We had them listen to live speech, as was also spoken in front of them via handheld microphone. And we also then, you know, use the t coil for those types of environments in which that could be beneficial. Tapping into that loop system, we looked at both BTE users with t coil on board the device and CIC users that were using a remote microphone accessory that had a t coil as one of those solutions.

So we did some paired comparison and looked at movie dialogue from the movie Jersey Boys and also a live speech recital of the grandfather's passage.

What we actually found with these paired comparisons, you can see that there was a definite preference, overwhelmingly, for those loop programs over their everyday normal memory program in those types of environments. And we can see that referenced by the larger bars on the left side of the graph, the trend was a little bit stronger for the BTE participants that we see in blue. And I think that is not necessarily surprising when you consider, when you have a more significant hearing loss, you probably see a much greater perceptible benefit from something like that direct t coil input. So, you know, we definitely saw great improvements, and that was even really accelerated when we looked at that BTE participant.

We looked at that from the perspective of perceived listening effort. We can also see that there was a large percentage of participants who reported less effort with the t coil than without. And in fact, that high percentage of 96% of the BTE users experienced less effort using the t Qual versus the hearing aid mics alone, 70% with the CIC users. So I think we, again, saw that relationship of that more significant hearing loss seeing an even greater benefit. And I think that's not really surprising.

I think this is great data that it shows that almost every single individual that participated felt that they had less listening effort with the t coil. And I think, you know, when we think about it, this was probably in even more a favorable listening environment than maybe our patients find in real world. So, you know, I think this is really great information.

What I found, you know, most interesting was really thinking about, you know, did they want to continue using this type of technology going forward? And I think you can see the results of that. You know, this was the case where these individuals, you know, saw

the benefit that they are experiencing and really wanted to continue using that type of technology. And that, I think, will speak as well to what we're going to talk about a little bit later in terms of demonstrating the benefit of these types of features for our patients to understand what's in it for them.

The use of hearing assistance in public spaces can really provide a significant improvement in enhancing communication, and I think we experienced that listening to that study. It's really important that we educate those that come to us for hearing help about the resources that do exist and how to identify and a public space that that hearing assistance is being offered. You know, and here would be an example of what that sign, you know, would let us know that this type of environment is looped and available for hearing assistance. And again, I think demonstrating use and benefit is going to be very valuable, and we'll take a closer look at that in just a few moments.

Despite the incredible benefit of today's hearing aid technologies we talked about earlier on, you know, I think that, you know, digital sound processing and advanced environmental adaptation is doing great work in really increasing that patient satisfaction and allowing us to kind of reach the potential that we've always wanted to with hearing aids. But there are wheres that require additional resources to be able to truly optimize their hearing experience. And that need could be due to a number of factors.

We know that as people age, they start to experience certain limitations. And if we look at research for the United States, by 2040, almost 35 million adults are going to report arthritis, attributable activity limitations, and 40% of adults over the age of 65 are going to report having memory impairment. So accessibility is even more important than ever because we know that that senior population is growing by leaps and bounds every year. So these factors and others such as, you know, loss of visual acuity, cognitive capability, all of that can impact successful hearing aid use. So even with the delivery

of the best sounding hearing aid technology, that overall experience might be impacted by some of these cognitive and physical struggles as they engage with their hearing aids.

So I know we saw this data earlier, but I think it really bears repeating as we think about those considerations for recommending accessories and assistive technologies for our hearing aid wearers.

By doing a detailed discovery of our patients, I think we can really uncover the difficulty that's been motivating them to come in and seek hearing help and ones in which we can provide a solution that's going to deliver that successful experience that we are all striving for as hearing professionals. And we know that they come to us to be able to attain. If we think about how to best address these challenges, we may need to look beyond that hearing aid to provide that best communication experience from the perspective of, you know, all these different types of scenarios. You know, Starkey actually has some accessories that, when paired with our 2.4 GHz hearing aids, offer simple solutions to many challenging environments. And, you know, whether that need is for easier control and adjustment of the hearing aids.

To be able to enjoy watching television with the grandchildren again, or to be able to communicate easily in one on one noisy environments. Accessories offer a simple solution to enhance the patient experience.

Accessories communicate with hearing aids wirelessly. And Bluetooth is that pathway. Yet not all Bluetooth is the same. Starkey is using a proprietary 2.4 GHz protocol to communicate with our family of accessories. And not all manufacturers use the same Bluetooth approach.

So I will be kind of talking about this from the starkey perspective, and there are going to be many, you know, products that have similar capabilities on the market and some that will be different.

So we think about that wireless transmission that has really changed the way in which, you know, we can communicate with technologies, and that's going to continue to, you know, grow and expand in the coming years. So it's really become, you know, such a key part of our technology in the hearing aid industry today. Another term that, you know, we hear a lot, and I'm bet you probably get asked about a lot, is what is streaming. I know I get asked that almost every time I go home and see my dad, you know, I have to remind him every time that when he's watching Netflix on his tablet, he's streaming. It seems like this very, you know, abstract concept, and sometimes that's difficult for individuals to understand, and you know, anytime you're streaming, that's because we're receiving that signal from an electronic source such as our smartphones.

Media such as music or podcasts, or even from hearing aid accessories were streaming. One of the challenges for our industry has been that both Apple and Android have their own proprietary streaming protocols. So communicating between hearing aids and these two families of products has been quite different. And so that, you know, was definitely one of the biggest challenges in the last number of years is providing greater access, especially as it came to Android.

No matter how good a hearing aid is, there are those situations that a patient could use a little extra help. And from the starkey perspective, that's what our Starlink family of 2.4 GHz accessories is designed to do. So we're going to talk a little bit more in depth about these.

And we talked about earlier. Understanding speech and the presence of background noise consistently rises to the top of those challenges that individuals with a hearing loss face and often why they come to see us. And remote microphones have demonstrated significant benefit in enhancing speech understanding in a variety of environments. And Starkey is really pleased to offer a number of remote microphone solutions to meet that patient's specific needs.

Here's another interactive moment. My question to you is, do you conduct speech and noise testing? And, you know, again, this is anonymous, so nobody's going to know how you answered. But I think this is always a very interesting question to pose in the hearing healthcare community.

I think this is a really good view of where we are really as hearing healthcare professionals. It's great to see that the vast majority are doing this sometimes. And so it's definitely being considered. Why I feel like this is so important is because if we're not testing the common complaint that is driving people into our offices for help, we're really not delivering, you know, the best, best services possible to them. We really can't reliably predict their performance in these challenging environments if we're just looking at those audiometric thresholds.

So we should be measuring that most common challenge that brings them to our office. And it can be done very quickly and very reliably. It's often a great tool to help us as we are educating our patients and guiding them to the appropriate help. It really reinforces our recommendations, you know, allows us to really confirm the benefit that hearing aid technology can provide and it truly is best practices. So, you know, I think that it's really important that we maybe step back and think about what we're doing in our practice and how we might be able to incorporate these on a consistent basis if we're not already doing so.

There are a number of speech and noise tests on the marketplace, and so I'm not going to take the time to talk about each one of these, but I am going to highlight those that are probably most commonly used, and that's the QuickSin and the ANL. The ANL, or acceptable noise level test, was designed to measure a patient's tolerance for background noise. That willingness to tolerate background noise is often very directly related to their success with hearing aids. The ANL can be a good predictor of the patient who's going to wear their hearing aids and can really help us validate the need for noise reduction technology, directional microphones, remote microphones, and additional counseling. So this is something that really gives us a lot of good information to be able to support our recommendations, and it can be completed in three minutes.

This test is available through fry electronics. When we look at the scoring of it, there's either a low ANL score or a high ANL score. And when we see the low ANL, that's a person who's pretty noise tolerant. You know, they are willing to kind of tough it out even in the most challenging of environments where that signal to ratio is pretty poor. You know, the signal noise ratio, they're likely going to be a successful hearing aid wearer, because, you know, they're pretty laid back and can kind of go with the flow when it comes to background noise.

And it's good for us to, of course, deliver technology that is very focused on speech intelligibility and maybe consider the benefit that directional and remote microphones can actually provide to really elevate their success. When we look at the high ANL, this is a person who has a low tolerance for background noise. They, you know, kind of require everything to be ideal when it comes to the signal to noise ratio to be able to really listen. And, you know, they're going to probably be a little bit more of a challenge when it comes to hearing aid success. But that doesn't mean that that's not possible.

It means we need to be thinking about how we're educating this patient, you know, providing those resources like directional microphones, remote microphones, more

advanced noise reduction technology, guiding them toward these assistive types of technologies, especially in public spaces that they can really interact with to help them in these types of environments. So, you know, there's no reason why we can't fit this individual successfully, but it may incorporate some of the technologies that we're talking about today. To be able to effectively do that. And I think we all know individuals who are just more tolerant and less tolerant in general. And, you know, that type of personality can certainly play a key role in somebody's success and willingness to kind of tough it out in these challenging environments.

So, you know, as we think about the ANL and how we might apply that, it's going to play a key role in our technology recommendations. Especially, you know, with the high ANL where we have that intolerance, we're going to really need to be stressing and demonstrating the benefit of these features and what it's going to mean to them in terms of their performance and their enjoyment of being in these types of environments that are more challenging.

The other test that I think is most commonly used is the quicksand test, and this is available through etymotic. And, you know, it's a easy, quick way, about five minutes to be able to perform this test, to be able to, you know, get a better sense of quantifying all of these things. We've been kind of talking about the need for hearing aids, the needs for, you know, newer technology that is more advanced in terms of being able to manage noise and the challenging world around them, consideration for other tools such as directional microphones and remote microphones. So again, it gives us some great data to be able to support our recommendations. The way the Kwik sen is scored is classifying the data by a SNR loss rating.

And that low number is going to be somebody that, you know, does pretty well in those types of situations. Even if, you know, they, you know, are dealing with a hearing loss sometimes they do pretty darn well. They can fight through that noise and, you know,

really manage that type of situation. But as we get into a SNR of seven to 15 decibels, we're seeing somebody that, you know, was really struggling in that type of context. And things like directional microphones can be really beneficial.

Laboratory tests have indicated that directional microphones can improve that signal noise ratio in terms of just our regular testing and speech intelligibility by about one to six decibels. For individuals using hearing aids, that is dependent on a number of factors, such as the hearing loss, venting, etcetera. So there are variables that will impact that. But we know directional microphones can provide great benefit when we look at an SNR score from the Kwiksin that exceeds that 15 decibels. This means that we may need to look beyond just directional microphones and consider remote microphones, FM systems, looping and making sure our patient understands how to integrate with those types of technologies for their best capabilities.

Why is it important to have all of this data and be able to quickly and easily gather that? I think the biggest reason is that people don't argue with their own data. It reinforces the need for the technology that we're going to be recommending, and it shows how we can address that most common concern in our practices today. And if that individual was part of that test and, you know, understood how that score was derived, it's much more difficult for them to argue that benefits of the type of technology that is going to give them the best performance in these challenging listening environments.

So when we think about remote microphones, they benefit a number of different use cases. And that can be clipped on the clothing of the speaker of interest. It could be placing it flat on a surface in a challenging environment or simply placing it next to a desired audio source such as a tv speaker. They can really deliver a lot of impact. So there is a lot of benefit to remote microphones, and they offer different types of benefits depending on the different type of remote microphones.

So some are better for purposes than others. So if we look at a use case of a patient that indicates that they're maybe struggling, hearing their spouse when they're dining out or they have difficulty in class and, you know, religious services, those types of things that, you know, not only does that impact, you know, somebody who's younger and still in school, we know there's lifelong learners and individuals who are in these type of social environments that can be really challenging. So what might be the best solution? We think of remote microphones in this case, from the starkey perspective, I would recommend the mini remote microphone. It's designed to stream simply and easily when clipped on the clothing of the individual that we want to focus on.

It can also be placed, you know, kind of in front of, of a tv speaker, for example. But its main use case really is that clip on clothing to be able to provide that immediate benefit for that conversation.

So, you know, again, thinking about use cases, it's a really simple solution for those one on one type of interactions, whether it's quiet or noisy, simply attach it to the companion's clothing, place it close to that desired audio source, and we have that ability to really elevate that performance. Ideally, the mini remote microphone should be within twelve inches of the sound source so, you know, closer to the mouth of the companion or close to that speaker. And, you know, with this in mind, that makes it a little more, you know, challenging when we think about use of it as a tabletop microphone might be less optimal for that type of use case, and it also does not offer bluetooth streaming capability.

We look at some other use cases. That patient who maybe needs assistance when they are in those loop types of environments, maybe they enjoy going to the theater or those types of spaces that are equipped with that type of assistive technology. Maybe it's individuals who are, you know, wanting to be connected to their computer and be

able to use that audio more effectively. And sometimes you have individuals who have very unique needs that go beyond hearing aids, aids. How might we benefit these individuals?

From the starkey perspective, I would highly recommend the remote microphone. Plus, this is the one accessory that truly does it all. It actually has five different, you know, audio sources that are possible. It has the capability to act as a remote microphone, as we would think about it, clipped on the clothing or flat on a surface, and it changes its directional orientation by that positioning. So it has sensor technology.

To determine that it has a Bluetooth capability, we compare it with a phone that is not direct streaming compatible. As a telecoil on board FM system compatibility in the base of it, we can connect a European FM receiver and actually stream it binaurally. And there's also line in connectivity for something that we may want to connect to, like a tv or, you know, MP3 player, for example. So a number of different ways that this device can be used. So it's highly versatile.

So especially for somebody who maybe has different needs at different times, this might be the best option in that regard. When we think about it, you know, from that companion microphone perspective, it's going to perform really great. Again, if you've got somebody who's has one of those older phones that's not direct streaming compatible, this is going to be the best option to incorporate that type of technology.

You know, there are those individuals who, you know, don't have an onboard t coil like that CIC subject segment in that study that I referenced. This is a great way I'll be able to incorporate that. You know, FM systems are utilized certainly in classrooms, but there are other applications being able to plug in that Euroboot and get binaural streaming is a really effective resource. And we also know we have a lot of devices

around that we may want to just line and connect because we can't pair Bluetooth. And this is a great way to be able to accomplish that.

Thinking about some other scenarios, you know, when we have those family gatherings, you know, often that can really be a problem for that individual and cause them to sort of withdraw from those types of environments. And that's really, really sad. You may have somebody that, you know, needs benefit in meeting types of environments. They're constantly in those types of scenarios and having difficulty. Maybe they're, you know, a judge in a courtroom.

You know, those all can be very challenging listening environments that are a real good, you know, use case for the table microphone. The starkey table microphone has eight directional microphones and beam forming that allow it to really enhance listening in a wide variety of challenging listening environments. Obviously, you know, in the name is table, so, really great. When we think about that table top type of performance, and it actually has the capability to either, you know, be able to focus on, you know, automatically the dominant speaker at that moment in time and move automatically amongst the eight different microphones as that conversation changes around the table. It can also be set to focus on one or two speakers manually so that we can, you know, create that specific focus.

Or all eight of those microphones could be in play, if that's appropriate in that type of environment. It also has a number of other use cases that make it incredibly beneficial. You know, it can be worn as a companion microphone because it does ship with a lanyard that allows it to be worn in that use case. Obviously, it is a little bit larger than the other options we discussed, but that does make this a nice secondary use. It can also be physically connected to something with an audio out jack, so we can connect it to tvs and other types of devices.

It also has benefit for non hearing aid wearers and normal hearing individuals who just need more effortless listening in those challenging types of environments. It ships with wired headphones that actually allow it to be utilized very effectively in those types of environments. So it really is a unique accessory in that regard because of its capabilities. When we think about the benefit, we know that directional microphones can be beneficial in remote microphones as well. But that eight directional microphone and beamforming capability, the table microphone really elevates it to provide an incredible level of performance in challenging environments, making it really an effective resource.

So when we think about remote microphones, they offer a tremendous amount of benefit for that patient in a wide variety of environments. And if we can, you know, get our patients to understand what those benefits are, very often it's going to be something that they will be willing to embrace if that's going to give them the experience that they are looking for. When we think about, you know, challenges with watching tv with others, when you have a hearing loss and need to crank that volume up. That's usually not appealing to others with the normal hearing in that environment, and often has been an impact to people's family relationships at home. So what can we do?

We can provide a tv streamer for these individuals that's going to give them that direct audio streaming, but also allow the others in the environment to be able to enjoy that audio very effectively. The beauty of Starkey's Starlink tv streamer is the capability for an unlimited number of wares of our 2.4 GHz technology to be able to be paired with that tv streamer. So it can really be an effective solution when you have multiple individuals in an environment wearing that particular technology, and it gives great sound Quality and range. We know that tv streamers, you know, offer a tremendous amount of benefit. And that's something that, you know, I think, again, can really, you

know, restore some of those family relationships at home that have really kind of separated from the tv watching experience.

And that's very beneficial, I think, for many fans. What about an individual maybe, who's having some dexterity concerns? Or maybe they just need to be able to adjust their hearing aids easily and discreetly, even if they are tech savvy. Sometimes you just need that sort of unseen ability to control your hearing aids well, and a remote microphone allows you to be able to do that. So we have a new Starlink remote microphone that's got a great level of functionality.

You can be used and programmed in a number of different ways for that favorite or star button to be able to activate and stop and start accessory streaming, incorporate our edge mode plus feature, manage the tinnitus response, or even jump to a memory. That maybe is beneficial in certain situations. So it is a great accessory. It is pairable with one set of hearing aids left and right. And when we think about those patients, I know we often think about dexterity as the main use of a remote control, but there are individuals who just need that easier way to be able to manage their devices.

Maybe they can't take their smartphone into the courtroom with them or some type of environment, and this gives them an alternative to be able to effectively control their devices. And this is all, you know, things we can identify with good discovery and we can find the right solution for that patient. So, you know, there's good reasons to think about a remote control. Whether it's dexterity or, you know, other needs, it can have a lot of value.

When we think about accessories, we, I think, recognize that not every patient needs them, especially with the capabilities today's hearing aid technology. But there are those individuals who need that additional assistance and know that there are a lot of great resources for you when it comes to starkey in terms of user manuals, quick tip

guides, and videos to educate on how to use these accessories that can benefit both the professional and the patient.

I think it's very important for us to demonstrate accessories. Somebody's not really going to understand why they maybe need this additional device, why they maybe need to pay extra for this additional device if we don't demonstrate that benefit for them. So, you know, we need to be able to help them discover the specific listening situations that they struggle in, help us direct them on how that accessory could improve those experiences in that type of environment, and demonstrate.

We also know that, you know, patients may be hesitant to consider an accessory for a number of reasons, the additional costs certainly being one, potentially not wanting to carry an additional device. So, you know, how could we provide some communication benefit outside of an accessory? We've talked about a few things such as t coil and tapping into looping in environments. How about incorporating a device that patients probably already have with them, their smartphone? Let's talk briefly about a couple of solutions that might benefit in terms of the starkey hearing aid wear.

One of those features is the technology called voice AI. This is specific to the Genesis AI premium 24 technology level, an individual with hearing thresholds that are 50 decibels and worse at 255 hundred and also fit binaurally. They also must be an Apple user because this is exclusive to Apple iOS, something that is not as effective with Android devices because of the audio delay being a little bit more objectionable. This feature actually taps into the microphone on the base of the smartphone itself and is a feature that is accessible when all of those criteria have been met in our, my starkey app. So it allows that patient to use their smartphone as a remote microphone.

And we know that Apple devices have that capability with live listen, but with voice AI, it allows us two options that you can see here, regular and enhanced. Regular is really

kind of utilizing that live listen protocol that Apple has developed, but bypassing the low pass filter that they've imposed. Enhanced is actually tapping into a proprietary voice AI algorithm using machine learning and deep neural network AI that allows us to deliver an enhanced signal that really optimizes that for the hearing aid wear. They can access this on an as needed basis if all that fitting criteria has been met. And they use their remote mic, their smartphone as a remote microphone, transcribe, and being able to have that closed captioning is a great feature that's available in the my Starkey app that allows, with a simple tap of that microphone, the ability to transcribe and gain that visual modality to support that auditory.

The transcription can actually be saved to a file, it can be emailed, can be shared via text. And so this is a great way for us to, again, provide two modalities that can provide the patient the best benefit.

I really think that, you know, hearing is believing, and hopefully that's something that you experienced when I was playing those audio files and those challenging listening environments that were looped and really got the benefit of that type of technology. We need to have that same sort of thought process with our patients. They're not going to understand the importance of it if we don't demonstrate it for them. We actually, as part of our study, took a look at that. We were looking at that demonstration concept and usability.

Did that encourage the patients to utilize these technologies more? And this was done with the same form factors of hearing aids we talked about earlier, that CIC that was paired with a remote microphone plus to tap into that t quail feature, the BTE that had the onboard t coil. And this was a power plus BTE. So individuals with pretty significant hearing loss. So what we did was we, you know, took the look at the two different types of participant groups, those that did not get an actual demonstration of the assistive technologies.

They got counseling about, you know, how to use their devices, and they were shown what an ADA assistability sign would look like so they could recognize that in public spaces. The second group got the demonstration, so they got the same sort of, you know, education that the no demo group got in terms of verbal counseling, ADA signage awareness. But they also got to experience a looped demo, and they were able to practice that looping program and how they would utilize that themselves when they are in these types of environments. And they were also given a list of local loops available in their space so they could try it on their own.

And when we brought them back a month later, we were asking them a number of questions. Do you recall talking about the t coil? Do you recall what the loop program actually does? And do you recall how to access that loop program?

And what we found was, you know, a huge difference between those that received that telecoil demo and those that didn't in terms of recalling it, recalling how to access it. So, you know, definitely a big difference there. So I think this really shows us, you know, and demonstrates, if you will, the benefit of a demonstration and making sure that that information is available for them. We know that, you know, we retain a very small amount of what we hear and a much larger amount of what we see. And so being able to combine those elements again, I think, is really effective.

So how might we demonstrate, you know, telecoil performance in our office? It could be as simple as having your patient dial an automated weather recording, or having a conversation with a loved one or even your front office staff over the phone. In terms of demonstrating looping, obviously, that can seem, you know, a little challenging in many of our spaces, but there is some examples of loop systems that are more sort of portable, if you will. And I just pulled in an example of one of those that would, I think, be a really great office demonstration tool with the added benefit of aiding

communication for the hearing aid wearers in the office with this loop compatible technology and their hearing aids that have that as well. So this is just an example from William Sound that is priced at dollar 325.

So, certainly something that, you know, might be in the realm of possibility and could really provide a great benefit as your front office and in that waiting area.

So when we think about devastating accessories, there's ways that we can make that pretty easy and seamless. Have all your accessories ready to demo, have them charged, have them paired to a set of demo devices, or easily ready to be able to pair with the individual's hearing aids, maybe their own, or the ones you're demonstrating for them. Have that team streamer connected to a tv in the office, or maybe have a tablet that you can use to easily demonstrate tv content. Tablets and tvs are relatively inexpensive. In fact, tablets may be more expensive than tvs in many cases these days.

So it's easy to have that technology, even just tapping into your computer, to be able to demonstrate that kind of, you know, content. Wear the remote microphone plus or the mini remote mic on your lapel at all times. This may prompt questions and allow you again to easily and demo, really target that demo to the patient's needs. They all are going to have different needs, and so we need to be prepared to be able to incorporate what's meaningful for that particular individual. We also should really get that companion participating in the demo, have them wear that remote microphone and carry on a conversation, maybe moving further away in the office so that they can see that benefit.

And, you know, that was probably going to make the patient light up, and it certainly is going to make that companion light up with the possibilities of knowing the benefit that's provide in their real world. We think about streaming tv, you want to set it at a comfortable volume level. So maybe that hearing aid wearer can enjoy it as well as the

individual that you're demonstrating with. So there's a lot of easy ways that we can think about making this something that is very possible during our busy days. So how might we set ourselves up for success and our patients?

When we think about assistive technology, I really like the keep it simple type of concept. We want to make it simple for our patients. We don't want to tell them about every feature that a hearing aid does and every accessory that is possible to assist them with a wide variety of things. But as they're starting on their wellness journey, I think we need to start first and foremost with delivering better hearing. And then, because we've done a great discovery, we've identified these needs, we can then tie in these other technologies, whether it's accessories, features that are possible via the smartphone, other types of assistive technologies outside of that that might benefit this patient, we can actually allow them to start to ease into these things.

I think that'll help in terms of that patient's long term success because we didn't dump a lot of information on them. What's very important, I think, is that practice aspect. And we saw that in that study where those individuals that were educated demos and practice doing something, we're much more effective at utilizing that technology and remembering all of the details about it. So, you know, that show one, do one is really, really important. Not only showing the patient how to use that technology, but making that demonstrate that back to you reinforces that that knowledge.

The same is true with our companions. We need to tap into them and make sure they understand how to use it, especially if they play a key role in that patient's need and usage of this technology. Or maybe they're, you know, really their support system, you know, around the house. We also need to allow our patients to know who they need to contact for help. That may be somebody in your office, it may be something like the tech support with the manufacturer that's focused on consumer support.

So make sure they know those resources, just as we gave those that were demoed a list of where to find looped environments in their, you know, their community communities that can be really valuable information to provide for them as well. So, you know, I think it's really important that we take a look at what our environment can do in supporting this type of need and making sure the patients know where to find those resources. Great, great little, you know, project for somebody to build up that document so that you can provide that simple but very, I think, valuable resource for your patients.

You know, we've talked about, you know, a number of different assistive types of technologies that are available in the here and now. What might the future hold as we think about assistive technology, the way, you know, technology changes so rapidly? I know that there's changes, you know, very soon on the horizon, and one of those is Oracast. You know, the industry is really learning about the future of connectivity with RCast, which allows audio to be broadcast to an unlimited number of compatible devices. This overcomes the one on one limitation of a traditional bluetooth as we know it today.

Oracast is going to allow hearing aid wearers to be able to connect seamlessly wherever that technology is available. But that transition is going to take time, and I'm not going to be talking any further about our cast at this point in time, but know that details about that are going to continue to be ongoing in our industry, and certainly from starkey in particular. So this is definitely a direction that we are going that is going to have a huge impact on assistive technology as we know it. But it, again, is going to take time. And so we need to be versed and able to provide the resources in the here and now that we currently have.

So as we think about assistive devices and kind of summarizing our time together today, we saw that there is a lot of benefit in the use of these through the audio

demonstrations that we heard. And if we think about how we can simplify that process, process, demonstrate to our patients the benefit and allow them to understand how they can use this technology to their best success to make sure they have the most successful hearing aid experience. I think this is something that's really important for our patients and something for us to consider as professionals. So as we wrap up our time today, I've got just a final slide for us. I'd love for you to share your takeaway from today's session.

What was something that really kind of caught your attention as we were talking about the benefits of assistive technology? I'm going to give you a few moments to kind of share with us. I think it's always really helpful for me to see that information. I really appreciate everybody taking the time to join me today. This is a topic that I find very, very interesting.

You know, today's hearing aid technology is so amazing, but there are those individuals who need that extra assistance, and really having that capability can be something that's so important for them. So I want to thank you so much for your time today. Appreciate you joining me and I will look forward to seeing you at another audiology online event in the near future. Again, if you've got any questions, I will be happy to review those and provide answers.