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Presenter: Catherine Palmer, PhD; Brian Taylor, AuD; Catherine Richardson, MA; Dave Fabry, PhD; John Pumford, AuD; Laurel Christensen, PhD; Randy Baldwin; Shannon Basham, AuD; Steve DeMari, MS

- So welcome everybody. It's great to have you here. I wanna just introduce who's on the panel today. We have Steve DeMari from CaptionCall, Randy Baldwin from CareCredit, Laurel Christensen from GN ReSound, Brian Taylor from WS Audiology, Dave Fabry from Starkey, John Pumford from Audioscan, and Shannon Basham from Phonak, Catherine Richardson from Cochlear Corporations. So we have quite a group with lots to tell you about today and we're gonna jump right into that. We have a bunch of disclosures. You can see this. This is part of the handouts, so you can review this in detail. And in terms of learning outcomes, really focused on individualized patient care this year for the panel. And each of our presenters are gonna talk specifically about their products, technologies, or services that really address individualized care and support audiologists in terms of being able to provide this kind of care.

So we're gonna start with a polling question. We have three of these today. So while you're answering this, I'll introduce you a little bit more to our format. But the question being accessing industry partners to support my work with patients is A, critical to me, B, nice, but not critical, C, not necessarily, I can Google that information that I need, or it's important, but I'm still on hold. That may be a reflection of some of my more recent interactions. So go ahead and give that some thought and give us some answers. So last year, we focused on increasing access when we did this panel. And this year, as I said, we're really focused on individualized patient care.

As we've seen the advent of OTCs and a lot of focus on self-care, what audiologists really bring to the table is that individualized care, and we certainly partner with our industry colleagues to provide that kind of care, which is what we'll hear about today. So they'll be answering two questions. Everybody on the panel will answer two questions that we've post, that came from interviewing other audiologists and finding out what would people like to hear about. And then each panelist was able to come up with a question they'd actually like to answer. That's something we've done for the last few years. So we get some insight into what they'd like to talk about, and then we'll

learn a fun fact about each of our presenters, which is always nice to think of them in what they're doing maybe when they're not at work.

So we'll look at that as well. So that's what our format will be. I'll introduce each question and then introduce each speaker. If you have questions, you were already told, put those in the Q&A, and I'll make sure and pick those up and go ahead and ask people either at the end of their segment or at the end of our two hours together, wherever that fits in. So we'll be monitoring those questions. All right, so what we're looking at in our poll is accessing our industry partners, critical to me, literally tied with nice, but not critical. Interesting. So we have people on the phone where that's relationship they are probably using quite often and other people who that's helpful, but they're gonna kind of find a way regardless.

No one said not necessary, I'm not surprised by that. Certainly, these relationships are really important, and a few of you, like me, have been on hold maybe slightly longer than we'd like to be. Certainly not only with our industry partners, that's probably with most things we're navigating these days. All right, so that gives us a nice sense of how people are thinking about things. So the first question we posed, and what we did is we had our industry partners rank the questions they might like to answer and then we sorted through and certainly made a mix of kind of first, second, and third ranking on this. And so then we've a few people answering each of our questions as we go along today.

First question, how does your product, technology, or service, depending on what the person does support the audiologist's ability to provide individualized patient care? And we are gonna start by hearing, sorry Laurel, by hearing from Laurel Christensen.

- Thanks. And thanks to the 42% of you who think we're critical because I think we're probably critical if you want to fit all these instruments as well as you can possibly fit

them. You're also critical to us because your experiences and what you are doing out there is how we learn to make the next products better. So hopefully that relationship is critical in both ways. So as Catherine said, how does the product support the audiologist's ability to provide individualized care? And I think there's probably no better way to do this than to actually let patients here with their own ears. And so I think all of historically, we have moved to a receiver in the ear kind of market, more than almost 80% of the market today, receiver in the ear hearing aids.

So we've pulled the hearing aids outta the ear and we have microphones on top. And of course all manufacturers put some kind of average pinna into those hearing aids so that you do get some ear acoustics. However, you don't really get to hear with your own ears and your own ears are incredibly important. First of all, if you're someone elderly who is aging and has presbycusis, you have listened with your own unique ear acoustics your entire life. So it's no wonder that we put receiver in the ear products on 'em and they go, "Ooh, it sounds weird, it sounds different. It doesn't sound like what I'm used to hearing." And that's because your own ear acoustics are incredibly important.

That's why we do real ear measurements. We all have our own ear acoustics. So we came out, it's been on the market for a while now with M&RIE. This is a microphone and receiver in the ear, so we're putting the microphone back in the ear, right in the receiver housing next to the receiver. So you can bet it was very hard to do it without feedback. But I wanna show you just some of the results. When we started to look at doing the M&RIE receiver, we did a lot of comparisons between our standard pinna corrections. So this is the average pinna that we put into our receiver and your hearing aids versus using your own ear with your M&RIE receiver.

And I just wanna show you what that data looks like. If we ask sound quality ratings of the people using the average pinna, you can see that the ratings are all over the place.

Some people think it sounds great, some people think it's not so great. And if you actually do some measurements on what the average pinna is versus those people who think this sounds natural, their pinna is very close to the average that we're putting into the hearing aid, the acoustics. If you let people listen with their own ears, sound quality is all good. Everybody's used to listening with their own ears, everybody likes it. So the biggest thing that something like a M&RIE or putting that microphone back in the ear can do is, is improve sound quality, but it's not just about sound quality.

And in my little, I don't know, three minutes that I have here, there's no way to go through all of these studies. But suffice it to say the sound quality is better, localization is better on first fitting, localization even gets better after that because you use your ears to localize. This is what you have to have to localize. Listening effort is less, people can use the phone very naturally, they don't have to search for the sweet spot. So listening effort overall, we talk about that a lot. Better speech understanding and noise, because you can sound separate if you have spatial perception and wind noise is incredibly good because there's no wind when the mic is in the ears.

So there's a lot of benefits to doing it. As I said before, not easy to create because feedback with the microphone versus the receiver. So you have to be very careful who you fit a M&RIE receiver too. And it's not for everybody. If the person needs an open fitting, which would be this more dark blue area, you can fit them with a more open dome. The closed dome here has about three to four dB occlusion. It's not like a completely Closed dome and the Tulip dome, but you can't fit someone with thresholds greater than 70 in the high frequencies, or you'll run into some feedback. If the person can take a little bit more closure, closed fitting because they have more low frequency hearing loss on earmold or a power dome, then you can really start to fit some of these high frequencies beyond 70 dB HL.

So the entire fitting range is there, but I kind of highlighted the fitting range for people who have normal lows. But overall, I think there's no better way to personalize a receiver in the ear fitting than if your patient can qualify for a M&RIE. And with all of the benefits I think is probably the biggest personalization we can do today.

- Thanks so much. So yeah, this was a great way to lead off with individualizing, personalizing. Sometimes I debate with myself, which one would be a better word, right, of what we do, but certainly and maybe they're interchangeable and so this is fun. It harkens back to, I hate to say it, my dissertation because, and you've worked with Mead Killion over the years, as did I really looking at these individual characteristics and found exactly the kind of thing you're reporting. Other than people who had really, really strange canals, which is a whole different group of people. But I love seeing these data. So I'm curious in a more pragmatic way what you find in terms of problems with the mic when you have the mic in the canal or have you found problems with that?

- Yeah, you have the same kinds of problems you get in any receiver housing. So wax, of course, it's harder for the wax to get back to the microphone because it's on the back end, but it still gets there eventually. So you see the same kinds of problems. Do we see people having to change these out more often? Not really. We're not seeing that. We see the receiver again get plugged or go dead before the microphone on these, so quality issues really haven't been any different than our standard receiver housings. It was definitely a question we had for a long time. I think the biggest challenge having launched it was, and that's why I say the relationships that we have with people out there every day fitting are so critical because I think when we launched it, we had a pretty good idea of what the fitting range was, but when you fit thousands of people, you just learn so much more.

And so now we know exactly what the fitting range is because we don't want you to get into a situation where you have a whistling hearing aid or things like that. So I think we've learned a lot about the fitting range and I would love for the fitting range to be broader than it is today, but it's just tough with the feedback. So if you stick to the fitting range, it's for those patients and it works really well, but unfortunately like a steeply sloping loss, you just can't do.

- It just need a different solution. But of course that's part of personalizing, right? Individualizing why you actually need to meet with an audiologist and figure out what the match is of technology. That's awesome Laurel, thanks so much.

- Sure.

- All right. And I'm gonna move it on to Brian Taylor who's coming to us from WS Audiology and specifically our Signia piece of that. Hey, Brian.

- Thanks Catherine. Good to be with everybody. I am going to try to answer the question that's here on the slide and I wanna focus on the hearing aid follow up process. I say in my first bullet point that it's much neglected. I don't mean that it's neglected by the hearing care professional. I think all of us spend an awful lot of time thinking about what happens during the follow up and we know how important it is. I'm thinking more along the lines of we don't have a lot of data around what's are the best practices for follow up care? I can't think of any of the professional organizations that have written much about what needs to happen or any data that support what the best approaches for follow up care.

I think most of us know, and there's only a few studies that have looked at this, that the average number of post fitting appointments over a year one of hearing aid use is about three. And, of course, that takes a lot of time. Every follow-up appointment is

probably a minimum of 30 minutes of booked time, even though you only may spend half of that with the patient. There's other things that you're probably doing in regards to that appointment. And I think also there's a study that was done in 2018 by John Tecca who's a retired audiologist in Michigan. And basically what he found in his practice was that about a third to half of the time was spent during these follow-up appointments with fine tuning, which of course is hooking up the hearing aids to the software and making adjustments.

And there are some limitations to that. Patients sometimes have to wait a week or longer to get in to see you. They may have forgotten exactly what the problem was, they have to try to describe it and then the audiologist has to interpret the results or they have to interpret what the patient is saying and then make the adjustments maybe based on their own experiences. So I think there might be a better way to do this and I think this might be a great application of artificial intelligence or machine learning. And I wanted to talk a little bit about this really cool feature that we have called Signia Assistant, which uses machine learning, pulling data from thousands of other hearing aid wearers to make better predictions about fine tuning adjustments and allowing the patient to do that on their own.

So it's very simple and we have data to suggest that when patients have the ability to fine tune on their own, it drives the acceptance rates to higher levels and it even empowers the patient to be more actively involved in the fitting and the acclimation process. And, of course, from the provider's standpoint, I think it's a great way to free up time so that you can spend things during follow-up appointments doing other things that might be more important, like coaching the patient on how to use other features like direct streaming or other health related apps that might be on board the hearing aid. So very briefly, you have to have a smartphone to use this.

You click on the Signia App, it opens up the Signia Assistant. and you can see that it's not just random choices, there's only four possibilities when it comes to fine tuning my own voice, other voices sound quality and handling. And then you essentially tell the Signia Assistant what the problem is and it gives you some possible options. You can either keep, try to continue to improve it or go back to the original setting. And if you look under the hood, it's a great application of kind of this hot term you hear now in the industry called Deep Neural Networks, gathering information not only from the situation the patient is in, but also other information that might be onboard the hearing aid.

And then using cloud computing to gather, as I mentioned before, data points from literally thousands, hundreds of thousands of other users around the world to make better predictions around the adjustments that are made. So I think it's a really cool and helpful way to free up time in your clinic and allows for more precise, fine tuning adjustments. And in a lot of ways it's a win-win situation. Patients have greater feelings of empowerment, higher acceptance rates, and, of course, it frees up time as I mentioned for the audiologists to practice more individualized care and support.

- Brian, thanks. So it's interesting, I got to see the slides ahead of time and when I saw some of these I thought, hmm, is this the opposite of individualizing, the audiologist individualizing things for people and it's really interesting to hear how you talk about it, freeing up our time to do the things we need to do versus the individualization that the person can actually do for themselves in their environments. So it's interesting to try to separate out those two pieces, right? So if you think of, if the person can be doing this in their own environment, making some of these changes when they come into you, I'm just curious if you can talk through a scenario of what we might do with that information.

- Well, I think it's a way to, first of all, you can open up the software and you can see how the patient has used Signia Assistant to make adjustments. So I think it gives you

better insight into maybe how the patient is fine tuning their own hearing aid. And I don't think it takes away any of the value of hitting and matching a target and verification with real ear measures and all those kinds of things. I think it just allows you to see what the individualized preferences are of the person. And in my opinion, it's a great blend of sort of the human element and then what machines bring to the table. Pooling data from thousands and thousands of patients, crowdsourcing many, many opinions are probably better than one or two. And so take advantage of the fact that you can gather that kind of information now I think is really a good use of time and technology.

- Okay, thanks. Thanks so much Brian. so your presentation and Laurel's are a great segue to a question that I'm actually gonna take the prerogative to answer in the Q&A, which then segues perfectly into our next speaker. And so the question is saying, with the mic down in the ear canal that individualizes things and then with what Brian was saying in terms of letting the person do some individualization. So then the question is, so why are we so focused on hitting real ear targets? And this is just a fantastic question. So to sort those out, when you think of the treatment for hearing loss is audibility. Every study shows that when we actually wanna get the person the best function and benefit, it's returning an audible signal.

And so we're using personalized real ear measures to do that. We are bringing back audibility across frequency, across input level. So that's what real ear measures give us and I know our next speaker will speak to that. And then what Laurel and Brian are talking about is that that fine tuning that relates more to the sound quality of what the person is getting as opposed to audibility. And I love this question because I think for us, when we think about individualizing the fitting, it's great to think of those in two different camps. There's audibility the primary treatment, why people come to us in terms of hearing loss. That has to do with needing to verify that we returned audibility, currently the most efficient and correct accurate way to do that is through real ear

measures. But then there's the individualization more in terms of the sound quality that the person experiences. So great question. And with that, let me move it on to John Pumford, who's going to speak to the same topic. Welcome.

- Great, thanks Catherine, and thank you everyone for attending today. I was happy to hear, I guess jumping in that you've already touched a little bit on the value of real ear measurements and verification and its importance around individualized care and think at its core that's what audios scan in our systems are all about is ensuring individualized care, best practice procedures for the fitting of hearing instruments. And we're able to do that by basically measuring and ensuring that the amplified signal levels are appropriate in the ear canal of each patient where appropriate is typically defined as matching verified or validated generic fitting formula targets such as NULL or DSL. And I think if we look to the research literature, what's quite clear is we really can't be sure what a product is doing in the ear canal of our patients unless we measure it.

And the performance can oftentimes vary significantly from what we might see in the measurement or simulated measurement curves in fitting software. And so it really comes down to the fact with real ear measures, we're able to account for that individual variability in your canal acoustics, and device characteristics that the predictions in fitting software is just sometimes not able to capture. In addition real ear measures allow us to evaluate various adaptive features that are designed to address a particular need for a patient. So for example, directional microphone technology, it's obviously important to ensure that it's operational, but, of course, there are various parameters that can be manipulated in fitting software. And so with some of the tools available in modern verification systems, we can actually make an educated decision around how we're adjusting these programming parameters for directional mics or noise reduction, frequency lowering and so on.

And then, of course, to say more individualized the counseling components, we can use the measurement screens themselves to inform our conversations just by simply referencing the curves that we see, whether it's in an adaptive feature screen or even in the speech map screen, which I'll touch on a little bit later. So by individualizing the fitting of the hearing instrument using earlier measurements, if we look to the research literature, we can see evidence of a number of significant benefits for both patients and providers versus unverified first fits. And so I've listed here along the screen for you just a number of the key components, which I think we'd all agree are quite important and things we would strive for when fitting hearing aids to our patients, including improved audibility versus unverified first fits, improved listening outcomes, improved patient satisfaction, improved patient loyalty to the practice, improved patient perceived quality of service.

Two items there I would say obviously significant importance in today's day and age of increased competitive pressures in new product delivery channels. It's always great to have a service available to us that has been shown to provide significant value to the patient and allow us to differentiate and ensure importance in delivering hearing healthcare. In addition, and it was interesting to hear, I think Brian touched on this a little earlier, we can see through verification that we have improved fitting efficiency as well. So that need for follow-up visits can be significantly reduced, freeing up our time to conduct other services such as hearing aid orientation, which oftentimes we don't have enough time for in our fitting appointments or perhaps to see even more patients in our practice.

So with those points in mind, Audioscan developed our system really to support individualized care in a few different areas. And so I've kind of highlighted at a very high level here some of the industry leading technology that we provide, including the ability to simultaneously verified two devices in the ears of the patient, and in the test box, which obviously offers significant efficiency, opportunities and the ability to assess

what's being communicated across systems by normal monitor headphones. So we can use that for troubleshooting of patient complaints, wideband measurement capabilities, so we can assess extended bandwidth audibility capabilities of a system. And there's a number of advanced testing capabilities as well. Of course, at its core speechmap is really our key consideration.

And so you have a quick representation here of what we're trying to do with speechmap, where we're delivering calibrated speech to a hearing instrument in measuring the output relative to the dynamic range of the patient, which can help us individualize the fitting to validated prescriptive fitting formulas or even just inform our counseling around or potentially uncomfortable for a patient based on how the device is set. And we're accounting for all of that individual variability and your canal acoustics and device performance that first fit doesn't necessarily capture. And finally, there's also a number of other evaluation tools available to you as a provider. And so I've listed a number of them there, and of course once we've then established our base audibility, we can then start to dive into the performance of some of these more advanced features to ensure they're programmed appropriately and performing appropriately. And also you can see there, depending on some of these different form factors that we're dealing with CROS or BiCROS systems or even bone-anchored hearing device systems, there's now ways to verify these systems and ensure that they're set appropriately for the individual needs of the patient.

- Great John, thank you. So just a very quick question. Do you have tutorials on AudiologyOnline on some of those features?

- We do, yeah. I mean there's so much to talk about, right, as it relates to the tools and measurements and procedures. And so we do have on AudiologyOnline industry partner page with various webinars, videos, and articles.

- Great.

- We also on our website a library as well with a bunch of videos that walkthrough these procedures as well.

- Great. We'll point people to those, 'cause I'm sure people have questions about some of the specifics. I'm gonna move on to Shannon, who's joining us from Phonak to address the same question. Welcome Shannon.

- Hi, thank you. Okay, thank you so much for being a part of this and as everyone has said here, individualization is the key here. No one wants to be put in a box, especially as it relates to healthcare of any kind and that applies to hearing healthcare as well. And as everyone has said, it truly is all about the individualization. And I think the answer is actually embedded here in the question, and the breadth of Phonak's portfolio is actually the starting point for individualized patient care. We have a saying at Phonak that a Phonak is for everyone. And if you have a peak here on the screen, I think that you can see that that's true regardless of where your patient is on their hearing journey.

You can find a Phonak solution that likely meets their needs from hearing loss prevention to simple plug and play solutions like a partner mic or even if you get down to it a fine tune direction form with Roger On, it's all there available. Choose that solution that's individualized to any patient need. But answering the call to about individualized patient care. It's a process like Brian said. There's no company or no person that can simply just open their eyes and boom, know exactly what someone else needs. So I certainly don't wanna misaligned expectations with regard to what we can provide, but I do wanna show you how Phonak is a partner in an individualized care. According to some generalized market stats.

Like Laurel said, most individualized with hearing loss will be fit with a rick. Great news, we have those. And they're pretty amazing with regard to hearing performance and sound quality. I mean, but every manufacturer has those. But what happens when that Rick patient comes in with significant stigma barriers? We at Phonak, we can allow you to pivot and provide that patient with a product like Lyric, which can truly be invisible and hassle-free and extended wear back in about from a bigger perspective, apart from that broad portfolio of solutions, the technology that we offer, it's the flexibility within those solutions for both you and the patient that truly allows for customized fittings.

So a perfect example, Stereo Zoom 2.0 that we have, I mean it's outstanding for hearing and background noise. It can be individualized by you in Target and by the patient in the myPhonak app. Clearly, it's more than just the widget. So when we think beyond product more and more as an industry, we're starting to realize that there's this importance being placed on patient-centered care. Everyone has a unique hearing journey and we need to be touching on the emotional triggers that move hearing healthcare away from solely selling products to holistic personalized solutions. And like Brian said, they're having the full experience from that very follow through aftercare and follow up. I mean, it's impossible to be all things to all people, we understand that.

But one size fits all approach to hearing healthcare is not gonna suit the needs of today's patients. So for us, providing individualized care isn't about delivering innovative products to the market. It really is the products as well as industry leading digital services and providing you with support that no other manufacturer can. So working closely with Phonak unlocks a digital additional support services such as marketing and tailored learning and development, as well as expert business insights and best practice benchmarks. We have this phrase at Phonak, I don't know if you've ever heard it, but we say, "Together we change lives," and this is how we bring it to life. So we hope to provide you the best hearing healthcare for your patients as you set

yourselves upon, because just about the product, sure it takes fantastic technology and innovation, but without you, it kind of takes us closer to being just a widget.

- Thank you Shannon. That's a nice sentiment certainly for the partnership of audiologists and our industry partners. I appreciate that, certainly that message. So we are gonna go on to our second part here, and we're gonna start with another poll. So I'm most excited about differentiating my practice by promoting individualized care and solutions. Two, unbundling devices and services in my fee structure. Three, continuing improvements in connectivity. And four, becoming a smart phone expert. I can't wait to see the answers to these. So you can start answering this, and I'll introduce you to our next question that we're gonna be asking our colleagues. And this one is describe one or two takeaways that an audiologist can directly apply to patient care in the clinic related to your product, technology, or service.

So that's what our next section is gonna be focused on and we'll have four more people answering that. So looking at our poll, differentiating my practice by promoting individualized care. Well then that must be why you're on this call today. Not too excited either about unbundling devices and services or you've already done it. I'll leave that. It could be either. And somebody wants to become a smart phone expert, so God love you. Moving right along. We're gonna jump right in with Randy Baldwin addressing our next question. Randy.

- Thank you very much Cat. So yeah, I do wanna answer this question. First and foremost, a lot of people may be saying, "Well, so what about promotional financing? What about it?" It truly is a win-win situation for both the practice and for the patients. The practice, when you think about promotional financing as a product and not just a service for your patients, you really can get the benefits for your patients and help them get that individualized service that they're looking for, whether it's in a product or with

the financing. As all of you are very much aware more so than I am as I'm not an audiologist or a health professional, a hearing health professional.

One of the things that happens quite often is the tested but not treated is because of costs, right? This example you may say, "Oh, here's living spaces, how does it apply?" So my a-ha moment on how important promotional financing was is when it happened to my wife and myself when we went out years ago. We had a set of twins and they were growing out of their little beds and they went in the big boy beds. So we went actually to the living spaces and this is where they first introduced to me promotional financing. I know this is a retail environment here, but I think it applied very much so even in the healthcare space and in the hearing industry as well.

When he first went in, the salesperson, I don't remember his name, actually introduced himself and the first thing he came outta his mouth was, "Okay, what is it that you're looking for?" We told him we were looking for beds and then the next thing he said is, "Whatever you find, we have promotional financing here, 18 months deferred interest. As long as you pay it off in the 18 months, you don't have any interest." It gets waived, right? So I thought about it, tucked it away, and we actually went through our shopping. So my wife and I, we had the funds, we had the money for buying what we wanted to buy, but we ended up getting a whole complete room set for the twins.

A little upgraded because of the fact that we knew that we could have this option. So again, it was a win-win situation for living spaces. It was a win for me, because we did take advantage of that, right? And we paid it off within the 18 months. So how does that apply for us today even in the hearing space? Obviously you're not going to have someone walk into your practice and the first thing comes out of their mouth is don't worry about the pricing, you can help you get it afforded so on and so forth. But after you're going through the exam, you find out the person does have a hearing issue, that a hearing device will help take care of that, nine times outta 10.

How much does it cost? Especially in today's environment with over-the-counter opportunities or other opportunities? It gets confusing for consumers and they want to know, and they're very conscious about costs. So one of the things for us is being able to use patient financing as a product gives you the option to help your patients that's more concerned about costs, help them to understand that you can individualize their options for pain. Quite often people will come in with maybe partial payment or maybe the whole amount, but they may not want to use their money straight to buy the hearing devices. And so as most of you're familiar with CareCredit Synchrony, we were owned by Synchrony Bank.

We actually have two products. We have the CareCredit line of credit, which gives the patient individual options according to what you as a practice will do, and being able to offer whether you want 12 months, 18 months deferred interest as a credit card. But you may also have patients that don't want a credit card, a revolving credit card, and they want a loan product. So we acquired Allegro Credit about two years ago, which we actually have installment loans, so your patients will have the choice. Again, it's a win-win situation for you and for the practice, giving them individual payment options, if you will, to make sure that they can get the things that you have recommended to that.

So basically, sorry about that, that's our two product lines. We have always have products going along, coming out to help the practice, help the patients individualize their payment options, and with over 12 million plus active card holders of CareCredit, and I don't know how many of those had actually taken a loan from a Allegro. There's always someone that will walk in with the card. So my key is be individualized with your payment options for your practice and for your patients.

- Great. Thanks so much. It's interesting and I always love this when we do this panel, how everybody fits into this topic. And I hadn't thought of, obviously I think about how my patients are gonna pay for their hearing aids, but this concept of individualizing how that's gonna work for them. I love that message. Thanks so much, Randy.

- You're welcome.

- And I am gonna move us on to Catherine who comes to us from Cochlear, who is addressing the same question.

- Yes, thank you Catherine. And thank you so much for having Cochlear as part of this panel today. In thinking about this question, I actually have a lot of takeaways that I would like to talk about, but I think the overall takeaway and everything I will roll up to this is that you, the audiologists are a vital part of patient education and guidance regarding implantable technology. If I could go to the next slide. In 2015, I'm going to talk about the need first here. But in 2015, it was estimated that 12% of the patients who could benefit from a cochlear implant audiologically actually got one. And that doesn't mean that the rest of them didn't necessarily want cochlear implants. It really comes down to access to care and knowledge about candidacy.

So the number of patients getting implants has significantly increased since then. So that's great news, but there have been some positive trends that actually have converged to challenge us even further. First, we have increasing awareness of CI candidacy with new tools like the 60/60 rule, which I'll talk to you about in just a moment. We also have an aging population, which means that more people are seeking care who have significant hearing loss, and then we have ever expanding candidacy indications. So there's been the expansion of CI candidacy to single-sided deafness as well as the expansion of Medicare criteria to match FDA guidelines last year. So all of this, it's good news. It means our potential pool of patients has increased,

but now we're only treating about 2% of the patients that could benefit from implantable technology.

So how can we affect that number? I'm gonna go back to the 60/60 rule that I just mentioned. There was a paper recently by Terry Zwolan and her colleagues really discussing how challenging it was for an audiologist who doesn't frequently work with cochlear implant patients to know who to send for a CI evaluation. And so they looked at their data and found out that a good rule of thumb for who you could be referring is really the 60/60 rule. And what that means is that the patient has a pure tone average greater than or equal to 60 dB five, one, and two, or single word understanding in the better ear of 60% or less. Now what they found was with these criteria, 96% of the patients met traditional CI implant criteria when seen by a center.

So it's a good rule of thumb for us to use with traditional audiometric testing to just think about, when we might want to send a patient for CI evaluation. Now in thinking about how we talk to our patients, how we send them along in the journey, there are different paths that you can take to assist your patient along the hearing journey. First, you could work at a Cochlear Plant Center. So that means that you have direct access to a CI surgeon and you work hand in hand with him or her to assist patients along that journey. If you are a private practice audiologist, you may consider the Cochlear provider network. So this is when you are partnered with a CI surgeon and CI implant center and when you refer your patients over to that surgeon, the surgeon performs a surgery and then sends the patient back to you for initial activation and all of the subsequent programming appointments.

So that means that you're increasing access for your patient database, you're retaining the patients that you have, you're developing great relationships with the medical community, and you're also introducing an alternative revenue source for your clinic. Now if that doesn't suit your clinic or you don't prefer to be a programming clinic, there

are ways to be a great referring partner with your local surgeons and CI centers. And we at Cochlear can definitely help you with the resources and tools and guidance you need to make that really successful. So the overall message is that our patients have more and more options and you can be part of educating them and guiding them to implantable technology when appropriate. There's a lot of information that I threw out here about candidacy, about expansion of Medicare coverage.

I wasn't able to even get into some of the innovation that's available for your patients. So please use these resources on the screen or reach out to me personally and let's learn more about how you can think about that continuum of care for the patients in your practice. Thank you.

- Thanks so much. That was really helpful. Cochlear has amazing information, I think. We certainly appreciate the kinds of information that's accessible on your website and that people we work with give us. I think the introduction to the 60/60 rule is really empowering to make sure we're getting more people tested. It doesn't mean they have to get an implant, but getting, at least that testing and that discussion of what really might be helpful to them. And we're an implant center so we think about these things, but having that kind of simple rule has actually made a big difference for us.

- That's great to hear. Thank you.

- Yeah, that's terrific. Yeah, yeah, absolutely. All right, so I am gonna move us over to Brian Taylor who's gonna answer the same question.

- Thanks Catherine. As much as I'd like to talk about bilateral beam forming, split band processing, own voice processing, all those kinds of cool features, I am gonna stick with my theme of AI driven technology to individualize the fitting and go back and revisit Signia Assistant and remind everybody that Signia Assistant, which is on a

person's smartphone and very easy to access for most patients, allows them to pool data from thousands of other hearing aid fittings to essentially train their device to improve its fine tuning capabilities. And I talked about that before and I just wanted to briefly kind of follow up and talk about it again. Because I think that you're gonna see more and more features like this become better and better over the next few years.

And we have some data, we have a couple of posters next week at the AAS meeting, the American Auditory Society meeting. So I can't get into the details yet, I'll have to hold you in suspense. But essentially when you put a tool like this in the hand of the right patient who wants to use it, we found that that level, that improves the, it's more interesting, maybe more interactive and engaging that improves their motivation to actually wear their devices more consistently. In addition to that, because they have the ability to do that, it allows for more precise adjustments done in real time and we have data to show that that improves their acceptance rate over time as well.

And then finally, I think you're gonna hear more and more in the profession, this word empowerment and how tools like this allow for greater levels of patient empowerment that leads to greater confidence, greater ability to wear their devices consistently. And then hopefully at the end of the day that improves quality of life participation, day-to-day activities, whatever it is that's important for the patient. So I wanted to kind of touch on, I think the power of AI-driven technology and how it can be put to use to individualize the fitting and really bring patient centered care to a new level.

- Thanks so much Brian. So I know people who are disappointed that they didn't hear about beam forming. If they're an auditory society and they buy you a beer on a napkin, you'll explain it, correct?

- I'll do my best.

- Brian has explained many things to me over the years and I'm always grateful and you're the right person to talk to about things like that. So I'm gonna move this over to Laurel, who's gonna answer the same question.

- Thanks. I actually would rather talk about beam formers and direct value. I will stick on the same kind of topic though that Brian is on and that is really using the app. And so when we started to develop apps, which has now been a while. Who's gonna use an app? Are these going to be a minority of people that are gonna use the app or most people are gonna use controls on the hearing aids? I think what we're finding is more and more even, the most elderly 75 to 85 year olds are trying to use app technology, are very successful using app technology and really would rather do that than kind of do the controls on their phone and such.

So I think apps continue to develop. There's something that is very easy for us to put new technology into because you can just update your app all the time. So apps can be very powerful and we have a fair amount of data that satisfaction can be actually impacted by having app personalization as well. When we looked at about a hundred users that did and didn't have the app, the ones that had the app and the ability to do some of the things you can do in the app, we're the more satisfied of the group. So I'm just looking at our app on the frontier, I mean there are many things you can do with an app, of course you can just change the overall program and the volumes and those kinds of things.

But there are little personalization things that you can see down here where it says noise filter and that'll just increase noise reduction, speech clarity would increase the gain in the high frequencies to just get a little bit of more high frequency gain when you're in a noisy setting. And those things actually really do help people if they're just on the verge of being able to understand the noise, and, okay, let me just get a little bit more extra high frequency gain, then you can go into things like speech enhancer and

you'll see screens like this and we've kind of talked about audibility, which is absolutely correct. We have to be audible first and so none of the personalization that we would have in our app would make it so that it's not audible to your patient.

We're not gonna give them so much control that things can become inaudible. But in the screen that you're seeing here, you can have low frequencies, mid frequencies and high frequencies. You can change gains. There's a lot of things. There's a lot of people who like to listen to music differently. I was at Catherine's session at AAA last year and she reviewed an article by Yellow Study, which it was a whole group of researchers looking at environmental classification and how if you classify music in your hearing age, you may not be doing a great job classifying speech and noise because a lot of speech and noise backgrounds have music as well. And so maybe leaving music to somebody being able to personalize it and switch to a music program and personalize it themselves.

People really like to do those kinds of things. You can just see the sound enhancer changing there where you can just kind of change a few dB up. You can also change noise reduction so you can actually increase it with the bar or decrease the amount of noise reduction, increase and decrease the amount of wind noise reduction. And so lots of advanced features, the defaults, and I'll talk a little bit more about this, but the defaults in software are not always the correct defaults. There's a default program, but is that right for everybody? Is that right for the people who come in with severe loss and mild loss? Well, the answer is probably no. But really we have kind of one set of defaults.

So for people being able to change some of these things and then Tinnitus Sound Generator, we know for sure that patients with tinnitus are better off when they can do something themselves, when they can have control over those sounds and what they

use. So there's a lot you can do to personalize. I see you on the screen, is my four minutes up already?

- Just wrapping up, you're good. Okay, I will just say one more thing and I started talking about the software and I think we really do fall into their default settings in autofit and everybody runs with the defaults, but the defaults really aren't right. And I'll give you the best example I have. Some software will default to very strong noise reduction for someone who has a 60 dB flat loss. And when you go to strong noise reduction with somebody has that much low frequency hearing loss, they will start to notice that their hearing aids, they'll tell you that they're going in and out. it's like they're in and out, they're turning on and off for some of the complaints you'll get because there's just too much noise reduction.

Noise reduction takes away low frequency gain and these people need it. So we have started to individualize first fit per hearing loss in our fitting software. There's a white paper you can look at there, but it's things like new users want more noise reduction, but people with severe loss can't handle that much noise reduction. And so we've started to personalize our noise track, our impulse noise reduction and those things to the user experience and to their hearing loss. So lots of different ways and more ways to personalize.

- That's awesome Laurel. I'm so glad actually you touched on defaults and that's interesting that you guys are trying to go after some of that, but that is really what we bring to the table and it's so important and that's part of that relationship with the rep and just being in the software of what does default and then really using your audiology knowledge and the data to rearrange that and not expecting the manufacturer to do that. They're not looking at the person or talking to the person in front of you. I'm just really, I'm so glad you touched on defaults such an important topic. Awesome. Okay, we are moving on to our last poll. We did this poll for MarkeTrak 10.

MarkeTrak has renamed. Now it's gonna be named by the year, so we all have to get used to that. But we can handle it, we can do hard things. MarkeTrak 2022 indicates that some percent of current hearing aid users are satisfied. So start answering that and I will talk to you about what the next question's gonna be. So it will be described something about your product, technology or service depending on what the company does that supports the family of the individual with hearing loss. And this was something a bunch of audiologists told us they wanted to hear about, really thinking about individualized care for the whole family. Educate us about how we integrate this into our services to support the family.

So let's take a look at these answers and what we're gonna see here is 50% of people are satisfied, 63, 74, 80 some got everything. Okay, people, well I guess I have good news for you today. It's 80%, it's over 80%, and it was over 80% for MarkeTrak 10 too. This continues to be a fairly high number, but there is more to these data. And later in the hour, Brian Taylor will be using this information further, which I'm kind of excited about. Okay, so I am gonna turn this over to Steve DeMari. Steve, I think this is the first we're hearing from you. So welcome. And he's coming to us from CaptionCall.

- It is. Thanks Catherine, I really appreciate it. Can you hear me okay?

- [Catherine] Yes, you sound great.

- Great. Thank you. Appreciate it. Love hearing all this great science and technology and how everything's improving for our hearing impaired patients out there, our hard of hearing and folks that need support. So it's great to hear all this information. I'm gonna give you a quick overview of CaptionCall and let me advance the slide here to, so in general, so touching upon more of the humanity side of things, I guess, and not so much science, but so CaptionCall, which is now CaptionCall by Sorenson. Our

solutions can create clear accurate text of conversations in real time. So just a little overview of what the service does. So people with hearing loss who need captions to use the phone can go about their lives and maintain their connections to family, friends, to be eligible for the service.

You need to have hearing loss and difficulty communicating on the telephone. If so this allows you to use two possible services. One is the CaptionCall service for your home phone and our captioning, Olelo mobile app. And either of these services will help you better understand your phone conversations with fast, accurate captioning. The service is part of a federally funded program. So again, it's that notion we're from the government and we're here to help. Well, in this case, it's true. So people who need captions to use the phone because of the hearing loss can do so at no cost. And patients can self-certify or in conjunction with their hearing healthcare professional audiologist can help them sign up for service.

According to one study, it was reported that hearing aids provided 55% benefit during phone conversation. So in general, just for phone conversation, which is a very important listening situation for most people. In most cases, second to one-on-one conversation. So this leaves many with some ongoing difficulty when talking on the phone. And this is where a CaptionCall may help. Few things, reduce the burden of the hard of hearing patients and their loved ones who wanna connect via the phone. They can build trust with patients for those practice owners and practice audiologists offering support of no-cost technology. Demo phones, for example, in their office where the HHP can help show firsthand how it works. The case history typically is always gonna ask about phone usage, determining whether that patient is a candidate for Bluetooth connectivity or possibly do they even still have a landline phone, do they have a smartphone?

And really just trying to figure out what type of technology are their patients using. It reduces telephone related complaints. This may or may not be a Bluetooth and connectivity candidate. So this offers, the CaptionCall technology offers an easier method to use the phone. Phone usability. It increases the patient's phone confidence, their happiness, and it creates the ability to use the phone unencumbered. That's beneficial for them to the family, knowing that the loved one can effectively communicate over the phone, that sets the family at ease. And it immediately improves their lives. It looks and functions just like a regular phone. So with added some added features that they can also take advantage of. So really there's nothing new to learn technically, but we'll get to that in a little bit.

It helps patients obviously connect with family and stay connected. They're not left out of the conversation, which may also reduce their social isolation. They're able to save their conversations. Children, grandchildren, loved ones that may live at a distance can listen to them again later. So it's nice to have those conversations that they can look back on. Is also important information such as the text of caregiver instructions, medical instructions, locations, addresses, dates, things of that nature. They can rely on that and they can look back and listen to that information later. And then most importantly, 911, they have ability to use the 911 from their landline is still the most reliable method of reaching emergency response personnel. I've got a few more here, Catherine, but if you wanna, if I'm out of time.

- Yep, actually just this second.

- Okay.

- I think that gives us a great overview. Thank you.

- You bet.

- And we'll be hearing from you again, which is great. This is, talk about empowering, such empowering technology, and so I know as a clinician being able to say, and this is free and really nice, people are gonna come and get it set up. It's huge. Really huge for us. So thank you, thanks so much.

- You bet.

- All right, I'm turning over, Dave, we made you wait a long time. Dave, you did a good job.

- I was very patient. Thank you.

- You were. Here we go.

- So I'm going to talk and I appreciate this format as well, and the other presentations that were highlighting that increasingly the application. The user app is as much the way that the patient interfaces with their technology as the hardware in the past. And one other area that I wanna talk about in four minutes relates to the fact that while the patient is there and you're working primarily with them, chances are they have a family member or caregiver who has a vested interest in the outcome and may have even initiated their visit to come in and help persuade them. And many clinicians will have as an expectation for best practice, they'll bring in a family member to assist at overcoming initial objections.

But one of the things that we were interested in was developing a companion app that could be used with permission of the hearing aid user. So that loved ones, even caregivers could follow along throughout their day in terms of their use and interaction with other individuals. And then as well, we've been on a journey for several years now

tying hearing aid use to overall health and wellness by incorporating embedded sensors to measure physical activity and social engagement. So Hear Share is that app that allows family members to participate in that patient journey, if you will. It is absolutely under control of the hearing aid user to decide what it is that they would like to share with those invited participants.

If they want to share activity data, hearing data, including hearing aid use and interaction and wellness data, they may, but they may exempt any portion of this or terminate the sharing at any point in time. The patient is in control. What ends up happening is they issue an invitation that comes via an email. The individual responds indicating that by entering a code that they received this code and now can share in HIPAA or MDR DPR compliant fashion, those data. And then the individual receiving that invitation has to accept, indicating that they're willing to do so, and participate on that journey. And to just give you a very high level view of what the family member or loved one sees.

They can see whether they are charging or whether they have batteries in their hearing aids, whether they're using the devices throughout a day. We set the daily goal default to 12 hours, but consistent with what Laurel was talking about in others. This is modifiable by the individual in the app, by the hearing aid user with their step goals and standing goals to encourage musculoskeletal strength throughout the day. The remaining piece then just shows what the caregiver or family member sees in this case. I do have, this is real time, it literally is showing in real time the hearing use in this case, and I can dive in and see that I have, I'm serving as both my caregiver and my hearing aid user in this case that I got up and worked out this morning.

It shows the time that they're doing a time plot as well as the data over time throughout the day. And we've found and heard back from family members and patients alike that this has been a very useful feature for them to be engaged in the patient journey. And

then the other thing I briefly wanna mention is a way that we engage family members by becoming the industry's first and only product that enables the hearing aid user to select up to three contacts in this case, Hear Share allows an indefinite number, an indeterminate number of people to receive and share those data. But with the fall detection algorithm, if the patient is wearing their hearing aids and connected to their smartphone and a signature from the inertial measurement unit in the device detects a fall, it can alert up to three contacts.

And the data that we've published in JAAA paper from a couple years ago shows that the accuracy, the sensitivity, and the specificity of this in comparison to that commonly neck worn pendant is comparable or better regardless of whether used on normal or high sensitivity. And we feel as well and have heard back from the market that this has in many ways provided peace of mind and beyond peace of mind, even has resulted in a baby boomer nightmare of someone laying on the ground saying, I've fallen and I can't get up. That we've heard from patients that has made a significant safety factor as well as a peace of mind factor.

- Dave thanks, that's great. I know I always think, I took my mom to the hospital and they put a fall risk band, bracelet on her, and I said, no, she's a false certainty. This isn't a risk but she's going down.

- Yeah.

- It's just a matter of when.

- The thing that, it's very interesting you say that because in addition to the perception in the mind of the professional in many cases thinking this is an older, for older person's affliction, what has been startling is we've heard back from people that even if

they don't think someone's a fall risk initially, we've had people that have enabled that feature and fallen and been appreciative of the fact that the feature was active.

- Yeah, yeah, absolutely. So it's interesting with, so you've talked about apps, other people have talked about apps and other people have talked about fine tuning the appointment using real ear measures, getting that to be efficient because this is a lot of time, right? And this is really about, we are individualizing, these are really kind of the fun things to really think about someone's life. But we have to think about our appointment times maybe differently and even who is doing this work. And this work could be with OTCs, not just hearing aids. Any thoughts on that?

- Indeed and really what we're trying to do, not only the time spent in the clinic, but the fact is that the family members like I said, have a vested interest and they're the companion with this person. In many cases, 24/7. It could even be a professional caregiver and they can augment that relationship, bring back that report, and we can as well look at it in data logging to really encourage and modify and adapt and personalize the settings and the results on the basis of data that occur from that 24/7 monitoring.

- Awesome, thanks so much. All right, I am gonna move on back to John.

- Thanks Catherine. So some great points made there. I'm gonna, as far as attempting to answer this question, we do as a company, have a number of tools available to support family members. And one key example of that is the speech map screen, which I know is traditionally thought of as a method of fitting and verifying hearing instruments to targets. But I often like to point out you have the opportunity on these screens to actually present various unaided speech spectrums and plot that out relative to the dynamic range of the patients. So family members can, for example,

better understand the challenges that family member is facing and you can use that information to support some of your treatment goals as well.

But understanding there's a lot of, let's say, clinical jargon and technical components to this screen understandably. We've recently developed a number of counseling overlays where we've stripped away a lot of the, let's say the clinically focused components and dialogue and use some language here, that's a lot more consumer friendly and very simplified screens that, for example, early on in the patient journey and in the family member journey, we can use to explain the results of the hearing test. There's kinda a lot of a flexibility here in terms of the workflow to put various environmental signals and phoning overlays on the screen. And also just an opportunity to kind of reference back again to what someone with normal hearing might be able to hear.

And again, kind of speak to the challenges that particular family member might be facing. Within that counseling view as well, you can activate what I'd say is, is specifically focused for family members to help them understand a little more easily some of the challenges that the family member with hearing loss is facing. And that's by generating the sensory loss simulator that we have here. And so in this case, we're actually generating either via the loudspeaker or filtered by ear through the headphones, the hearing loss that again the family member is experiencing. And you have the opportunity, as you can see on the screen here, to filter by various levels of hearing what someone with normal hearing might experience, for example, versus the patient.

And in contrast to some other hearing loss simulators out there, not only do we provide a conductive component, which is essentially just reducing all levels equally. There's also a sensory neural loss filter that's applied based on the Cochlear hearing loss model from Moore and Glasberg. So definitely a very powerful tool. Then let's

assuming the patient, let's say has been selected fitted with a hearing instrument, you can then access these counseling overlays again as you kind of walk through, not only with the patient but with the family member. Again, reminding them of the challenge that they're facing and the reason why they were a candidate for hearing instruments. But then there's the opportunity to pull in from your verification screen and speechmap, any aided response curve that you've obtained.

And so now we can again speak to the benefits of the treatment that you've provided. In addition, if there's interest, you can also access in terms of supporting counseling with family members, the speech intelligibility index graph that I'm showing you here. And so here, we can speak to some predictions around speech recognition as a function of the aided SII that you've delivered and contrast that with what the patient had walking into the clinic. And finally, while it's not necessarily an approach we would recommend for say programming a hearing instrument to a patient's hearing loss, there is something to be said for providing an opportunity for the family member to see for a very personal signal, let's say the spouse's voice, the audibility impact of what you've provided.

And so here, we're just showing an example of putting the device into say a spectral analysis mode where the family member is speaking to the patient. And then you can actually plot on the screen the audibility for that signal that was provided. And again, contrast that with what was possible without the hearing instrument. All in all, I think a number of powerful tools here to support family members and patients obviously.

- Absolutely, thanks. I haven't played around with your new overlays. I'm very excited to see this. And this, I think too, this isn't really a question, but a comment of just thinking about our appointment times and where this fits in. But in the long run, I think that level of counseling with a family can actually save a lot of time when they're on board and they get it and I'm kind of guessing you probably agree with that.

- 100%.

- Yeah.

- Yeah.

- And then the Speech-Live. This, I have loved this feature. If we have a family member who has really weak speech, so not the person with the hearing loss, but the family member maybe from a neurological issue, this really can help us think about what else do we need to do to help communication in that family? So I think this, not to mention this is an awesome way to measure feedback and then really surgically pull down specific frequency. So that's my little plug on speech live. I love that feature.

- Yep, I agree. Yeah, no, I think counseling as you say, kind of communication strategy conversations, it's also a huge win there with that tool.

- Great. All right, thanks so much. So I am gonna go to our next question then. We don't have a poll this time, but we do have a question. What are we going to see from your company in the next one to five years that will change how we provide individualized care? So specific to these companies, what's coming? I kind of love, I always love the what's coming question. Let's just kind of take a look ahead. So we are gonna start with Steve DeMari from CaptionCall. Hi, Steve.

- Hey, Catherine. Let's see, yeah, so well this is not only coming but it's here. So this is our Olelo app and so we're adding this mobile app while developing and refining existing CaptionCall features to provide options and alternative device solutions for folks. So again, you need to have a hearing loss and difficulty speaking on the phone, but the aim is to fit the lifestyle of the individual and bringing IPCTS, which is internet

protocol caption telephone service to them in a way and on a device that works best for the person rather than a one size fits all solution. So again, our captions are ultra fast. They captions come in a matter of a second. They see it in real time.

It's free flowing conversation with no caption delay. Very accurate. Olelo has been rated one of the most accurate CaptionCall providers by an official SCC study. It's a 100% private, secure, no transcriptions or assistance listening to your private conversations. It's powered by our state-of-the-art automatic speech recognition technology and then Olelo captions on the go. So essentially from anywhere, works on any smartphone with Wi-Fi or mobile data. You can see all of your transcripts and call history. And again, it's nice to be able to refer back to those conversations. Again, another important concept of emergency 911 calls are captioned in real time and available on both Android, iPhone, tablets. And then some of the main questions that people usually ask is, is do I need to have a hearing loss to use Olelo?

And yes, you do. Again, to be a part of our, the federal TRS fund, you do need to have a hearing loss in order to use this technology. Again, the word free comes up, it's a no cost for qualified users. So we're able to get, we're able to offer Olelo at no cost to your users because we're part of the SEC IPCTS program. Another big one, Dave, you might be interested in this. Olelo's not yet compatible with an Apple watch. However, lookout for product updates as this might change soon. And then finally, what is IPCTS? Again, I think that describes not only the Olelo service but our caption telephone service. And again, that's our telecommunications relay service that permits an individual who can speak, but who has difficulty hearing on the phone to simultaneously listen, already captions.

- Okay, that's awesome. Thanks very much. Someone came in the clinic the other day with Olelo, and it was really interesting to see how that kind of broadened their world, being able to use it that way. We have audiology assistance in senior living and through

the pandemic being able to have access to these phones for family members who could no longer come in and shut down. It was just the reports from family members. I mean it really brings tears to your eyes. But it was amazing how it connected people who literally would not have been connected.

- For sure. And I wish we had more time 'cause you're right, the feedback from the family is just, that's the most endearing to hear because it really has changed their lives so.

- Yeah, that's great. Thank you very much.

- Sure.

- All right. But we are back to Dave. Hey, Dave.

- Hey, how are you? So I got to discuss one of my favorite topics that enables professionals to operate at the top of their scope of practice in the last segment. That is the fall detection feature hearing and balance is within the scope. And so I want to give a tease a little bit of some work that we've been doing in that area of fall detection and moving really from a feature that can provide alert and a safety feature in the event that a loved one suffers a fall while they're wearing their devices. But in many cases, as Catherine alluded in the last example, when a fall occurs, it's already too late. If someone has broken their hip, an aging population in particular, they often begin a downward health spiral.

So we have been engaged in a multi-year effort in a collaboration with Stanford, working not only in the area of fall detection, but fall risk assessment, balance improvement with the ultimate goal of fall prevention. So I'll just give a little highlight. We're using the steady protocol, which is familiar to those of you working with patients

who are at risk of falling or PTs and OTs stopping elderly accidents, deaths and injuries can simply use three questions as seen here. But also those three questions have very good sensitivity to high risk patients. But as I alluded in the last question and answer period, it's not always the patients that are at high risk that are suffering falls.

So an area that we have been working on is using the sensors that can track things like physical activity and standing and looking at the adaptation to elements of the steady protocol, including some tests like timed up and go 30 second chair stand, four stage balance where people are putting, lining their feet up one in front of each other or standing on one leg, and looking at a systematic process where we're initially having the automated scoring take place. And then gradually removing the professional from this automated scoring with the long-term goal then of using balanced training exercises to determine whether that in turn reduces the risk of falls. So stay tuned in that area. We're quite excited about it.

For as I said, allowing the professional to work at the top of their scope of practice. And then the other thing I wanna make brief mention of, we've all talked about AI to one degree or another as an umbrella category. A device that can learn reason is the ultimate goal. We've had machine learning and hearing aids for the last decade or more using algorithms that can be taught, trained on, listening and acoustic environments, in our case regarding the presence of speech, noise, music, quiet, et cetera. And where we're really seeing the development in the future, and I'll come back to this is in deep learning, but we've used acoustic sound-based classification, automated environmental classification for over a decade.

And here are seven examples of the types of environments hearing aid users might wanna wear their devices. In the old days, we had to change manual programs. Now they automatically adapt to incorporate directionality noise management and kudos to Laurel. I agree, and that in personalization of that. But really looking at the beginning of

this by using feature and pattern classification and processing and then detecting the accuracy, if you will, compared with humans for environmental sound classification is sort of the prize. And what we found is that even the most accurate acoustic environmental classification systems today are only about 80 to 85% accurate. Here I've simplified, what I had on the past screen was five different temporal or spectral or timing features.

In this case, I'm just using, let's say one temporal and one spectral. And you see that then when we expose them to a huge number of acoustic environments, there's some overlap with some of the classes, there's some good differentiation in others that can be even with a two feature set, quite easily characterized. But because of life, and this from New Orleans on Bourbon Street, speech can be both a stimulus of interest or a noise, same goes for music. And the rules-based machine learning classifier in an artificial intelligence system can't determine that listener intent. And what we did a couple years ago was incorporate edge mode as a means of engaging the individual with a state-of-the-art machine learning AI classification system to allow the individual to double tap or press in the app to say, "Right now what's in front of me is what I wanna hear."

And we think this augments what you can do with AI, with personalization in terms of the individual's intent. But where we're going in five years is we're going to see increased utilization of deep neural networks, which is a subcategory that can actually learn by itself based on vast amounts of data, how this individual and personalizes further beyond that rule-based machine learning classification system. So I think all of us are working in that area, but we're working deliberately. And that's it.

- Awesome, thanks. Yeah, I think that understanding intent, right? That's like the silver bullet that's really interesting. But my question for you is, I wear many hats, so sometimes I think about our educational program of needing to gear up and really I

think some programs will need to gear up and think more about the role we play in vestibular balance, which we may not have every student coming out of programs. I can't think of a why to say this. I think we may need to gear up in that area.

- Well, like I said, when we worry about the threat of OTC or we worry about low cost competitors to operate at the top of our scope of practice, I get it that some clinicians say, well, heart rate monitors or other things are moving too far. But hearing and balance is a core part of what we should be ready to do when we graduate, and that's all I have to say about that.

- Okay, there you go. We'll leave it at that and we will move on to Catherine, again joining us from Cochlear.

- Thank you Catherine. Very excited to answer this question. As we've been hearing from all of the panelists, medical technology is evolving rapidly to empower patients to get care in different ways. And over the past decade, Cochlear has been working with professionals to really develop solutions to support best patient outcomes in the implantable space. And in the next one to five years, our goal is to really offer an increasing range of technology and data-driven solutions within a digital ecosystem. And this is meant to transform the interactions between you and your patient and in your other clinicians and even with Cochlear as you're seeing your patients. So our connected care portfolio which you see here, is really designed to support you and your patients at every stage of the hearing help journey.

So some of this we're excited that we have today and some of it is yet to come. So what's included in this is, first of all, our surgical care component. So delivering solutions to enhance surgical outcomes via Intraoperative Insights. Next you see in-clinic care, so not only our fitting software and enhancing that, but also different types of patient management tools to help you support your patients. Then there's the

self-managed care portion, which is really providing solutions for patients to proactively manage their own hearing health journey. And then remote care, which is where I'm gonna focus a little bit over the next minute or two. This is all about the technologies that are designed to provide access to ongoing and consistent care while maintaining that connection between you and your patients, whether it's in the clinic or remotely.

Now the global pandemic, as horrible as it has been, has offered a unique opportunity to us to introduce patients to remote care. So in 2020, we actually received expedited clearance for remote check when remote care became critical to caring for our patients. And we're proud to be the first in the industry to launch this type of care for hearing implant patients. Now our Remote Care Portfolio can consist of Remote Check and Remote Assist. So Remote Check is our asynchronous support tool for patients with the Nucleus Sound Processors, and our Remote Assist is our synchronous support tool for patients with either the Nucleus Sound Processors or our Baha 6 Max Sound Processor. And you can check compatibility of those products with Remote Care on our website.

So there's always that check if you're not quite sure where to use which one. Now with Remote Check, as I mentioned, this is an asynchronous tool and this means that using remote check, the clinician assigns assessment tasks to the patient to be completed at home using our Nucleus Smart app, the results are then sent back to the clinician who determines what further follow up is required. Now we know that efficiency and economic viability will continue to be areas of focus for hearing professionals for the foreseeable future, right? I mean it's important and I think, Catherine mentioned it earlier, there's a lot of great technology coming out that means more time is needed from our clinicians to implement some of this and to help our patients to use this.

So while remote care is not intended to replace in person visits, it really is another tool in your toolbox that can be used to support patient-centered care while addressing

those needs of efficiency and economic viability in your clinic. So just a couple of the examples of how you might use remote care with your implant patients. First of all, think of it as a counseling assistance. So maybe when you're helping with a certain aspect of care, maybe device set up or help with the accessories, troubleshooting so you can triage even when the patient needs to come in or who the patient needs to see, whether it be you or maybe the surgeon or maybe Cochlear could reach out and help us something, helping with existing patients, so checking up on your patients without the need for them to come into the clinic.

And then with new patients, we can really start to implement this as part of our new patient protocol to supplement that in-person care. So I know there's a lot here, and we're having another session tomorrow, which talks about this at at 12:00 PM Eastern if you want more information on our connected care portfolio.

- That's fantastic. Thanks very much. Our clinic is doing more and more remote telehealth, and you're right, I think COVID kicked that off for us, but now people expect it and want it. We are in the southwestern part of Pennsylvania, which has tons of rural area, people who aren't near know our clinics. And this is really just a comment, but I think we have to be thoughtful. These need to be scheduled appointments for us, scheduled time, acknowledging, the time didn't change for the audiologist, it's awesome for the patient. This is really about making things more accessible for the patient.

- Awesome.

- I think people who haven't done this a lot, think somehow it's less clinic time, that's not true.

- That is true. But I think you made this point earlier or maybe the question of, who else in your clinic could be helping with some of these triage appointments and so on and so forth? So there's the opportunity to really create more efficiencies by looking at who is in the clinic that could help with this.

- Such a great point, and another place where we need to expand our footprint and who all is part of extending our care. Thanks, that's a terrific point. All right, we're gonna move over to Shannon, who again is joining us from Phonak.

- Thank you Catherine. This one is super exciting, but it also gives me a little heartburn because this question is one that kind of elicits the response that of course I could tell you, but then I may have to, I mean, of course, I'm not gonna finish that. And, of course, I say it in just, but I know that what happens in R&D until it's released. But another saying that calls to mind is it's helpful to use past performance for future prediction. And for the past 75 years, Phonak has been on the forefront of innovating hearing technologies and we've dedicated decades to developing products that enable connections between just millions and millions of people. And I think that you can see that it's safe to say that we will continue to light up these connections and we look forward to the next 75 years.

We've had a ton of firsts under our belts. And with Marvel, we really generated that love at first sound and moved the needle and our first fit successes and moved on to Paradise where we allowed people to have that, just hear that experience, the sound of Paradise. And then now Lumity platform, we have that sound quality that you expect from Phonak and it focuses on illuminating speech understanding and the most challenging of situations, which is speech and background noise. But earlier in my first question, we kind of talked about our expansive portfolio and I hope that you saw that how having such a full portfolio means that we just have a lot of different areas where we can innovate and ideate on.

Sure, AI and deep neural network and various digital apps, all of that is in the works. And there are a lot of little black boxes, which means there are many different surprises coming down the road. And Phonak has always fiercely innovated in hearing performance and sound quality. And you can continue to expect that from us in the future because audiology is truly at all we do. We do, like I said, we have many worlds first technologies to our credit, we are always extremely thoughtful as to which technologies we bring to our customers. And to that end, while we innovate with purpose, we know that, the mysterious black box that's in research right now will evolve into a lovely present.

Let me be a little cheeky for a moment, that we can turn over to you as soon as we can in a best in class solution for your patients. And yes, I suppose there is safety unveiled vagueness, but there truly is not much I can say about future endeavors other than we will continue to keep hearing performance and purposeful innovation as well as patient satisfaction and in-clinic success top of mind as we push forward. And you're also gonna continue to see how hearing loss extends beyond hearing sensitivity into total body wellness, especially in that cognitive space from us because we're important for audiology as a profession to look beyond the ears. Thank you.

- Thanks, that's great. So we kind of have to wait and see a little bit. So gave us a teaser there, and as you said, it will be worth the wait as we work with your company. All right, so moving on. This is the presenter's choice we always like to say, but what would you actually like to talk about? And then we always like to ask kind of a fun question. So we asked what the person's favorite non-work activity would be, and so I think you'll learn a little bit about that. I'm gonna start with Brian Taylor again coming to us from Signia and he says, "According to MarkeTrak 2022, hearing aid satisfaction rates are about 80%," which I said we were gonna come back to that, regardless of the purchasing channel. So that's the part we didn't talk about. This could be in-person,

remote or self-fit, given this similarity, how can I continue to make a difference? Take it away, Brian.

- Okay, thanks Catherine. As usual, the market, I actually have it right here in seminars, in hearing as usual, there is a ton of great information for clinicians and every MarkeTrak. And I pulled this out of the study that, or the article that Erin Picou at Vanderbilt wrote. I thought this was really interesting, basically saying that the overall satisfaction rate was really high regardless of where the person bought the hearing aid. Now of obviously, the data was collected before OTC, but they had a self-fit component, which I would guess is pretty similar to how an OTC hearing aid would be purchased today. And what I wanted to just kind of point out was even though the satisfaction rates were quite high, regardless of where the hearing aids were purchased, the net promoter score head and shoulders was better for people that purchased in person.

If you look there on the right margin net promoter score, I think most of us are probably familiar with that. It's been around for at least 20 years. There's some debate if it's really a useful metric, but regardless of all that, I think it's really nice to see that the provider makes a tremendous amount of difference. Look at the net promoter score for in-person, it's 30, it's actually a negative number for remote and a slightly more positive number for self-fit. So I think that really speaks to the importance of the human touch that we all provide. And back to my theme of AI driven solutions, I really do believe that you're going to see more of this human machine system working in combination where audiologists spend more time maybe talking about quality of life issues in addition to communication and using apps to better inform their decision making process and getting patients more engaged in the process as well.

And I also wanna point out that if you go to chat GPT or GPT or whatever it's called, I'm guessing that if you ask ChatGPAT to create an audiologist, that person on the right

might be what you get. But anyway, my favorite non-work activity is I live in Minnesota where we have very long winters and you can't beat ice fishing if you're trying to pass some time on a cold weekend day.

- Okay, I'm gonna, I love everything you presented. My brother used to make me go ice fishing with him and it's just, it's a nightmare honestly, right? Yes, I've never been so cold.

- That was modern equipment.

- It's right, Elaine Mormer here at Pitt says, "It's not too cold, it's that you wore the wrong things." I accept that and I am moving right on to Laurel. I didn't mention everyone, this is a speed round. So everyone has about two minutes in case you wonder why they're just telling you a few things. Take it away, Laurel.

- Thank you. I'm with you on the ice fishing thing, it's just a little too cold for me, so. All right, oh, I guess I should read my question. So what clinical tests can support individualized care and hearing aid recommendations? And I'll just go back to old tests. Brian, you probably could have talked about this even better than me with the red flag matrix, but I'm still surprised at how few people are using hearing and noise testing in their clinics. So we're talking about things like the Quick SIN or the HINT test. I mean, the Quick SIN obviously a very easy way to do it in a clinic. It takes about a minute and what are you getting?

You're getting how well does your patient understand speech noise? And what is measured is really that required signal to noise ratio to be able to understand speech. And so I have an example of the Quick SIN here just to show you. I mean, it's six sentences, really, really quick at different signal to noise ratios. So one of them is super easy to understand and then they just get harder and harder and harder till the speech

and the noise is equal and it's a quick score and you find out, okay, I'll just make up a patient there. And this person has a 5.5 dB signal to noise ratio loss. So you get into, how do you interpret that?

Well, most hearing impaired people and Mead Killion actually still working in his '80s a lot. He now even has some new data on around eight dB signal to noise ratio loss is what most people with sensory neural hearing loss have today. So it's kind of right around that eight dB anymore. But it's good to know. And I think it's more important to know probably now than ever, because there are different solutions out there. You have hearing aids that use two microphones to create a beam, that's gonna give you maybe two or three dB better signal to noise ratio improvement. You have four microphone beam forms on the market that are using four microphones to create even narrower beams, that's gonna give you even more improvement.

You have assistive devices like, multi mics and mini mic, spouse mics, FM systems. Even if you go that far, we have different solutions. So it's not just a matter of grabbing a hearing aid with a directional microphone anymore because directionality is different, whether it's a two mic directionality or four mic directionality. And if your patient has more signals to noise ratio loss, you should be giving them the directionality that is the most for that patient. So I will just go on my rant about hearing and noise, but it is the number one problem. And I still don't think that even though we have solutions, I think very many, lots and lots of patients are leaving clinics without things like spouse mics.

They're leaving patients with two mic directionality when they could have four. So I really think we have to look at what we're doing for hearing and noise, because although satisfaction is good, 80% in hearing aids, the biggest unmet need is still and has been for the whole time I've been in this industry, hearing and noise. And we have real solutions today and it should make people change what they do.

- All right, well, I don't know, there's more to add to that other than the test has a lot of face validity for patients. Patients tend to say, "Yeah, that's exactly it, that's when I have trouble." And they really appreciate that. Oh, and Laurel likes to ski. So you weren't opposed to cold weather activities, Laurel?

- No, I forgot about that.

- Yeah.

- I forgot all about the favorite thing to do. So yeah, favorite thing to do downhill skiing, that's my daughter and I.

- Yeah.

- And, of course, vacationing with family, so I'm not opposed to snow. It's snowing right now in Colorado.

- Nice. All right, well, I enjoy skiing too, and I guess I wear the right clothes then, so I'm good with that. All right, moving on to Randy, who's back with us. Hi, Randy from CareCredit.

- Sorry about that, everyone. So in today's economy, how can CareCredit and Allegro Credit be used to help patients move forward with recommended care? That is my question here. And so if you can advance the slide for me. Yeah. So in today's economy, again, whether you're doing over the counter or whether you're doing some more prescription, hearing devices in all the minds, and unfortunately, I wasn't able to tell you a little bit about it from a patient perspective, but it affects the entire family. So quite often it may be a caretaker, a child, a spouse, a spouse that will actually open up a

CareCredit card or get an Allegro loan in order to help their older ones manage with the hearing health that they really want.

And so that's what we do. CareCredit, again, allows folks open up a card or get a Allegro loan in order to enable you to move forward with the care you want by allowing them to say, yeah, there are financial products out there that can help you move forward with recommended healthcare and hearing care.

- That's awesome.

- Yeah.

- Yeah, thanks. You know, it's funny, without what you're describing, without the ability to move forward financially, nothing else we're talking about matters, right? Exactly right.

- So it's really quite the underpinning to the topic. I'm really glad I love the mix today. They're all the different pieces that I think are so important. So favorite activity, and I, like I said, Randy, I'm with you on this one.

- Yeah, so a few years ago I found my inner cowboy. So I always had a love for horses. And so I actually went out and a buddy of mine, he had a horse. I went out and purchased one horse, and now I own two horses. So we love doing that activities. And I like I said, Catherine earlier, if you're at a market for a horse, I have one for you available.

- Okay, then, all right.

- That's what I do.

- We'll talk offline on that. Thanks so much.

- Thank you.

- All right, I'm back to CaptionCall. As you guys know, so many of the things we're talking about are things I use in the clinic every day in favorites of mine. So back to Steve.

- Thanks Catherine. So, yeah, back to CaptionCall, but we are more than just CaptionCall. We're also sorenson.com. Sorenson is our parent company and CaptionCall is by Sorenson. So if I take the definition of individualizing, let's see, what slide am I on here? Sorry, I can't see it. Yeah. Individualizing a patient's care plan to mean tailoring the plan to meet the specific needs of the patient. This can be done by taking into account the patient's medical history, current health condition, and preferences for treatment. So at Sorenson, we offer language solutions to help healthcare services and providers accommodate and connect the needs of all patients, including the deaf and hard of hearing, whether in person or via video.

Our expert interpreters ensure reliable two-way communication between providers and patients. The result, greater accessibility and inclusion for deaf and hard of hearing patients and employees and better health outcomes. So I'll take this opportunity to provide the ADA guideline on healthcare businesses to meet and accommodate deaf and hard of hearing patients and employees. More broadly, the ADA requires businesses serving the public have resources to enable effective communication for people who have vision, hearing, or speech disabilities to exchange information, sign language, interpreting meets not only the needs of the people you serve, but also a smooth experience when hiring deaf employees in supporting daily interaction, along with our interpreting solutions for business, our hearing aid compatible caption phone

service, and video phones for individuals to support a positive experience for patients and employees.

- All right, thanks so much.

- Sure.

- It was nice to wrap the ADA in that too. We need to be thinking about that all the time-

- Right.

- In terms of being advocates for our patients. And your favorite activity is?

- It's disc golf.

- Disc golf.

- But when you get to a certain age, you gotta pick the right sport. I'm pretty active, but yeah, this is fun. Although I did pull up an abdominal muscle yesterday.

- Okay.

- It was that day after this, but it's fun. It's getting out there, throwing disks and it's a lot of fun. It's free.

- Okay.

- And then when you get time, watch that YouTube video, this guy, they have an actual professional league. It's pretty exciting.

- Okay, so I'm wondering, because I have kids, I always wonder like, are there college scholarships? I mean that's really all I care about when I think about sports.

- No, I not that I know of, I would stick to regular golf for that, I think.

- Okay, all right. That's awesome, thanks Steve.

- Sure.

- All right, moving right on to Shannon.

- All right. So I'm talk how Phonak technology and the brand can help you change the conversation from hearing loss as a sensory problem to hearing care is a vital part of healthy living. So the core pillar of our brand philosophy is well-hearing as well-being, and it reinforces the idea that interprofessional context, inspiring individuals with hearing loss to live a life without limitations is what we all do. And to date, I think we still underestimate the impact of hearing loss. And there's significant research that shows that hearing loss is associated with other health conditions that include coexisting or underlying diseases. Well, we all know arthritis, diabetes, and cardiovascular risk. There's tons of research out there that associate higher risk of falls, loneliness, and an overall quality of life with reported under or untreated hearing loss.

- Okay, did you finish Shannon or did we lose you? I know Shannon's had some internet stuff, so I'm gonna show the pictures of her 'cause I just love these and I'm assuming this is her son who has gotta be one of the cutest kids ever. And I love this.

Her favorite thing is hijinks and shenanigans, having fun with the family. Are you back with us Shannon?

- Can you hear me?

- Yeah, I can hear you.

- I am so sorry.

- A final comment you wanted to make.

- Basically, at Phonak, we believe that there are three core dimensions of well-being and they are at the heart of our hearing loss solutions because hearing loss extends beyond hearing sensitivity. And so well-hearing is well-being, but this is hijinks and shenanigans. And that's the fun part, right? We all take life too seriously. And so when I am not at work, we tend to laugh a lot and we make fun of each other, fun of ourselves. But what ends up happening is that picture in the green, and that is my child's second grader. Yep, that is his class picture. So I guess you kind of get what you ask for there. But yeah, he's loads of fun and so I hope he grows up taking life a little less seriously.

- That's fabulous. What a nice message. Very nice message. But hearing and and well-being, certainly a key message. And I'm gonna go over to Catherine from Cochlear for the question she wanted to ask.

- Yes. We all agree that Shannon has one of the cutest little boys ever. But my question was, how do we support hearing care professionals with the growing challenge of improving clinic efficiency and economic viability? So I spoke earlier about our connected care tools and specifically remote care that can help to address some of those needs in the clinic. However, our support and our resources really extend beyond

that. And I think it's important that you know the type of assistance that you can expect from Cochlear. If we can move ahead. There we go. So we're really looking at the complete hearing journey and helping you to really provide the best experience along this whole journey. So if we look at our candidate journey, we actually have engagement managers and what their role is, is to really help candidates to explore different solutions and to connect with volunteers that have a similar story and to really understand, what their outcomes could look like with implantable technology, and post-surgery with that recipient journey, what we offer is something really exciting called a recipient solution onboarding program.

And the objective of this is to really help our newly implanted recipients become confident and self-sufficient at this really important and critical juncture of their hearing journey. The program also offers a recipient solutions manager to really act as an extension of your clinic. So we call them RSMs. We have acronyms for everything. Our RSM or your RSM can come in and really do all of the counseling around new recipient equipment and education, which allows you to become more efficient during your activation appointments and subsequent appointments. And really helping you to know more about these items as well. And really to give you more time back in your day. The RSM program really offers a variety of topic driven group sessions as well as one-on-one appointments.

So you can really kind of choose what you want as a recipient. Once that session happens, the recipient's clinician will get a report emailed back to them so that everyone is in the loop on what happened during those sessions and with patient care. The RSM program also offers an upgrade consultation service. So once the recipient is to the point where they're ready for an upgrade, these individuals can really help them to navigate that upgrade process, which sometimes can be a little daunting and they're offered an opportunity to attend an onboarding appointment with their new products so

they can maximize their technology. So I keep giving you places to go to for more information. This is my last plug.

- That's great.

- I promise.

- Yeah. No, no, I mean, I think that's great. And actually it makes me, what I was thinking of when you were talking is, this session is focused on individualizing patient care, but part of what you are talking about is really individualizing the relationship you have with audiology. So audiologists can take advantage of like your whole slew menu of the different ways you might support them and the patient or not, depending on how that clinic wants. So I just think that's kind of neat, it's like individualization at another level, individualizing to us and then us individualizing the patient. So I just thought that was cool.

- Yeah, it's absolutely what works for your clinic, where can we help, how do we help you with those unbillable hours as well?

- Yeah, yeah.

- Which is really important.

- Yeah, which we all appreciate. Okay, and you enjoy.

- I enjoy travel and I had the opportunity to visit a number of places in the world. I'm a repeat offender of Italy as you can see there. That's one of my favorite spot. I think travel is just so important to me 'cause it really gives me a different perspective and I tend to bring that back into, the work that I do and just the life that I lead. And I think,

yeah, it helps me to see things on a bigger scale and just be more creative and excited about what I'm doing. So that's what I enjoy.

- That's awesome. I love to travel too, but my pictures don't really come out like yours do.

- So that's awesome.

- I got these off of my husband's phone. It's a newer one.

- So very nice. All right, I'm gonna move this over to John now from Audioscan.

- Thanks Catherine. So my question was, time is a challenge in busy clinical practice. I think we've heard this repeatedly during the session. So how does your product or service address efficiency concerns and help overcome barriers to individualized care? And so this is a question I often face as a travel day-to-day and speak to people who are considering whether to include verification as a routine part of their hearing aid fitting process. And when answering, I like to point out that while no doubt verification does take some time, that time upfront can save you significant amount of time in the end in terms of reduced follow-up visits. And a perfect example of this is this paper here from Sergei Kochkin, which many of you may be familiar with, where he analyzed market track eight data from over 700 adults, hearing aid patients where they reported basically what was the type of service they were provided when they were fitted with hearing instruments and what were the number of follow-up visits that they required until they were satisfied.

And so hopefully you can take from this slide here that as we add more and more best practice, so where verification, for example, would be real ear measures and validation outcome measures. As we introduce more and more best practices, the number of

fitting visits until a patient successful hearing aid fitting is complete lessened significantly. Now beyond that, I also like to point out that there have been over the past number of years a number of developments from various verification companies to create verification efficiencies and in many cases increased accuracy of verification. I've listed a number of them here. So, for example, we now see software assisted Probe Tube Placement features in our version of that being ProbeGUIDE.

So that ensures you have that Probe Tube in the proper location so your measurements are accurate, and therefore your resulting decisions are as accurate as possible. We also see refinements in simulated real ear measurements in the test box. And so this would be an example where we're incorporating RECDs MLEs and we've recently introduced some new venting corrections to further enhance the value of this feature, specifically as it relates to refitting hearing aids for all patient populations. We see automated verification to target technology or auto REM fits and our version of that being VerifitLINK, where the fitting software and the verification system, in this case, Verifit2 communicate with one another and the fitting software actually will adjust for you automatically to target.

And we see from the research literature significant improvements in target matching relative to first fits in equivalent to experience clinicians, but in significantly less time. In addition, there's the simultaneous bilateral measures I touched on earlier. All of this, if we think of a kind of a typical verification fitting, you're looking more or less at time, 10 minutes or less, what I would say, if we considered 10 minutes relative to all of the benefits I touched on earlier, that's definitely time well spent.

- Thanks, and your favorite activity?

- Yeah, so my favorite activity, it was tough to pick one and there was, there's quite a few but I would say hiking. So it's nothing like getting outside in the fresh air and

clearing your mind. I think this was a shot in Grand Lake, Colorado. I like to say it's in my backyard, but I'm living in Texas right now so we don't see mountains like this. But the other fun part is if you look way off in the distance, there might be a pub there. And so that's kind of my second favorite activity after hiking is to quench that thirst at a local pup so.

- Ah, that's awesome, thanks John. That's great.

- You're welcome.

- All right, and Dave, you're gonna bring it home for us.

- All right. So yep, I'll have to remember to be nicer to you next time Catherine. So I'll bring up the rear. Brian set me up perfectly for this by mentioning ChatGPT. It's the latest AI buzzword if you will. It's open access AI algorithm for going in and querying about anything. You can ask anything you want. And my question then is, will it eliminate the need for the professional to assist with individualizing, personalizing hearing aid fittings to sort of address that fear factor? Like I said, it's open access, you can go and you can enroll, you can hear some examples, capabilities, limitations, and I'll point to one limitation. Right now AI is, and machine learning AI but any AI is really good at going out and mining all of the data that exists on the internet.

I asked the question of what significant events occurred in music on February 15th and every search is a little different. So if you recreated this search now based on the engine that it had available at that moment, it would be different. It would learn on the basis of my input and the way I phrased the question, but it's garbage in garbage out. Of these six answers that they gave me, only one is the correct date and that is the question as it related to the Beatles on February 15th, 1965. All of the others, if anyone at any point in time, put something on the internet with the wrong date, the search

engine would find that. And if it found multiple examples, it would come up with an answer.

So there still is no replacement. I say there's artificial is no replacement for natural stupidity of which I embody that. And so an AI algorithm is only as good as when it can search. But I also ask how will AI assist with individualizing hearing aid performance? It did identify areas of opportunity where it can augment what we can do in the role of the professional for customization, real-time adjustments, improving sound quality by managing noise management and gain settings in a way that can be personal to each individual end user than the last predictive maintenance. In terms of, we have a self-check algorithm that can enable a hearing aid user to go and test at any moment in time.

Whether the microphone, the receiver, the circuits are functioning properly. But we can automate some of that in the future to again, not replace, but augment the role of the professional. And interestingly, when I asked what is the best hearing aid for me? It came back with this answer. That it's not able as an AI language model to determine the best hearing aid, but it did point to going to see a licensed audiologist or hearing healthcare professional, which I was encouraged by. So even ChatGPT doesn't think that we're on the verge of extinction.

- All right, and I'm afraid to ask, but Dave, just in 30 seconds or less, your favorite non-work activity?

- Well, you might think by my health history that I am, my favorite activity is to slowly become a cyborg. These are all actual X-rays of mine. I have more replacement parts than the \$6 million man right now, but I'm going for the record. But my actual favorite activity is travel. Like a couple of the previous presenters indicated. I've traveled the world on my ears and been a better person as a result of it and made some of the best

friendships that I have. I've had the opportunity to travel for work and for pleasure, I've been on six continents with my wife. Our aim is seven continents before incontinents. This is a picture of my new son-in-law, and he's a little different than the Packer fans in the picture. His only real flaw is that he's a Viking fan, but we're expecting a new grandbaby in May.

- Oh.

- So that will undoubtedly be my favorite activity next year.

- Well, that is news to me. Congratulations Dave, and what a lovely way. We're gonna wrap it up on that. The world's a special place and having a grandbaby is certainly very special. I wanna thank the entire panel. I really appreciate your time. I appreciate the hosts at AudiologyOnline who make this easy. And thanks to all of you who hung out with us today, I appreciate it. I feel like we had great information and maybe we'll see you next year. Thanks everybody.