Improving Patient Engagement Through Evidence-Based Care

Presenter: Brandy Pouliot, AuD

Hello there. How are you? Welcome to this webinar. We'll we'll be talking about how you can improve your patient engagement using some evidence. And before we dive right into it, there are a couple of houses keeping things going on here.

I do want to let you know that my name is Brandy Pulliot. I am employed as the Director of Audiology and Education for Sonova us. I have no other financial or non financial disclosures to review with you. And when we take this course today, there are going to be some learning objectives. Of course I want you to be able to describe the three types of stigma, want you to explain the role of empathy in patient interactions and list some tips for providing some more empathetic hearing health care.

Without further ado, let's get started. You know, we can talk about well being in this overall overarching well being and it can be understood as the state of life satisfaction and overall quality of life. It's not necessarily meaning the absence of a disease process but but it's a way that it is an active process where it can engage our physical, our psychological, our social and emotional well being along with other dimensions. And if you think about the auditory wellness concept, hearing health is not defined solely as a pure tone audiogram. It still tells us stuff about the physiologic system and the sensitivity of hearing, but it doesn't fully capture everything about the personal impact of hearing difficulty.

So we need to embrace this holistic approach to hearing health care so that we can not only help people hear better, but they can understand speech in conversation. They can localize where sounds are coming from for safety and orientation. They can appreciate those complex non speech sounds like music or nature. And the focus on hearing well and healthy aging. This is the phonak difference that we're going to be talking about today.

And we're going to talk about how stigma plays a role into into some of this and how we as providers can can play a critical role in our patients overall well being. Right. Their social wellness depends on our ability or their ability to stay connected, to communicate effectively and have meaningful

conversations. Right. And it does become more difficult as hearing loss happens.

So if we take one step further, we can look at this recent published study and it compared patient and provider attitudes toward toward the role of the hcps in addressing health domains. In the finding here, it suggests that patients may expect HCPs to have a responsibility to address health domains beyond hearing. So if we take a look at the five domains across the X axis, we've got cognitive health, social, emotional, Health, physical health, mobility and balance and overall wellness. You can see here that looking at over 1400 patients with upcoming appointments and 94 HCP, so a really good robust number of individuals, colleagues of yourself. And they were asked about the different five health domains and whether or not the HCP should be addressing any of those things.

So the patients in this study, they appear to expect a holistic approach to hearing care and it weighs cognitive health, socio emotional health, physical mobility and balance equally. And you see there is a little bit of a mismatch where in some aspects you, the providers are like, oh yeah, like we definitely need to provide information on cognitive health and social emotional health. But you could see here the physical health and mobility and balance didn't necessarily come across as, as, as important for providers over than over the, the, the patients that would expect it. So we're going to talk about some insights into all of these domains. So over the course of this next, you know, period of time together we're going to look at how hearing and healthy aging or hearing and well being are connected.

We'll introduce a framework for understanding not only the impact of hearing loss, but the barriers that exist to seeking care and then the real world benefits that hearing aid users can experience. And we'll start with some background on aging. Now these numbers are not new, but it's always important to think about the population with whom we work. And the population numbers are important to understand. And first, there's this global growth of population in general and There are currently 8 billion people living in the world and this number, number is growing and there will be 10 billion people

by 2050.

Secondly, there's growth of the aging population. People are getting older and they're living longer. So the population of older persons is increasing both in numbers and in share of the total. So by 2050, the number of adults, so 25, zero. The number of adults older than 65 is going to double and the number of adults older than 80 will double.

And this is why we often refer to aging societies because the aging population is growing at such a fast pace. We have got advancements in technology, advancements in health care and in healthier living that have significantly increased global life expectancy. So we also have this challenge with, with not having enough time or enough HCPs to care for this growing population. However, you know, the focus shouldn't be solely on extending the total number of years a person lives, but prolonging the healthy years. So it's what we call the health span.

And in the field of longevity research, the focus is about maximizing the quality and vitality of life, not just making life longer, but actually giving healthy years a nice big chunk of it.

Our primary goals include developing a deeper understanding of the biological aging process and explore strategies to delay or even reverse age related diseases. The ultimate aim here of course, is to enable individuals to enjoy a longer, healthier and more engaged life.

So when we take a look at research around the quality of life and well being, it shows that these concepts go far beyond just again, the simple absence of illness. It is the feelings of happiness, of life, satisfaction, of engagement, as well as the realization of one's own potential. And those are really all essential aspects of life living well. If we take a look at, excuse me, healthy behaviors for a second. So taking a look of that, you know, take a moment to review this list here and you know, it's a pretty exhaustive list of things here that we know may cause thing cause people to be unhealthy, right?

If you had to chop top choose, excuse me, choose the top two, two, what would they be? So just, you know, think to yourself what are the top two things that would be the most important to better living? Right. We're just talking about overall living here. And actually the University of Queensland, they ran a study to get a handle of the importance people place on health and social behaviors.

And they found that while, while people generally understand the benefits of physical health behaviors, they don't always recognize the benefits of social behaviors.

So interestingly, the evidence from research tells a different story from what most people understand. So you know, if you asked your patients what are some of the things that were the most important to staying staying healthy, they may say some of the things that you pointed out at first. But the single most important factor for maintaining meaning good health is being socially integrated. It's having strong connections and active participation in social life. It's, it's following this idea of having a robust social support network and social support and being socially integrated, they can continue to emerge as more influential than many of the risks we typically think of first when we think of not aging well or not being healthy.

Julianne Holt Lundstadt and her colleagues did a meta analysis and they assessed 148 studies. So this is a really robust study. The data was across almost 309,000 individuals followed for an average of seven and a half years. And what it indicated was that individuals with adequate social relationships have a 50% greater likelihood of survival compared to those with poor or insufficient social relationships. Are you hearing this right?

These are like some of the strong things to talk about with your patients, you know. This finding remained consistent across age, across gender, across sex, across initial health status, cause of death in the follow up period. So it indicates that the influence of social relationships on the risk of death are

comparable with well established risk factors for mortality like smoking and alcohol consumption, and actually exceed the influence of other risk factors such as physical inactivity or obesity. So the authors actually commented that health professionals such as ourselves, educators and the public media take risk factors such as smoking, diet and exercise seriously. The data presented in their study make a compelling case for social relationship factors to be added to that list.

Do any of you out there prescribed social interaction for their patients that are just getting their hearing instruments? It is such an important thing to be able to do, right? To give them the tools by hearing better with great hearing instruments, but then giving them the impetus, giving them the permission and encouraging and motivating them to go out and be social beings. Right? We are inherently social beings.

Our attitudes and beliefs are shaped by the people around us. We care about what people think about us, admittedly sometimes too much, and what people think about us and how they care about us. It influences how we see the world in ourselves. So relationships aren't just pleasant additions to life, they're fundamental to our well being. They contribute to life satisfaction.

They foster positive emotions and help protect us from negative feelings. Language, communication and the exchange of ideas are essential tools in building and maintaining these relationships. It reinforces the fact that connection is at the heart of human health and happiness. Right? Our individuals that come in with challenges, they often say, you know, when you ask them what they want to hear, they want to hear another person.

They want to hear them in a variety of situations. They want to be able to commute, communicate, excuse me, and hearing is the first stage in a precursor to listening, to comprehending, and to successfully communicating. So it so being able to hear provides that foundation for your patient's communication and social functioning. So I'm going to shout out a couple of quiz questions here. You

know, like if you think about it, whose biases impact how a patient and a provider communicate with one another?

Well, both the speaker and the listener, right? The listener, the patient and the speaker, the hcp, or vice versa. They both have biases that are going to impact how we communicate with one another. Another quiz shout out here is the Picker Institute identified emotional support, empathy and respect as principles of person centered care. Our patients come to us with very individual needs.

They're shaped by their personal circumstances, their lifestyles, Their life stories. And in our daily work as a clinician, our role is to recognize these differences between our patients, to listen carefully, and to provide solutions that meet each person where they're at. Now we know that hearing loss, having the challenge of hearing and therefore comprehending and having a good communication hearing loss can have this cascading effect and it can make listening and communicating feel like hard work. It can be exhausting to try to hear through a hearing loss. It can be exhausting to try to understand in a very noisy environment when there's other things happening and you're trying to.

To stay in with the conversation. So when communication becomes more effortful, your patients might reduce their social engagement so they're not hearing well, they reduce their. They reduce their communication, or they have poor communication quality, they have poor environmental awareness, they become more tired, more effortful in listening. It can cause anxiety and make them feel like there's hard work. Therefore, we know with some hearing loss, you can have challenges with maintaining your attention.

Hey, I'm in a noisy place and I'm hearing that. Table three, table that person three tables away. I'm hearing everything else and I'm not able to concentrate. It's going to affect the working memory. We're humans.

If things aren't easy, we stop doing them. That's just how it works as a human being. If it's difficult to hear, understand, and communicate in social environments, we're going to start withdrawing. We're going to reduce some of those activities of daily living. We're going to restrict ourselves in the world, and therefore we have this reduced quality of life.

Now, many of you have probably seen that day and day out seeing patients that overall there can be this great cascading effect where hearing loss, you fit them with hearing instruments and all of a sudden they become this completely different person. Or family members are like, I didn't even know this person existed anymore. There's just the ability, through hearing better to be able to improve overall quality of life. And if we take a look at this cascade, we're going to look at it in a different format here. So we're going to look at this holistic view of hearing care.

We can think of it in terms of several connected dimensions. They're represented here in this pyramid. At the bottom, we have audibility. So being able to hear all the way up to quality of life. There are two sides to the pyramid.

On the left side in gray, we see the growing body of evidence about the negative consequences of untreated hearing loss. Right. We know that untreated hearing loss reduces audibility, therefore it reduces speech intelligibility, increases listening effort, we start having cognitive decline. There's a link between untreated hearing loss and a higher risk of cognitive decline. We know that individuals with untreated hearing loss tend to move less and are more likely to withdraw from social interactions.

So this holistic perspective makes it really clear. Untreated hearing loss has far reaching negative effects all the way up to the quality of life. On the other hand, there's another side. Timely and effective hearing care can positively impact multiple dimensions of health and well being. If you can hear well, so you've got audibility, then you've got some better speech intelligibility, it's going to reduce the listening effort and free up some cognitive resources.

You're going to be able to move around the world more easily, have better social engagement, and therefore improve overall quality of life. Now, before we get into the benefits, let's explore the challenges. And these are the things that may prevent people from moving from that left side to the right side of the pyramid, where the benefits are explained. And some of the challenges to the successful hearing health care can include, you know, have, number one, access to services. Is there access to it?

We know there's a shortage of hcps and there's a growing number of individuals that need our support. And can people access your services? Do they have a perceived handicap? Do they think they have a challenge in their hearing ability? How about trust?

Trust is really important and it's important to understand why. Building trust can ensure that patients can understand the benefits of hearing aids. Beyond just that, audibility and speech understanding. We have stigma, of course, there can be emotional resistance, there can be just lack of awareness about the potential benefits of hearing health care. So there are a lot of different challenges you see day to day.

Some of your patients come with all of these, some patients come with just one or two. And your role as the HCP in your building rapport and uncovering challenges is to determine what are some of the barriers that you're going to come up against and how best can you motivate somebody to take action and adopt hearing health care and adopt a treatment protocol. So let's talk about perceived handicap. Right, we'll start there because access to service is certainly something that we know can be a challenge and we're probably not going to solve that here. But let's talk about perceived handicap.

So usually when people think of the most common group likely to adopt hearing aids, you probably think that it's because of, because of their hearing loss, Right? Well, it actually turns out that hearing

loss can be a good predictor of hearing aid uptake. We see that more. If you've got a lot of hearing loss, you're going to probably adopt hearing aids. So like a severe hearing loss, you're going to adopt hearing aids.

More so with the people that are just kind of in the middle of the road, like they're mild to moderate, they don't really know if they need hearing, hearing help or whatever. But a better predictor is of whether or not they're going to adopt hearing instruments is how much a person feels they have hearing loss. So knowing how people feel about their hearing loss is really important. It's a good information for you as a provider to collect. And there are a lot of different ways to collect hearing handicap scores.

But one interesting single item question is used by Palmer and her colleagues out in 99. She posed this simple question. On a scale of 1 to 10, 1 being the worst and 10 being the best, how would you rate your overall hearing ability for this single item? People at the extremes have less uncertainty regarding their purchase, behavior, decision. So if they 1 to 5, they're most likely to purchase, so they're ready.

So 1 being the worst, 5, 10 being the best. If they say that their hearing is pretty poor, they're probably going to be ready to get hearing instruments. If you've got somebody on the other edges, the 8 to 10, no matter what their hearing loss says. So you could say, ask this question. Somebody say, my hearing's a nine, I hear everything.

You could get them in the booth and they could, you know, have a moderately severe to severe hearing loss. And those people are probably not going to purchase hearing instruments. But the group in the middle like that, six to seven, there are some additional factors that are going to come into play because people with this rating of their hearing abilities, they experience a decision fatigue or ambiguity, right? Sometimes they feel like they could use help and sometimes they feel like they don't need help. So knowing their perceived handicap can give you a nice indicator for understanding patient motivation.

And it's a starting point for an additional conversation. So the more significant the poorer people rate their hearing, the more likely they are to adopt hearing instruments.

Now that slide just showed showing self related hearing or hearing handicapped.

But there might be something else that is an interesting question and it might be predictive of hearing handicaps. So this study here highlights an interesting complexity. How prone is someone to get bored? Right. If we look at this graph, participants are clustered into four groups with different levels of audiometric hearing.

So orange, orange is normal hearing, purple is the worst hearing. Okay, so you can see some gradients in between it. And what we see is that those who are more prone to boredom, so that's going to be over to the right on the x axis, are more likely to experience more handicap from a given degree of hearing. From any given degree of hearing loss. Okay, so if we take a look at this data for all four people, all the four lines, we see that as a person reports being more easily bored, there's a tendency to people, for people to report increasing subjective handicap from their degree of audiometric hearing loss.

So it prompts us to find out more information about our patients. Do they tend to get bored more easily? If so, they may be experiencing more hearing handicap. One way to help a person who experiences boredom more easily is to deliver more stimulation to them.

So what do you do? You give them hearing aid use compared to no hearing aids. And it can help us get some more information. Pretty interesting.

Next, let's talk about trust. Okay. There's a lot of sociological data that tells us something we probably all intuitively understand. Compared to the past, the world is far less trusting today. Of course there are

nuances around this, but the general pattern, whether it be business, media, education and even healthcare, is that people are less, less trusting of others.

And so Lowe's study explored the relationship between trust and the decision to purchase hearing aids. And there were a few notable patterns. So patients who trust their HCP are more likely to purchase hearing aids. More importantly, the relationship between trust and purchase decisions is particularly robust for one group. So a few slides ago we talked through hearing handicapped being an important predictor.

So people with lots of handicap are far more likely to purchase hearing aids than those with moderate and especially those with low hearing handicap. And as it turns out, the trust that a patient has towards their HCP is really important for individuals in the middle group.

So if you look at the blue line on the graph, specifically if a person's on the fence, so that mild to moderate handicap, if they're on the fence about purchasing hearing aids, one variable that can really tip them over to adopting treatment is the extent to which they trust their hcp.

Very important to establish trust and rapport when working with the patients in your clinic. We also should consider some emotional barriers. And here you see the surveys from a cross sectional survey used to investigate the reasons given for the non use of hearing aids. So from the people that have hearing loss on the left and from the Family members on the right. Now, this was looking at individuals across Australia, the UK and the usa.

And the results are broken down by those who have never used hearing aids and those have had hearing aids use them but were unsuccessful. So starting with the non users, the survey results showed that the generally cited external factors as reasons for non use. Okay, well no one ever suggested I wear hearing aids or I cannot afford hearing aids. However, the family members reported

non use due to attitudinal behaviors. They don't think they need them or they would feel old wearing them.

So there's a bit of a difference between what the non user perceives and what the family member perceives.

Now, if we look at past users of hearing aids and family members, you'll see something a little bit different. So the differences in the reasons for nonuse may provide further clinical insight from researchers, for researchers, and for you. Also, you can see here, these people wore hearing instruments and then stopped using them. And the people that did so, they said, hey, they didn't feel comfortable in my ears and I didn't like wearing them. Look, the family member said the same exact things.

So for those individuals that come in, so your patient comes in with family members, ask them the questions too. Also they may give you a completely different view of the experience that their family member is going through. So stigma also becomes, also remains, excuse me, a barrier to hearing health care. Right. Stigma is an attribute that results in a person being categorized as different from others and maybe even discredited for that attribute.

So people may have stigma relating to hearing loss, hearing aids and or aging. And it can likely prevent people from dealing with their hearing aids. So hearing aid purchase rates are lower actually for individuals who report more stigma to hearing aids. Probably makes sense, right? And when we think about stigma, there are three types of stigma.

So there's public stigma. So this could refer to the negative attitudes, the beliefs and discriminatory behaviors that society may hold towards individuals. There's systemic stigma. It can also be called structural stigma. And it refers to any laws, policies or institutional practices that systematically

disadvantage certain groups.

It creates barriers that individuals cannot over overcome through their personal effort alone. No matter what they do, they're not going to overcome it. And then there's self stigma. And it's that internalization of negative stereotypes or thinking about all of the judgments that society may have about yourself. And it occurs when an individual accepts and agrees with the prejudicial beliefs held against them.

So it can lead to damaged self worth, it can increase shame, it can reduce the likelihood of seeking help. And some of the stigma is wrapped up in self stigma, especially into whether or not people divulge to others about their hearing loss. So let's take a look at we've got persons with hearing loss and what they do is they respond to stigma and they may see, say because of the stigma they feel, they may not disclose their hearing loss. So they might just be like depending on situational cues to try to fill in the blank. So what this multidisciplinary team of researchers looked at again at the University of Queensland, they looked into the stigma experiences of adults with hearing loss.

And after a first qualitative study with adults with hearing loss, their family members and HCPs, a second phase of the study involved online surveys with people with hearing loss over the age of 50 in Australia, the US and UK. And within this group were people who had never worn hearing aids, those who now wore hearing aids and those who had tried but were no longer using hearing aids. So we've got these three buckets of individuals and the international survey found that stereotypical beliefs, experiences of discrimination and personal characteristics act impact both the disclosure of hearing loss as well as the decisions around hearing aid use. So if you look about this at this, about half of the participants, so 54% reported disclosing their hearing loss to specific people, most commonly their immediate family, which was 90% of that, close friends, 70% of that, so they were disclosing it, but mostly just to immediate family and close friends. Only 37% disclosed the hearing loss to healthcare professionals or receptionists.

And just under 27% said that they would never disclose their hearing loss to anyone under any circumstances.

It's staggering to think about there are so many individuals that are walking around in your clinic, coming to your front desk, not disclosing that they have a hearing loss. Only 37% of them are. Now when these the study participants were asked, 57% of them reported that they thought other people laughed about or treated their hearing loss as a joke.

So what did they report? They reported that it mostly made them feel uncomfortable and frustrated. So we need to find effective ways to talk about hearing loss. So we need to be able to give our patients the tools to talk about their hearing loss so that they can decide when and where to share their, you know, their hearing challenges. And it's just wild because you take a look at where a lot of the, the misunderstandings happen for people with hearing loss, especially untreated hearing loss.

And it's in doctor's appointments and my heart is just aching for you know, patients that go in, don't treat their hearing loss and then go in for, you know, important medical conversations and don't disclose their hearing loss and miss a lot of the information. Little heavy here. There are good questions. Okay. There are good, you know, a fortunate side of this.

And fortunately we see that stigma related to hearing aids is less than stigma related to hearing loss. Right. And if we take a look more closely at attitudes about hearing aids specifically, we see that overall, most participants reported having a more positive attitude towards hearing aids compared to how they perceived the general public's attitude. So they may say, hey, you know what? I think hearing aids are discreet, they look small.

And look at this, over half of them said that they're beneficial. And that is just so powerful to see individuals that are able to see the benefit of modern hearing instruments and the improvements in our

hearing aid design and technology may actually, you know, be helping. You could see less than 25, or about 25% of the participants perceive that the general public associated modern hearing aids with looking ugly or visually unpleasing, being obtrusive, and being part of everyday life over the age of 50.

There are certainly media representations of hearing aids and hearing loss that have not been favorable of what they look like or the benefits they can provide. But more and more, you're seeing individuals that are just wearing hearing instruments and nobody's even talking about it. It's just normal for them and they're successful individuals. Another piece of literature around all of the barriers and the things that make it easier for people to either reject hearing health care or adopt hearing health care. It's the critical role of the family members in the rehabilitation process.

Right? We know that the family, it's support, the family having support, it drives help seeking for hearing impairment, and it also helps with people staying true to their, their treatment protocol. We know that individuals are significantly more likely to adopt hearing aids when they're accompanied by a significant other during their audiology appointments. And it's particularly robust for those people with milder levels of hearing loss. Again, those people with mild to moderate hearing losses that are like on the bubble, right?

They're not sure if they need help. Trust is going to help knowing what their self perceived handicapped is. Having a significant other and incorporating that significant other's mindset and views on the world into the appointment is going to help improve the adoption rate. And it's going to allow you to have somebody on your team, that significant other, be the cheerleader and help remember information and help keep that person wearing and motivated to continuing their treatment protocol. So significant other others not only help get hearing aids onto a person with hearing loss, they can also help a person be more satisfied with those hearing aids.

So there have been studies showing that the more social support somebody gets, the more satisfied they are with their hearing instruments. And if we take a look at a qualitative study looking at open text responses from a large scale survey over 642 hearing aid users in the US and these are both prescription and OTC hearing models, and it identified what motivated uptake from the user's own perspective. So why did you adopt hearing instruments? And the decision to take up hearing aids included intrinsic factors like am I really ready to change? And extrinsic factors like am I able to afford this?

And what it looked at was three main domains that drove hearing aid uptake. You could see social difficulties, so having challenges in social settings, auditory difficulties, not being able to hear and not being able to, you know, have a great experience, be entertained, be able to be part of a group involvement. And then the personal impact in the ability for an individual to have barriers removed, have their education or work improve, and have a benefit for an emotional impact. So support should address all three of these domains. You know, how is it going to support somebody socially auditorily and then personally, not just the cost or the technology.

And the most frequent recommendation to others was not to delay seeking hearing help and to get hearing aids. In fact, we've seen this, We've seen the wait time to get hearing instruments decrease from six years to four years between 2019 and 2022. So this has to indicate that patients are getting over barriers. One of the potential reasons identified is that there's educational efforts and media coverage highlighting the link between untreated hearing loss and comorbidities like social isolation, depression, cognitive decline and even dementia. So understanding the research and confirming the link and the association between hearing aid intervention and overall well being that we're discussing today could really help you educate your patients and decrease this wait time even more.

And if we look at perceived benefit, we see some really positive news here too. So this was another large scale retrospective online survey of over 2100 hearing aid users. It was recruited via Hearing Tracker and the Hearing Loss association of America. And it gathered information on demographics, self perceived hearing loss, device characteristics, service delivery type, cost and self reported benefit and satisfaction with hearing aids. So participants highlighting favorable sound quality important, right?

It's gotta sound great. It's also favorable fit and comfort, feeling really good in the ears and battery life tended to report greater benefit from their devices and greater self perceived hearing loss was also associated with greater reported benefit from their hearing instruments. Of course, makes sense, they've got, they perceive more of a loss, they're going to see a really great benefit. So you can see here, the majority of individuals that chose to wear hearing devices received a benefit, a fair, good or vast benefit. With a majority of individuals having a good or vast benefit, therefore being more satisfied with the hearing instruments and also being very happy with the way that they've improved their overall quality of life.

So let's talk about some real life benefits of hearing aids. So we're going to get into some specifics of real life benefits and what we can do, what we can, you know, give to our patients in order for them to hear in a lot of these situations that they want to go into. And also how do we fulfill this, this pyramid? Right, so we're going to work our way up the pyramid starting with speech understandability or intelligibility. Right.

So speech understanding, it's not just a matter of having a conversation one on one in a noisy place. We know that there are so many situations where we don't take turns. So speech is overlapping, speech is coming from different directions. And it can challenge to not only normal hearing individuals, but especially a hearing aid user. And so hearing aids have traditionally been designed to prioritize the speaker who's directly in front.

That's what directional microphones have been so good at. But with the introduction of spheric speech clarity with Infinio Sphere products, it extracts speech, enhances and integrates it back into the signal, regardless of direction. And it's really open new ways to manage noise. And in a series of studies we've examined how speech intelligibility with spheric speech clarity compares to other advanced directional technology. You know that stereozoom that you see in your eye 90 it is that more of a very strong directionality pattern with noise cancellation from the sides and back.

And first, what we looked at in this first study we looked at speech understanding for speech to the right and to the left. So we've got, on this first bucket we've got off axis speech. So coming from the sides or coming from the front, front. And if we take a look at that off axis speech, what we see is this, that first set of bars here when speech is coming from directly the front. So 0° azimuth spheric speech clarity and stereo zoom work about the same.

And that makes sense, right? It's where the speech is Coming from narrow beam of directionality for stereo zoom as well as spheric speech clarity working well, what you can see here though is as the speech gets off axis, the ability for somebody to hear better, have better speech intelligibility is improved with spheric speech clarity over our directional microphone technology, stereo zoom. So for individuals that want to hear in a variety of situations with, with speeches coming from off center, off access, excuse me, and not from zero degrees. That's where your spheric speech clarity, your sphere devices are going to work really, really well. Now if we take a look at the other thing, the next thing is this overlapping voices right here.

So conversations are dynamic, right? They, they often lack clear turn taking. We don't always wait for somebody to finish talking before we jump in. And so we wanted to understand how spheric speech clarity contributes to speech understanding when multiple talkers are overlapping with one another. So we assessed speech intelligibility.

First sentences, they were presented at random from three different loudspeakers and noise was coming from all around. So you can see the three loudspeakers in this middle overlapping voice. But there was noise coming from all around and there was a short overlap between adjacent sentences. So what you can see on the left panel of this graph in the middle here, it shows the distribution of scores in percent correct for each condition. The panel on the right shows a distribution of the different scores.

So anything above the dotted line at zero means better performance with spheric speech clarity. So as a group, these participants were performing, performing significantly better, almost 20 percentage points better with spheric speech clarity than they were with the speech in loud noise or directional microphones. Stereo zoom present. So you can see again, spheric speech clarity is going to give you an increased advantage over stereo zoom in hearing and understanding overlapping voices. And this is really quite, quite a real life event right now.

The next thing is we've got spatial speech intelligibility, right? So this is, you know, think about a cocktail party and it has to do with like speech location. So you're in this real life situation like a cocktail party, and you really can't predict with certainty where the next thing you want to listen to is going to come from, right? So in this study, sentences were presented from five loudspeakers spaced equally across the front hemafield and the background noise was presented from all around. So this was an adaptive task.

So the level of the noise was fixed and then the level of the sentences decreased and increased to reach an SNR50 and SNR50 is where the signal to noise ratio at 50% of the speech can be understood. So you're looking for like 50% speech understanding. So it can be a really challenging task. And we also had a unique twist to the methodology. Instead of presenting the entire sentences from one of the speakers and then the next sentence from a different speaker, each word of the sentence was presented at random from a different speaker.

So it was the participant's task to repeat the entire sentence at the end. And if we take a look at the results here, the panel on the left is showing the distribution of scores. And since we are using a threshold measure here, lower is better. It means that the listeners were able to understand the sentences at a more challenging snr. And by that same logic, anything below the dotted line at zero in the panel on the right indicates better, indicates better performance with spheric speech clarity.

So what these all of these results show taken together is that in a fast paced, dynamic environment, spheric speech clarity is going to help patients hear more of the conversation. Now, ease of listening is important, right? It's part of reducing listening effort for our patients. And we wanted to know how hearing technology can make a difference here. So in this specific study, we wanted to determine whether a reduction in listening effort with speech enhancer.

And we had obviously, sorry, observed this previous studies for speech at varying distances. So we wanted to measure the perceived listening effort. And so we, we took at, we looked at 22 adults. You can see they've got mild to severe hearing loss. And they were presented with Oculus test.

And the way that the Oculus test works is that the participant has a tablet or a computer touchscreen in front of them with this vertical scale on it. And you can see the vertical scale, like, how effortful is it for you to follow the speech? And they'll listen to three short sentences presented one after the other. They don't need to repeat anything. They just rate their listening effort for that group of sentences on this scale from effortless to extremely effortful.

And the listening effort was assessed when sentences were presented from a loudspeaker positioned 4 meters or about 12ft away in the same room. From a loudspeaker, From a loudspeaker and also from a loudspeaker set up in an adjacent room with the door between the rooms left open. And this is to simulate a common use, common use case that might happen in a quiet, in quiet, like at home, where people are like, I want to hear from, you know, somebody in another room.

Speech enhancer is available in our 90 level hearing instruments. And what speech enhancer showed was a significant reduction in perceived listening effort for distant speech. So when averaged across all three listening conditions, ratings of listening effort were 39% lower with speech enhancer activated compared to disabled without it. So the same was true for speech from an adjacent room. Perceived listening effort with speech enhancer was on average 45% lower without it.

We also have a lot of data on listening effort in noise, but we're going to build up on our pyramid and go into cognitive well being. And it's an area of growing interest in the past few years. If we take a look at the Achieve study findings, it's comparing hearing intervention with a successful aging program in two different cohorts. And what the participants in the Achieve study showed was that with older adults with increased risk for cognitive decline, the hearing intervention wearing hearing aids slowed down loss of thinking and memory abilities by 48%. So impactful here for individuals that had no other comorbidities or no other risks for cognitive decline, they had no declines in their memory over the three year period which you'd expect.

Over three years you should have a drastic change in your memory. And so the Achieve study postulizes that treating hearing loss in older adults at increased lift risk for cognitive decline slows down loss of thinking and memory.

Another dimension of well being is physical well being and being confident in your space. Also from the Achieve study it looked at a secondary analysis and the impact of hearing intervention on falls in older adults. And we know, you know, we're well aware that hearing loss has been associated with increased likelihood of falling. We also know that falling risks for patients of older ages that we're seeing can really be so detrimental to their overall well being and overall health and mortality. What they found with this intervention group was that There was a 27% reduction in falls over the three year study period.

And results were consistent across all of the different populations whether they were at risk or not at risk here. So the team at the Achieve team, they hypothesized that the beneficial effects from hearing intervention on reducing falls may be from advanced or enhanced awareness of the spatial environment, being able to hear around reduce effort in listening. Therefore your cognitive resources can be freed up from for things such as orienting yourself to your physical space and maintaining postural balance. So we've got some really great information when it comes to physical well being. And Achieve also has some some great findings when it comes to social network.

And what they found was that when the loneliness was assessed during the UCLA using The UCLA Loneliness Scale. It was measured at baseline and at the six month, one and two and three year follow up also. And the hearing intervention group showed a modest reduction in loneliness compared to the control group. However, the authors note that this change, while still statistically significant, may not be clinically meaningful. The intervention was described as scalable and low risk with potential for population level impact on reducing social isolation and loneliness.

So wearing, wearing hearing instruments certainly can reduce that feeling of loneliness. And Holman and colleagues indeed looked at an intervention group who were due to be fitted with their first ever hearing aids and then a control group who had hearing loss but no change in hearing aid status. And they all completed a battery of self report outcomes measures four times and a self report outcome. And they found that hearing aid fitting led to a significant reduction in listening related fatigue. Also, social activity level increased and social participation restriction decreased.

So they were able to have better social activity and were able to move around and not be restricted by their social activity. So knowing the importance of social well being, it's nice to see more data on how hearing intervention can positively impact these areas. So as we wrap up today, you know, we've explored all different parts of the overall quality of life and how there's a cascade effect not only down

for quality of life but also up in this pyramid. And when we are able to hear well, we're able to understand speech, have decreased listening effort, therefore freeing up our cognitive resources, allowing our bodies to move more freely in space, allowing us to socialize with those we want to socialize with, and improving our overall quality of life. So first of all, what effect can a provider's choice of language have on stigma?

You know, it can reduce it or it can validate it. Words matter. So some things that you can do tomorrow recognize the importance of trust of your patients and what they expect you to do, which is address multiple health domains. Ask your patients and their family about how they would rate their hearing ability and how they feel about their hearing loss. Help patients learn to tell others and talk about their hearing loss in their own way.

Maybe it's using humor, maybe it's using, you know, in a story and talk about hearing health and frame counseling and technology recommendations around the real world. Benefits of hearing care and hearing aids from audibility to quality of life it's important that you leave here feeling comfortable with having some of these first step conversations. Where would you perceive your hearing as on a scale of 1 being terrible, 10 being great? Establishing trust. Asking patients if they would ever disclose their hearing loss and then giving them the tools in order to be able to do so and being able to usher them and their family members through the journey of better hearing.

Thank you so much for your time today. Let us know if you have any questions. You can always reach out to your Phonak representative. Have a good day.