Improving Adult Hearing Care in the U.S. Through Multidisciplinary Collaboration, in partnership with the American Academy of Audiology

Presenters: Sarah Sydlowski, AuD, PhD, MBA, Erin Miller, AuD, Ian Windmill, PhD

Thank you for joining today's webinar, improving adult hearing care in the US through multidisciplinary collaboration, which is presented in partnership with the American Academy of Audiology. It's my pleasure to introduce our presenters today who are here from the Hearing Health collaborative and include Dr. Sarah Sydlowski, who is the current co chair, along with Dr. Matthew Carlson of the Hearing Health Collaborative, along with Dr. Erin Miller, who serves as the secretary, and Dr. Ian Windmill, who is serving as the treasurer.

You can find more information about each of our presenters. Their bios are listed under on the course page under your pending courses. And welcome everyone. And Dr. Windmill, I will turn the floor over to you. Thank you, Christy.

And welcome everyone to today's webinar. On behalf of Sarah, Erin and Matthew, we're very pleased to be here to share with you some very exciting developments and initiatives that we've been working on for the past several years. Before we get to the meat of the matter, we're going to just hear a brief message from the President of the Academy, Dr. Tish Gaffney. Welcome. I'm Tish Gaffney, the President of the American Academy of Audiology, and I'm here to share important information about the organization.

The Academy is dedicated to achieving recognition of audiologists as the experts in hearing and balance care and the field of audiology as an independent clinical specialty that is integral to the healthcare team. Through our partnership with Audiology Online, we're excited to offer courses like this one to help you broaden your knowledge and skills. We also offer the latest resources in practice management and evidence based clinical practice so you can grow professionally and improve patient care. We advocate for our members in Washington and across the country to ensure that the voices of audiologists are heard and we help connect audiologists to one another through our valuable networking opportunities like our annual convention. To learn more about the Academy, make sure to

visit audiology.org and now I'll turn it over to our moderator to introduce today's presenter.

Thank you.

Alrighty. So just to get a little bit of housekeeping, these are our disclosures and again you'll find them on the website Audiology Online as well. And then we also want to sure that there's the limitation risks of presentations like this are put out there for everyone to understand. And finally the learning outcomes from today, which is to kind of really address this hearing health, public health crisis that we've got in the US and the process that we've undertaken for the last several years to identify the problems that really exist and develop countermeasures to address those problems. And with that, we'll move into the presentation specifically.

And it starts off with this premise that there is a public health gap in hearing care in the United States. Now, this is not anything about your practices or your clinics that there's some difference between how you're presenting, how you're offering services, and what optimal hearing care is. And that's the gap is between what's going on now and what really we could idealize. And again, it's not anything to do with your practices. It's taking a step back and looking at the big picture.

And that big picture includes this, this important perspective that 3/4 of the hearing loss in the US is undiagnosed and untreated. And we have to start with that premise. There's so many people out there that don't visit any hearing type of practice, don't seek to get their hearing treated, don't even seek to get it diagnosed. Because of that, we see gaps in the number of people that actually use hearing aids or the number of people that are using cochlear implants. And that's what we mean by a public health crisis, that 75% of people with this condition are not seeking hearing care in the US So that creates a problem for us.

And that that problem isn't just the fact that they're not seeking it, but there's delays in seeking it as well. Those delays we all have appreciated have been on the order of seven to 10 years before somebody comes in. So it's not just untreated, it's not getting in to get treated either. And especially over the last, let's say, decade, we've come to appreciate that the impact of hearing loss goes beyond just simply communication difficulties, but it's quality of life and the comorbidities that have been become associated with hearing loss. So the problem is compounded, and these other issues are compounded by not getting people in to be treated.

So it begs the question, how do people come into hearing care in the US and so in a very simple way, we can say there's probably three primary routes that they get in. The first is the medical route. We'll call it conventional healthcare. In the US the medical route is somebody goes, sees their primary care doc and they either get screened or they bring up the fact that they don't hear. Or their spouse says, you know, you know, my husband can't hear.

And the primary care physician then refers them into the hearing care system. And in this case, the hearing care system is not just audiologists, but it's otolaryngologists and even the dispensing community. That's the hearing care system. We're not distinguishing between those at this point, we're just saying how do they get to those locations, those providers? So coming through the medical route is one way.

The second way is direct to hearing care that the patient comes in, calls the office of the audiologist or the otolaryngologist and says, I've got a problem, I would like to come in and get that problem addressed. We call that somewhat of a constrained route right now simply because all the rules and regulations, for example for the Medicare haven't allowed direct unfettered access by patients into the hearing care system. The third route is this new emerging route of the retail. It's self care where an individual will have a hearing test online or on the phone and based on that they will purchase products

or use devices. So over the counter devices would be the one we think about the most.

And the hope is that the people that go that route will eventually make their way either directly into hearing care or through primary care process as well into the hearing care system. So we really have these three routes and for us that are part of the hearing care community, this direct connection with the patients has been something we've worked on for at least 40 years that I've been in the field. So we try and get people to come directly to us to understand what we are, to understand the importance of hearing care. And so we put a lot of time, energy, effort and money into that system. And we'll call that the business and political approach.

So at a local level, some of you have probably looked at your demographics of your communities and what the pricing strategies of your, of your competition might be in that area. You've used advertising, perhaps direct mail or done lunch and learns or those types of local level approaches to try and get patients to your facility. At a national level, we see our professional organizations, as Tish Gaffney just said, advocating for U.S. medicare Advantage programs and national brands such as the Beltones of the world, who have advertising campaigns on a national level perhaps that are trying to direct individuals into our practices. And of course then we have our political avenues, the lobbying at the state and national level that leads to legislation, the federal Employees Health Benefit Program that added audiology a number of years ago, things like that, that again, try and allow this direct route into our hearing care community. And the question is, how well is it working?

How well have we done? And I think that you probably at the local level do reasonably well, depending on what, what type of business approach you take to it. But it doesn't solve the national problem of 75% of people who are not being diagnosed. So that's something that, that we had to look at and say, why isn't this happening? What can we do better?

What's going on out there?

Well, we can see, and this slide's a little difficult to understand, but on your left, the net unit hearing aid sales in the US over the last 18, 19 years have gone from about two and a half million units to almost five million units. So we've doubled. So that's a good sign that the number of people that are acquiring devices on any given year continues to go up. So we must be reaching more people. Correct.

However, the population in the US at the same time has grown. So there's a correlation. It's not a cause. But is it just because the pool of people is getting bigger that that's why we're selling more hearing aids? But proportionally we're still only getting that 25% into our offices.

So as we look a little deeper and say, okay, well, what do people out there really know about hearing and hearing loss? And this was a study done by Dr. Sydlowski and Dr. Carlson and others where they looked at what people understood in the adult population about hearing and hearing care, etc. And though many people could identify what a normal vision is, 20, 20, or blood pressure 120 over 80, less than 1 in 10 could, could tell you what normal hearing was, much less hearing loss. But they can't define it. That's very poorly defined out in the community.

And, and again, when you say, all right, so who's going to go out there and do something health wise in the next year, about a quarter of the people said they were going to get their hearing checked. Well, that's the exact 25% that we know do that. The other 75% don't. And that's, you know, if you look on this graph on the right, you can see that two thirds of the individuals are going to get their eyes checked, but only 25% are going to get their hearing checked. So we see, you know, a real difference in how people are viewing hearing and hearing loss in the country.

And that's, that's kind of goes right into this perception of what is hearing care. So a study that came out in 2021 looked at how people think about hearing care in a variety of kind of countries that English speaking countries in the world, and several key points. First of all, the participants overwhelmingly

thought that hearing care services, hearing health care, is the same as purchasing hearing aids. We have a bias that exists in our population that says, oh, this has got to be about selling hearing aids. And that's been the business approach that we've seen.

Some of our national advertising, et cetera, is talking about hearing aids, get your hearing aids, but it does talk about hearing health or hearing care. So people now equate hearing and hearing aids on a global scale, actually. But they also note that there's more promotion of hearing screening or hearing devices or even what hearing healthcare is by their primary care physicians. And they rely on them to get a recommendation of who to see and the information that they get. So that hearing health care provider.

I'm not the hearing. The primary care provider becomes a key person in the patient's perception and their journey. As we have taken the direct approach, come see us directly. They're equating that with hearing aids, but the hearing health is something that they're. They're kind of in the medical route about.

So as we go back to this chart and the amount of effort and time and energy with, I think, positive results over the last 20, 30, 40 years, it's still only yielding this 25% rate of people coming in. So the question is, is there a different route that we should be thinking about? And that's that medical route that allows people to come in through somebody that they trust, be referred to a place that they feel like they can trust, and to get their hearing care, not just hearing aids.

Well, that's got its issues too. The medical pathway definitely has issues, and there are gaps there that we can easily identify. If I polled you all right now, you'd come up with a two or three big, big things that we know that exist. First of all, what do primary care physicians know about hearing loss? Well, they know it's important, and being normal is important and being abnormal is not good.

But they're not really sure what normal is. They don't know that it's treatable. They certainly don't know that it's preventable. So amongst primary care, who are more knowledgeable in a lot of areas, even they have limitations about it. So there's this, this knowledge gap that exists.

And certainly when they, when they look at their patients, they've got a lot of things that they have to really deal with. Heart disease and cancer and diabetes, etc. Those are very important. Those are life issues. And hearing loss is a very low priority for them.

However, with the kind of linkage to some of those things, it may become higher priority. But there's nonetheless a knowledge gap in primary care. There's also a gap in what screening methods to use. The World Health Organization says, oh, it's important. But only 20% of people, primary care physicians screen for hearing loss.

Less than 5% refer. And of course, the options they have between the finger rub test and the whisper test and those types of things, there's not really a consistent way that anybody, you know, looks at how to screen for hearing loss. And it's certainly been compounded by the U.S. preventative Services Task Force in that they found there's insufficient evidence to be able to recommend that screening take place. And that's a challenge for all of us to, to take, take up that, that challenge and say, okay, let's prove that getting hearing screening, getting hearing healthcare is important. But the recommendations that they made, even though they made a recommendation to not say that this is important at this time, they did have some conclusions.

For example, they said that they agreed that hearing loss has a negative effect on people. Right? They also reported that primary care physicians acknowledge a lot of barriers. The knowledge which we've already talked about, the poor perception of hearing health care, the time that it takes to do the screenings, and of course, reimbursement is always a big issue. And the patient barriers you can see include the lack of awareness, the confusion about their options, who do they go see, how do we make

decisions, what are the preferences?

What about the cost factors? These are knowledge gaps that exist, but into the medical route. It doesn't help that we don't have any kind of solid recommendations from agencies such as this that pushes primary care to do more in terms of hearing screening, in spite of the fact that there are studies out there that show that, yeah, there's referrals increased by a factor of six in this particular study, and 80% of those people had hearing loss and the majority of them received hearing aids. So we know that that's a good route by studies, but it's an ineffective route right now because of some of these gaps, and it doesn't help in how we communicate with our primary care physicians. I pulled this right off an audiogram that was sent out.

Mild low frequency mixed hearing loss with precipitous drop, moderate to severe, et cetera. And everybody on this webinar understands that and could probably redraw the audiogram from that. But primary care physicians don't draw audiograms and don't do them enough to understand what this means. So if you're not part of the hearing health care community, it's very difficult to understand what we're really communicating about this individual. Not to mention the way I communicate it and the way somebody else communicates it is problematic.

They're different. And so they've got to try and figure out are these the same or different. And so even within our fields, there's some ambiguity. So this communication gap that exists in this medical pathway is also problematic for us. And we can see that in the referral rate.

So we know the population's going up, we know we're selling more hearing aids. But when, if you look at the referral rate, and this is in traditional Medicare, so this is the number of people that were that are enrolled, and this is 2022 data was 35 million people in traditional Medicaid, not Medicare Advantage, but traditional Medicare. And. But the number of audiograms that we did in that year that Medicare paid for was 1.2 million, 1.3 million. And that means 3.6% of those 36, 35 million people got audiograms.

The graph below is just included as a reference point, which again shows that the increase in Medicare and the blue, but the green, I mean, the green, the orange lines are the referral rate of audiograms. And you can see 3.5%. It just sticks at three and a half percent. So primary care is only referring for getting audiograms about three and a half percent of their patients, Medicare patients. And we have to assume that that's how it is for all their payers that they see.

So we're not. This gap is existing in that, that medical route. Those gaps in the medical route are continue to be barriers to get patients to come see us. Right. So we have to address these gaps.

How do we overcome some of these gaps? We've done the business and political approach. We should continue to do that. How do we work on these other gaps that exist to remove the barriers to allow people to get hearing care in our country? And this is where the group called the Hearing Health Collaborative was formed to help bridge that gap.

The Hearing Health Collaborative is really a multidisciplinary group that was put together, and it consists of people from audiology and otolaryngology. There's geriatricians, family practice, internal medicine, people from industry, people from our professional organizations, consumer groups, et cetera, who all came together to say, all right, we've got these gaps. How do we begin to understand the gaps and create solutions to them. And because of that, we took a very scientific approach to figuring out the root causes. Not just saying the gap is there, but why is the gap there?

And out of that became the goals of the Hearing Health Collaborative was to decrease the number of people that get diagnosed by 50%, double the number of people that have hearing aids, and double number of people using computer cochlear implants. And so those are audacious goals. But this group has taken it on in a very scientific, rigorous and multi year approach to try and figure out the cause and solutions to that cause. And with that, I'm going to turn it over to Dr. Sydlowski so that she can explain

what we went through over the last few years. Thanks so much, Dr. Windmill.

I'm really looking forward to sharing with you exactly how we've done that. I think what's really important to understand here is that just like there's a science to the care that we provide, there's also a science to how we drive improvement. And while we have had lots of energy, lots of passion, lots of enthusiasm for many of the challenges that Dr. Windmill just described, we have continued to approach that challenge in much the same way. We recognized that we needed to think about a different approach. And as he mentioned, we felt that approach needed to be very thoughtful, very scientific, very data oriented.

And that's what the Hearing Health Collaborative has undertaken. One of the key components to our rationale is to not jump directly from the problem to the solution, but rather to take the time to really understand the drivers of this ongoing, pretty perpetual challenge that we're facing.

There's a quote that I really love. It's usually attributed to Abraham Lincoln. That is, if I had nine hours to cut down a tree, I'd spend the first six hours sharpening the ax. And what we have really been doing for the last four years or so with the Hearing Health Collaborative is sharpening our ax. We have been spending time using a good scientific methodology to dig to the root causes of this problem that we face.

And we believe that by taking the time to understand the data, to ask questions in a different way than they've been asked before, we will come up with better countermeasures that will help us to affect the change that we want to see.

In general, the approach that we're using is called cycles of PDCA or plan, do, check, adjust. This is a well accepted approach in the continuous improvement community, which is where we spend a lot of time really understanding what are the most likely causes of the problem that we're facing and we slow

down in order to speed up. This is something that's hard, especially for the group that we brought together, which of course is very accomplished individuals who are used to diving in and making things happen. It felt uncomfortable at times to really slow down and not jump to those solutions, but to evaluate where are we today, why are we there? To bring in different perspectives, not just from within the hearing care community, but beyond that as well, involving the voices of patients, of our associations, of primary care, of geriatric medicine, to understand where we are and why we're there.

And we spent a lot of time on that work before we ever considered the countermeasures that we would potentially put into place. And so what I'm going to share with you today is that process that we walked through in order to get where we are now. So if we dig a little bit deeper into this planning phase of a PDCA cycle, it really is all about understanding the causes that could be contributing to our problem. And of course, I could ask anyone on this call and all of you would have opinions about why this is happening. You probably have even taken some actions to try to counteract it in the ways that you can in your local communities.

But what we know is that there are literally hundreds, maybe even thousands, of potential causes for the problem that we're seeing. But most of those are what we call the trivial many causes. And there is a principle called the Pareto principle that suggests that it's actually the critical few causes, maybe at most 20% of those causes, that cause 80% of the effect on the problem. The risk that we run by jumping in and applying lots of solutions is that those solutions may apply to the many trivial causes without impacting the critical few causes. And so the theory is, if you take the time to deeply understand those critical few causes, then you can identify two or three or four really impactful things that you can do that will impact 80% of the problem and get you much, much closer to your goal.

Conversely, if you're applying your countermeasures to the many trivial causes, you run the risk of being busy, of being overburdened, of feeling like there's lots of activity, but not actually seeing the

results that you want. And so in order to discover what are those critical few causes, we have to take the time to understand not just the causes, but the true risk, root cause of the problem. This is another quote that I think is pretty inspiring when we think about this work. And that's from Desmond Tutu, who said that there comes A point in time where we need to stop just pulling people out of the river. We need to go upstream and find out why they're falling in.

So I think that applies to our work because we need to stop just reacting to the patients who happen to make their way to us or addressing the challenges that are much further downstream. We need to go back to the root of the problem and find out why do we have this problem to begin with. And so the vast majority of the last four years has been spent doing that work. Once we have identified the root causes, then we have the opportunity to choose the countermeasures that will be the most impactful. And again, that may only be a small number so that we can really, really dedicate the most time, attention and resources to those efforts that will have the greatest impact.

And I think you'll see that come through and where the group has landed. In order to guide our thought process, we have been using what's called an A3 thinking approach. And it's called A3 not because it's an acronym for anything, it's traditionally done on an A3 sized sheet of paper, but it can be done on the back of a napkin. It's really not about the tools itself. It's more about the method, the approach, the thought process.

It is designed to help us systematically organize and analyze a problem and prevent us from jumping to solutions. It's divided into the left and right sides of the A3. On the left side, this is that planning phase that I've been talking about. This is where we first identify and quantify the, the problem that we're trying to solve. We next spend a lot of time thinking about what is happening.

Today. We look at data to understand not just what our perceptions are, but what actually is happening, how much it's happening, where it's happening. We then set a target to identify where we ultimately

want to be, which allows us to describe in great detail what the gap is between where we are today and where we're trying to go. And that becomes what we're trying to solve. For in the bottom left corner, this is maybe the most important box on the A3, and that's the analysis section.

This is where we start to describe all of the causes that are contributing to the problem that we've described and then narrow down to what the root cause of those problems might be. And all of that happens before we ever move to the right side of the A3, which is where we start identifying the countermeasures that will counteract those root causes, developing an action plan to put them into place, and then once we start to see movement on that problem, creating a plan to sustain the overall impact.

So using that A3 approach, the hearing Health Collaborative first defined our problem statement, which Dr. Windmill already introduced to you and is related to the large number of individuals who are untreated or undertreated for their hearing loss, as well as that delay in seeking treatment. And as he alluded to, our goal statement is really just the inverse of that, which is to have more individuals who are managing their hearing loss and their hearing health and decreasing the amount of time it takes for them to do that. This is a really ambitious goal, a very ambitious timeline, but it gives us direction for the impact that we want to see happen.

We then spent a lot of time in this analysis section and we've used a number of tools in order to help us break down the problem that we're trying to solve. Again, these are well recognized and very vetted approaches that are used within continuous improvement in order to analyze the problem at hand. So we use some tools, including fishbone diagramming. This is an approach that allows people to identify all of the many causes that can be contributing to the problem. It then creates a framework for prioritizing the causes that deserve the most attention and focus.

We then used a five why approach to dig down to the actual root causes of those prioritize causes. And finally, once we had zeroed in on the root causes, we identified potential countermeasures and used an approach called the countermeasure go no go to identify those that would have the greatest impact. Now, four years of work is a lot to summarize in the short amount of time that we have together today. So I'll just hit a couple of the highlights early on. This is one of our very first fishbone diagrams.

And it's so named because on the right hand side is what we call the head of the fish. And typically that's where your problem statement would be. And then each of the large bones of the fish here are kind of the categories within which each of the different causes fall. So for us, initially we felt that there were causes related to patient's motivation, a difficulty actually diagnosing the hearing loss to begin with. Identification of hearing loss patients not being able to recognize if their hearing is normal or not.

We also recognize there are some causes related to reimbursement and patients underutilizing the spectrum of treatments that we have available for hearing loss. As we dug into that more, we identified a few areas that we felt were the most impactful and where we should put some of our attention also within the scope of influence, where we actually have an opportunity to drive change.

We then took some of the prioritized causes which you see down the left hand side of this figure, and we considered some potential countermeasures which you see across the top. And a really important step here is we thought about for each of these different countermeasures that we were considering, how much did they impact each of these different causes? And we found that there was was a lot of overlap, which helped us to feel confident that if we put time, attention and resources in these areas, we were more likely to see the impact because it had a broad reach.

So looking at our problem statement again, which is the large number of individuals who are untreated or undertreated for their hearing loss, as well as that delay, we ultimately zeroed in on three primary countermeasures. And those countermeasures are first, to develop and embed a simple metric as a

vital sign for hearing health. Helping people know what is normal hearing and is my hearing normal or not. That's the first step to knowing that they need to take action is they have to recognize that there is a problem that they need to address. The second countermeasure is to develop and embed a simple and consistent reporting method for sensorineural hearing loss that defines appropriate treatment pathways as standard of care.

To say this more simply, we recognize that there is a need and an opportunity to have a staging system for hearing loss. The purpose of that staging system is to connect the degree of hearing loss and the impact that hearing loss could be having on an individual to the actions that need to be taken by that individual by their primary care provider. And it also aligns very closely to the types of staging systems that most physicians and other healthcare professionals are used to using. So it aligns to their vocabulary instead of aligning to our vocabulary, which, as Dr. Windmill pointed out, can be pretty convoluted and confusing for someone who is not a hearing health professional.

And then third, the third countermeasure is to secure evidence based procedural change for timely referral for clinical evaluation and treatment. In other words, what are the steps that need to happen to actually identify the degree of hearing loss that someone has and their candidacy for potential treatment? Now, the first three countermeasures are pretty straightforward. Develop a vital sign, develop a staging system. But within that third countermeasure, we still felt that we needed to go deeper in order to be very specific about the steps that would need to be taken.

And when doing a three thinking, there is an approach that's known as a baby A3. So where you have your parent A3, which is the initial problem, you can take that next level down and dig even deeper to the multiple problems that may exist within the one problem. So we took that next step. Within this third countermeasure, we recognized that there were actually multiple problems that needed to be addressed when we're talking about recognizing hearing loss. So we had three separate problem

statements within that third area of referring for clinical evaluation and treatment.

The first problem statement is related to the fact that a small number of primary care physicians routinely screen or refer for hearing loss. The second is related to the low hearing aid adoption. And the last is related to low cochlear implant utilization. We then went through a very similar process that I've already described to understand our current state, to set targets that we wanted to achieve, and then to go through that analysis of understanding what was contributing to the problem. Again, we went through several steps.

Many were similar to what I just described. One that was a little different is that we actually mapped the process. So this is a process map that describes the experience of the patient when they enter the process and where different points of occurrence happen for different prioritized problems. So that help us understand where within this process we had opportunity to improve.

Again, we used fishbone diagramming to recognize all of the potential causes. I think this was one of our most complex fishbone diagrams we had. We identified over 150 potential causes. And the dots that you see here are where we prioritize those that the group felt were the most impactful. Taking that information, we then used a tool called an effort impact matrix in order to plot where different activities would fall in terms of how much effort would go into them and how much impact they would have.

And that's a very high level description of a very detailed process. But ultimately that helped us to identify several sub countermeasures within that third countermeasure. The first is around defining a screening standard and training primary care providers in how to use that screening standard appropriately. The second is around training primary care providers regarding hearing aid use and when that's appropriate. And then the last is around cochlear implant utilization and includes some components related to increasing the visibility of outcomes that we see on a regular basis from CI use, standardizing the expectations in terms of the results, and really shaping that referral path.

To simplify getting from potentially being a hearing aid user to recognizing the opportunity to use a cochlear implant.

So after four years of very detailed work, we have come to the conclusion of this planning stage. And we are now at that juncture between planning, really defining and studying our problem, and moving to implementing solutions. What I think is the strongest aspect of this work is that we are not using the same approach that created the problems that we are trying to solve. This is a very novel and innovative approach. It's thoughtful and data driven and gives all of us a lot of enthusiasm and confidence that we are heading in a stronger direction than we've been able to so far.

I'll now turn it over to Dr. Miller, who will get into more detail about the solutions that we plan to implement and a little bit more on the rationale behind them.

Thanks, Dr. Szydlowski. So I'm going to spend a little bit of time now talking about those countermeasures that Dr. Sydlowski had presented. But when we look at it, sort of the overarching goal, we spent a lot of time talking about the need to medicalize hearing. Certainly when we look at age related hearing loss in particular, it has been viewed as a sensory and not a medical condition, even though hearing loss is the third, third most common chronic physical condition in the US which is twice as prevalent as diabetes or cancer. And so the collaborative really feels that we need to tell the story about hearing loss better than we have.

So how will hearing loss impact the individual? We need to let those frontline providers, the primary care physicians, geriatricians, have a better appreciation of some of the potential risks associated with hearing loss decline. Even we've seen evidence showing that patients may require more medical treatment if audiologic treatment is not received. We want to look at mental health issues. Certainly there are, you know, much data that support social isolation leading to depression and depression

needing medical intervention.

And also for those with a greater risk of dementia, there's more evidence showing that that risk increase if hearing loss is untreated. And then finally, looking at some of the safety issues associated with untreated hearing loss. Certainly there's been some connection with potential fall risks, but we know that there could be information that is occurring during those primary care visits where there's a misinterpretation of oral communication between the provider and the patient that leads to increased hospitalization or other care needed to be provided. So if we look again at those three countermeasures that Dr. Siedlowski had presented, our goals are to create a simple metric, again, a staging system, and then to provide the procedures that would get individuals into the continuum of care, whether that be evaluation and then on to hearing aids or if that's evaluation, and onto cochlear implants. So we're going to take a little bit greater look at each one of these and where we stand today and why we think these rose to the top of the three countermeasures that will have the greatest impact.

So, number one, that simple metric or vital sign for hearing health. If we think about many other medical conditions, there is a simple metric or a vital sign that really helps both the public and other frontline providers understand when action is needed. So if we think about something like vision, we know 2020 vision is normal, or blood pressure. We're all very familiar with ideal blood pressures being at 120 to 180. But what, at what point is action required?

And so these are signs, not only do our healthcare providers understand, but the general public understands as well. So when you think about creating a health metric, there are some things that we need to ensure in order for it to be universally used. So we have to have something that's understood, that's acceptable, accessible, that's actionable and clinically meaningful. So, you know, there are other metrics that we've discussed that will show that these are really things that the general public understands. For example, with blood pressure, if we know that 120 over 80 is normal, then we know if

our blood pressure goes above that, when is action required.

And we need to help the healthcare providers know when that action is necessary for hearing health as well. Certainly we know with blood pressure, once it gets to that 140 over 90, some changes need to occur, whether that's in how we're handling ourselves or whether that's in medication. So we need to help these frontline providers understand the metrics that we're creating for hearing as well.

So if we look at just our current state, where we're at today, the descriptions that we're utilizing to provide information both to providers, other providers, as well as the patients themselves, clearly doesn't align well with their perception of hearing difficulties. I think we could all agree. We've had many patients who might audiometrically exhibit a mild hearing loss, but their perception of hearing difficulties is pretty significant in the places where they're having challenges to hear well. So when we look at the audiogram as a whole, it's sometimes very challenging for individuals to interpret the audiogram, whether that be the patient themselves and spending a lot of time trying to help them understand that. Is that a good use of our time or does that really help them as well as the other healthcare providers?

So some of these current descriptors certainly don't stimulate any kind of decisive action by the patient or the provider. So we know that we need something that the public can more easily understand. I've had patients often ask me, well, can you provide me with a percentage of my hearing loss? And I've looked to other pieces of data that might provide that to them. But I think we know if we could give them a simple number or something similar to what we have with vision or blood pressure or blood glucose levels, that would make it much easier for our patients.

So there has been a movement towards a hearing vital sign. Certainly the Hearing Health Collaborative is not the first group that considered the need for something that was more easily understood by the public public. This hearing number is an app that's available to the public, that's been promoted by the Johns Hopkins Bloomberg School of Public Health. And they've done created this app in concert with

Mimi Hearing Technologies. Essentially this is a four frequency pure tone average.

You can enter data into it or take the test online.

I'm sure that the Hearing Health Collaborative is working towards what we will use as a vital sign. We haven't landed on that specific vital sign as of yet, and we're certainly using the current evidence, including what Johns Hopkins has come up with, to guide our decision making on creating that vital sign.

The second countermeasure is a simple and consistent reporting for hearing loss diagnosis.

Sorry about that. So we know that with staging hearing loss, we need to create a common reference point for the condition so that our primary care providers and those frontline providers will be able to reframe hearing loss as really a chronic health condition. And we can embed it in ways that they can use this information. So we want to have standard recommendations for those primary care providers. If we look at this and consider the parallel between the ease of our frontline providers implementing some type of a staging system, moving over to what creates diagnostic certainty, we thought it would be good to compare this between oral cancer and hearing loss.

The top three images here are an example of entry into medical care and the workup that would be required for oral tongue cancer. Initially, a PCP or an ENT would feel the tongue and the neck for a mass or palpate the lymph nodes. And based on that initial diagnostic exam, they would recognize that there was some additional diagnostic evaluation necessary for them to be or have greater certainty in their diagnosis. And so they would order imaging, typically CT or mri MRI or PET scans, and that would help them improve that diagnostic certainty. But then once the disease is proven, then they move on to final pathology, which gives them an in depth look at the diagnostic information and would allow them to grade that particular tongue cancer.

If we parallel that to hearing, perhaps that simple iPhone screen that we talked about with the vital sign could assign an initial diagnosis as somebody having hearing loss that requires requires then additional testing that could move them on to a basic audiogram. And then patients may need to be moved on to much more in depth diagnostics if maybe they're at the point of requiring other kinds of technologies or cochlear implants. So if we can create a simple, scalable sort of initial screen that then moves into the different types of diagnostic testing that would allow us to have those frontline providers involved in this process and allow them to direct individuals into the care of the audiologist. And so if we look at staging scales, there are a number of them relative to other health conditions like breast cancer or congestive heart failure or dementia. Many of these are embedd into the primary care physician's electronic health records.

And that allows them to begin that process where they can guide the patient into ensuring that they receive precise and targeted and appropriate management, whether that be onto further diagnostic testing, onto management in another area.

So if we look at some of what is being utilized today that our primary care or frontline providers have, it's some of the current descriptors that we've talked about, from normal hearing to, you know, severe profound hearing loss, all of these have been aligned to that high frequency pure tone average. And it does provide them with some of the perceptions that that patient with that degree of hearing loss might have in quiet or noisy environments. But it really doesn't provide that frontline provider with any of the next steps on what they should be doing with this particular patient. So I think a staging system would allow the PCPs to have an easy and simple way to support referrals throughout this process so that that individual gets the required diagnostic tests needed and the management. But we need to make sure that any staging system that we're creating does align with that initial vital sign, which is our countermeasure one.

So I think this staging system in and of itself will support the view of hearing loss as a chronic disease that can be managed appropriately and will align with other chronic diseases that physicians certainly understand and are able then to move patients forward in the process of care.

So our next steps for countermeasure one and two, certainly we're in process of acquiring support or financial support. In order for us to move these endeavors forward, we want to engage with an outcomes research team so that we can complete a comprehensive systematic review of the evidence that currently exists, identify some of the gaps in the evidence so that we can actually begin creating that vital sign and the state staging system. We do have manuscripts ready for publications on both countermeasures one and two. And then finally our countermeasure number three, the evidence based procedures to support referrals to the continuum of care. As Dr. Sydlowski mentioned, this was a bit more complex than we had originally thought.

And when we look at some of the these countermeasures, particularly this one in particular, you know, there's a lot of change that is going to be required and change is challenging. We need to be increasing the visibility of the outcomes without really allowing our emotions to sort of overtake us. So we really started looking at the metaphor that Dr. Mohammed Gamal really discusses about behavior change and how do we get to engaging the writer or really using that systematic approach that both Dr. Windmill and Dr. Szydlowski discuss, where we're looking at that rational side of our brain and planning and analyzing and creating appropriate expectations so that we can really shape and simplify this referral pathway. Because that's what our Countermeasure 3 is all about about. So we are looking at this point, as Dr. Sydlowski said, we created some baby A3s, but our next steps are in creating and endorsing a screening standard, recognizing that once we do that, we're going to need to train the PCPs or those frontline providers to identify hearing loss and then refer those individuals on for treatment and so that we can optimize the change management both for cochlear implants and increase the likelihood of patients seeking treatment for their hearing loss.

And so finally, if we look at the Hearing Health Collaborative as a whole, I think what's so wonderful about it is there are really no political motivations from the collaborative. Anyone who has a vested interest in better serving those with hearing loss is welcome to become involved. We are engaging other disciplines and other stakeholders. It's been eye opening to see some of our physician colleagues and their ideas of, you know, what they think would be helpful in moving this initiative forward. Certainly we're going to look to multiple societies and other agencies to endorse each step of this as we finalize the vital sign and staging system.

We do have great confidence in the scientific investment that we've made in identifying the root causes and then these initial countermeasures. And again, I'll say these are the three initial countermeasures that we thought would have the greatest impact. There certainly are other things that we will need to look at down the road. And so with that, I am going to open this up for questions and let me see if we have any questions that have come through. Sarah, why don't you tell the audience how they could get involved or how they can engage with the Hearing Health Collaborative if they're interested in participating?

Absolutely. Thank you. If anyone is interested in participating, you can go to our website, adulthearing.com and there is an interest form that you can fill out there to indicate if you would like to contribute your time and talent. There's an option for that. If you just want to have a more direct connection to follow our work, that is a possibility as well.

So please do consider checking that out. This team only works because we have many enthusiastic, invested members with lots of different backgrounds and perspectives. As we have continued to grow, I think the work has just gotten stronger because we are engaging more and more people who can bring different perspectives and different talents forward. So please consider participating.

Great. Thank you so much, all of you. If you could please advance to the final slide.

I'd like to thank our presenters from the Hearing Health Collaborative for sharing their time and expertise with us. And I'd also like to thank everyone who participated in today's course. We look forward to getting your feedback on the course evaluations and hope that we will see you in future courses on audiology online. This concludes today's course. Have a great rest of your day.