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Telecoils, Hearing Loops and Auracast: A Hybrid Solution to Client Satisfaction

Presenters: Karen MacLennan, AuD, Juliette Sterkens, AuD

It is my pleasure to welcome back to Audiology Online our guest speakers, Dr. MacLennan and also Dr. Sterkin. This course is an update on telecoils. If you'd like to learn more about our guest speaker, you can read about their bio on the course registration page.

And at this time, I'll hand the mic over to you. Hi, everybody. We're really excited to be back. I'm going to advance the slides at this time. Here you can read about our disclosures, and here you can read about the learning outcomes for this course.

And this is us. So our session outline today includes notable achievements in hearing access. We'll discuss hearing devices and assistive listening systems, and we'll talk about T coils, auracast, and we'll close with resources. So it's very exciting to be back at Audiology Online presenting. The last time we presented was in 2018, and since then we've seen tremendous, a tremendous increase in hearing access across the United States and in other countries.

Here is a list of airports, and I won't list the airports by name, but you should be aware that hearing loops were installed in these airports, domestic airports, and internationally. And the locations in these airports can include throughout the concourses, at gates, at baggage claim areas, and at welcome desks. So that's really exciting to see. And the Statue of Liberty has a new museum. About a little over five years ago, a museum was built behind the statue.

And there are numerous exhibits at the statue, some of which include audio that's integral to the exhibit. And wherever the audio is present, hearing loops were installed at those exhibits. And New York City taxi cabs. So taxicabs, the decision to have them looped was decided well over 10 years ago. But I included a slide here today because we're seeing a greater number of taxicabs on city streets that have hearing loop systems installed.

And Lincoln Center. Lincoln center underwent a major renovation a few years ago. And this is a notable achievement because hearing loops were installed in multiple theaters in Lincoln center as well as other areas. And another notable achievement, which is very exciting, Lincoln center was also the home of a recent demonstration of auracast. And that is a notable achievement because although it's not a permanent installation of the technology, it's an achievement in the development of AuraCast as assistive listening.

So that was exciting to see. If you're traveling in Massachusetts, you can enjoy hearing loop or hearing access through hearing loop systems on the Green Line trains. And if you're traveling in Madrid, Spain, and find yourself in a taxi, it just might be one of 3,000 taxi cabs that were looped in Madrid. And this is an image of an escalator. And I included this because it shows how creative we can be with hearing loop installations.

So this escalator was at an expo on accessibility and it's a 21 second elevator ride. Every seven seconds you have a different auditory experience. And to make this elevator ride hearing accessible, three hearing loops were installed here. So a very creative way to loop, you know, an interesting piece of equipment to say the least. Amtrak has made significant increases or a significant commitment to increase access.

And in their new fleet of 83 trains, you will find hearing loops installed and performing arts centers across the United States. So not too long ago, I was working off an old version of this map and I was just provided with a new version. And I'm so excited that it was so timely for this presentation. I think one of the things that gets my attention immediately is the state of Florida for two reasons. They have over 50 performing arts centers that have hearing loops installed.

I think that's a considerable number. In addition to that, the old map that I was working off of that indicated where hearing loops were in, in installed impact centers or PACs. Florida came in in the 25

plus category. So we're seeing hearing loops being installed continually across the United States. And I have to thank the center for Hearing Access who provided this most recent update.

And I will be working with the center of Hearing, the center for Hearing Access, because I just learned last week of a hearing loop that went into a pack. In Gainesville, Georgia, the Pam Ware Performing Arts center had a hearing loop installed about a month and a half ago. So that's really exciting. And hearing loops hearing loop was installed at Starkey headquarters at their training facility. So up until this point, the hearing loops that I've mentioned were either having to do with travel and transit or were some notable installations in well known facilities.

But there are other hearing loops that are being installed across the United States in lesser known facilities. Certainly not lesser, but lesser known. For example, in Denton, Texas, a worship facility had a hearing loop installed. And that hearing loop accommodates their 3,500 occupant seating capacity. So that's exciting to hear.

In addition, in Albuquerque, New Mexico, a community of affordable housing was built. And this affordable housing was built for people with hearing loss, people who are deaf, and people who are deaf, blind. And the 23 units in this affordable housing community all have hearing loops installed. In addition to that, they have hearing loops installed in their computer lab and in multiple meeting rooms. So that's exciting to see.

And my second to last notable achievement has to do with the center for Hearing Access. I think a lot of us are familiar with the website hearingloop.org so the website address is the same hearingloop.org but the website name has changed. It's now the center for Hearing Access and thanks to an advocate named Win Wyman. She has done an incredible job of updating this helpful website. And we're thankful for the work that Win does because it's rather significant.

But we also are very thankful for other advocates for hearing access and for the work that they do as well. So the center for Hearing Access when you visit this webpage, I'd like you to I'd like to draw your eye to the black menu bar in the middle of the screen and there you will see the word places. And when you select places, you'll be brought to an area where you can choose a state of your interest and where hearing loops are located. You can find that listing by city through this website. And if you really want to get excited about hearing loops, check out Florida's page, because Florida's page for hearing loop access is over eight pages long.

@ the end of each state's page you will also find some educational information that's very helpful for practitioners, professionals and people with hearing loss. The center for Hearing Access also includes information about other systems. This was part of the major update and when you click on other systems, you're brought to an overview page where you can compare the different types of assistive listening and you can get specific information about different types of assistive listening. And my last notable achievement has to do with Google Maps. I'm so excited about this.

Google worked very closely with advocates for hearing Access to make hearing accessible facilities better known. So if you want to know about a facility and whether or not they are accessible to people with hearing loss, what you do is simply identify the facility that you want to do a search on. Here I selected the Jacob Burns Film Center. Midway down the page you come to an overview tab. And when you side swiped overview, eventually you'll come to the about tab.

And when you select about, you can find information about hearing access on Google Maps. So these are some incredibly notable achievements, not only specific to locations, but also about getting the information about where hearing access is available. With that I think I'm going to transition over to Juliet. Enjoy Juliet. Of course it helps if I turn on my microphone.

I am located in Wisconsin and I'd love to give a quick update on Wisconsin. Since our last event, we've increased a significant number of hearing loops. These are slides that I used in a recent TED talk. We are now well over 900 hearing loops and a couple of loops are being added on a weekly basis. And these are loops that I didn't know about.

They are happening outside of my eyesight, so to speak.

I don't know why. There we go. My TED talk was published in March and it has now been viewed nearly 700,000 times. And what that's doing is raising the awareness for hearing loops in technology as well as other hearing aid workarounds. The title is what you don't know about hearing aids.

That wasn't my first title, but that's the title that got settled on. I to publish a list for the Wisconsin audiologists of where hearing loops are found. And I'm slowly inching to seven pages. Something that I'm excited about and so kind of my first diving into limitations of hearing aids. And I talk a lot about that.

I talk about this with consumers and with professionals. And I believe firmly that as professionals we need to explain the hearing aid limitations to our clients. We need to explain that hearing aids are assistive, that they are not corrective, unlike eyeglasses, and that they can leave a significant hearing deficit even when insertion gain targets are optimized using real ear measurements. And I refer you to an article by John Greer Clark and Chris English. Consumers also need to be told that hearing aid microphones have limitations.

And a study by Matt Bakke has showed that the effective range of microphones is somewhere on the order of 50 inches or 1 1/2 meters. Of course, that distance is significantly reduced when there's background noise or when there's reverberation. And of course is bigger when the hearing loss is milder or when it's a quiet environment. And in addition, many patients experience SNR losses, signal to noise ratio losses that no hearing aid can be expected to overcome. So the graph on the left shows

the change in SNR loss due to aging.

And I draw your attention to the fact that the 20 and 30 year olds can be in background of noise that's louder than the speech signal they're trying to hear and still hear 50%. But that for those in the 70 and over 70, in the 60 to 70 and over 70 age groups that snr, and this is for people without hearing loss, increases from three and a half to over seven decibels. And we've all seen SNR losses, the SNR loss is even worsened. Of course, with hearing loss. And I used to do the quicksand test and I remember of course, testing patients who could barely get past the second or the third sentence and then ending up with an SNR hearing loss value of 10/12, 14 decibels, which means that the signal needs to be 10 or 12 or 14 decibels louder than the background noise in order to understand 50%.

But 50% isn't PB max in order to reach PB max or their maximum ability for speech discrimination, you can easily say that the SNR value needs to be doubled just to make it easy to listen. For effortless listening, if you will. Yet directional microphones may deliver improvements in snr, but that improvement is really a limited number. It could be on the average of 3 to 5 dB, might be a little bit more if the microphones are perfectly horizontally located on the ear, if the ear is completely occluded, if the signal is in the front and if the background noise is behind them. So for me it's a no brainer that the counseling of the patient should happen at this time, at the time of the hearing aid consultation.

And it could be as simple as explaining to somebody who doesn't score well on a quicksin, or a person for whom you're going to be ordering an occluding ear mold, that hearing aids have limitations, but that there are some terrific workarounds and that you as a professional are going to make sure that those workarounds are included in the hearing aid. And here, of course, I'm thinking TV streamer or remote microphones, but for public situations, that you will include a telecoil in a hearing aid and you're going to hear that plea more often in the next 45 minutes. And the good news is that you can tell your patients that that feature, that wireless antenna essentially comes at no charge in the behind the ear hearing

aid. Frankly, I used to ask my patients showing different hearing aid models, where do you not want to hear? And then let them answer me where they didn't want to hear.

So simply put, for clients with poor word discrimination, for those with moderate hearing loss, for those clients who walk out of your office with an occluding ear, molds hearing aids alone are frequently not enough. But these shortcomings can be overcome when coupled with assistive technology for private use. But to hear in public, better users need to avail themselves of assistive listening systems, those that are mandated under the ADA, the Americans with Disabilities Act. Currently the most efficient and the most accessible and the consumer preferred way is to do that or is to connect those assistive listening systems by way of the telecoil. So audiologist Justin Burwinkel, who, if you're interested in this study, did another class on audiology online.

He sought to document the benefits of telecoils in a variety of looped situations. And he made very innovative. He made recordings out versus in the loop with hearing aids that were modified, worn on the ear that could make snippets of recordings. And he then used Google Speech to Text to determine the word recognition score. And of course, Google Text or speech to text recognition also has trouble.

When there is a lot of background noise, those numbers go down. So in this chart, on the left are the recordings through the hearing aid microphone, out of the loop, if you will. And on the right are the recordings made in the hearing loop via the telecoil simultaneous recordings. And I draw your attention to this condition. This is a quiet city hall where podium microphones are used, an Auditorium, and 57% speech discrimination was obtained.

But in the telecoil mode in the hearing loop, that speech discrimination increased to 91%, which, by the way, is an SNR improvement of 10 dB. And that, for example, in the airport baggage claim that Karen mentioned a little bit earlier, essentially word discrimination is next to nothing at 2.6%, but it increased almost to 90% in the hearing loop. And that, by the way, is an SNR improvement between 20 to 30

decibels. And that kind of improvement, of course, will delight even the most experienced hearing aid user, even those users with severe to profound hearing loss and frequently will lead to unsolicited testimonials such as those in my next slide. And, you know, take your time to read these slides.

I personally think that testimonials like this speak for themselves. Frankly, every time I read them, they remind me again why I became an audiologist. And I believe that sharing testimonials or playing a video that you can easily find on YouTube, videos where recordings were made out versus in the hearing loop are very helpful when you're counseling patients before ordering hearing aids. And that brings me to the Americans with Disabilities Act. And it's really a law that I firmly believe we should be educating our patients about.

You know, we have a right. They have a right to a reasonable accommodation because their hearing loss, in effect, is a disability that falls under the ADA. And the law reads as follows. An assistive listening system shall be provided in each assembly area where audible communication is integral to the use of the space. And I didn't include that in this quote where a PA system is used.

So in effect, when a PA system is in use, the ADA mandates that an assistive listening system is provided. And the definition here of an assistive listening system is to bypass the acoustical space between a sound source, between a microphone on a stage or on a lectern and the listening by either means of a hearing loop, radio frequency or FM technology, infrared or direct wired equipment. And frankly, I've never seen, I've never seen direct wired equipment. And by the way, other than in courtrooms where assistive technology shall always be provided, assistive listening systems shall not be required where a PA system is not in use. However, in some states, the building codes are broader than the ADA law, meaning that, for example, states like Texas and California require that even non profit facilities provide assistive listening.

And what's not included in this slide is that the second part of the ADA applies to auxiliary aids. So even if there is no PA system installed, a patient, your patient can still request an assistive listening system. You know, I'm thinking about a counter hearing loop or an accommodation in a yoga studio where it might be difficult to hear or in osier lifelong learning classrooms. Next, Karen is going to be up discussing the telecoil, telecoil verification and telecoil validation. And then I'm going to return to discuss how we can link current hearing devices to the current hearing assistive listening systems in more detail.

Okay, so the telecoil, the T coil, also known as the telecoil, it's a fabulous transducer for many reasons. It is useful to people who wear cochlear implants, and it's certainly useful for individuals with hearing instruments. It's the T coil in the hearing instrument or hearing device that functions as the wireless receiver. So if a person is in a looped environment, they access their manually programmed T coil. And once the T coil program is engaged, they have direct wireless connectivity to audio through the hearing loop system.

So that's just one example of how T coils are used with assistive listening. T coils are also needed, though, to hear at prescription for other types of assistive listening devices such as infrared, FM or radio frequency. And we're going to talk a little bit more about that in a few slides, but just keep that in mind. T coils are also needed for other technologies, not just hearing loop systems. T coil orientation.

That's incredibly important. My default choice is always a vertically oriented T coil. A vertically oriented T coil will work well in a hearing loop system and a vertically oriented T coil will work well with a neck loop and the T coil when it's in your hearing instrument, it is incredibly efficient. It's efficient in that there's no battery drain when the T coil program is used and there are no issues with latency, also known as audio delay, when somebody can use the T coil in their hearing instrument. So that's pretty impressive.

And programming your T coils. So there's a little bit to consider here when we program T coils.

Certainly one of the first choices in fitting software may be for the Auto vs. Manual T coil programs.

Auto T coil is a T coil program that's for phone use only.

The auto T coil is engaged or activated when a telephone handset is brought to the ear. The magnetic field that emanates from the telephone handset triggers the auto T coil and that's how the auto T coil is used with a telephone. But it doesn't work with assistive listening. For assistive listening, we need an assistive. We need a manual T coil program, and that T coil program can be programmed in additional ways.

So for instance, you may choose between an MT program and a T only program. MT simply means that the MIC and T coil are active at the same time. T only means a person in a looped environment is only hearing through the T coil program. There are no hard rules for when these programs should be provided to patients or clients. MT can be used well with closed fittings.

T only programs typically work well for open fittings if the residual hearing allows a person to hear sounds in the environment. But to be honest, I'm a big proponent of giving choices and asking a client or a patient to use an MT entity program in a variety of listening environments. Because I can say from experience, for the work that I do with assistive listening, I use an MT program and I use a T only program to subjectively assess the quality of sound through assistive listening. So options are always helpful and there's nothing wrong with giving both programs. Manual T coil programs can also be programmed in terms of how they're going to be used.

So for instance, some fitting software may ask if this manual T coil program is going to be used for the phone or if the manual T coil program is going to be used for assistive listening. I always select assistive listening. The frequency response for the T coil program for assistive listening is broader than it is for the phone. Pro for the for phone use and verification should always be performed and we'll talk

about that shortly. In this image we see the gain and frequency response of a microphone and a T coil.

And for a person to use assistive listening, well, we need to ensure that the T coil gain and frequency response matches the gain and frequency response of the microphone. And verification. So verification is always fun. Splits is a verification test for the T coil that we're probably more familiar with because it's typically usually documented on the specification sheets. But SPLITS stands for coupler SPL in an inductive telephone simulator.

And this test is simply the results are telling us how this T coil is going to perform when a telephone is coupled to the hearing instrument. So when a consumer brings a telephone to their ear and their hearing aid. But the test that we want to perform to know how the T coil is functioning in a hearing loop is the SPLIV test. SPLIV is coupler SPL in a vertically in a vertical magnetic field. And this test will tell us what we need to know for assistive listening.

A couple of things you should be aware of for the SPLIV test and actually for the splits test, too. This is relevant. This test. Splits and spliv, they can be performed with the test box open because the signal is a magnetic input that we're measuring. So the test box can be open for splits and spliv.

When it comes to the spliv test, it's really important to have the hearing instrument in the as worn position. So either as worn handheld or as worn in a cradle, that will give us the information that will tell us how this T coil will function for assistive listening and for more information on verification. Because if you're really excited about verifying T coil function, we recommend checking out Dave Smriger's 2023 AO course on the whys and hows of modern T coil testing and verification. It is incredibly informative and well worth the watch and the learning. So thanks, Dave Smreka, for offering that course.

It really is fabulous. And accessory T coils. So these are available and they can be helpful in speaking with people that have hearing loss and talking with them about hearing access. These accessory T coil

options are helpful, but it's more helpful to have a T coil in a hearing aid because a person can leave their home and not bring the accessory T coil option, find themselves in a difficult listening situation. Find themselves in a situation that's not only difficult, but hearing access is available, and they're unable to use it because the accessory T coil was left at home.

So my preference is to include T coils in the hearing instruments and A word about neck loops. So neck loops are important for other types of assistive listening. The other types of assistive listening are body worn receivers require body worn receivers with neck loops. So those assistive listening devices are FM or rf, radio frequency or frequency modulated infrared or IR systems. And for facilities that use these types of assistive listening, a person is required to pick up a body worn receiver and a person with hearing loss and with hearing devices with cochlear with T coils they need the body worn receiver with a necklace loop.

So it's the body worn receiver that picks up the assistive listening system's transmitted signal. It's the body worn receiver coupled to the neck loop that transmits up to the T coil in the hearing aid. And this is what permits somebody to hear at prescription. This is also known as hearing aid compatible assistive listening. So we do need neck loops and we do need T coils because how assistive listening works with T coils varies per system.

The one thing I will say though about neck loops, if you have a client with a pacemaker, asking whether or not somebody has a pacemaker is important to me and should be important to anybody that suggesting clients or patients use assistive listening because there can be contraindications to using a neck loop with a pacemaker due to the proximity of the pacemaker to where the neck loop rests when worn. So I advise consultation with the with a physician regarding neck loop use. And there are other options other than neck loops. And my email address will be provided at the end of the presentation so we can talk about that further if you have questions. And lastly, validation.

Validation is important. It's important for consumers, our patients, our clients to see how their T coil is working. And you can always perform validation or encourage validation through a waiting room hearing loop in your office, a counter hearing loop system at your office. You can refer to your local Hearing Loss association of America chapter because more often than not those meetings take place in a looped environment. And last but not least, you can also find information about where hearing loops can be located through the center for Hearing Access.

But you can also use Google Maps. And before I hand it over to Juliet, I just want to make one more comment on verification. When we are verifying our T coils, the best time to perform verification is after the hearing instrument settings have been confirmed through real ear measurement. That's just the easiest time in the process of making sure the hearing aid is working well for the person you're fitting. All right, thanks everybody.

I'm going to Pass it over to Juliet. All right. And I will add that the center for Hearing Access has a handout that is specific to the verifit verification of telecoils. And essentially you would do the telecoil test after the whole hearing aid has been programmed. This is not an ANSI test.

This is a quick verification. And the handout comes with lots of photos of how to do this and takes perhaps a minute or two to do so. The fact that we belabored neck loops is because neck loops are also mandated under the ada. The ADA mandates that assistive listening systems must be usable for people with hearing aids, whether they have telecoils or no telecoils. And for people without hearing instruments, a quarter of all devices must come equipped either with a neck loop or in the case of a hearing loop, the hearing loop is the direct hearing aid compatible assistive listening.

And that means that if you get called in for information about a theater, they want to update their assistive listening. You'll be able to tell them that by law, they must provide neck loops. And these neck loops should not be ordered nilly Willy. It needs to be made sure that these neck loops are capable of

providing a strong enough magnetic signal that the telecoil can pick up. And for those of you who are dealing with assistive listening, it's not just people who are hard of hearing who use these systems.

Individuals with other disabilities, people with low vision, or people who are blind, autism, people with ADHD are also using assistive listening technology. And so that brings us to how telecoils are used. And, you know, we're kind of jumping back and forth a little bit about the different systems. But the beauty of having a telecoil in a hearing loop is that it allows the consumer to walk in, sit down in that room with all these people nicely lined up. The hearing loop is installed in the floor, underneath the carpeting, or perhaps even in the basement against the ceiling.

And any sound that is directed into the lectern's microphone gets transmitted to the loop amplifier, which pushes a current through these wires that create a magnetic field that the telecoil can pick up. So it's super elegant, super easy. No one has to divulge or let the world know that they're hard of hearing or wear a stigmatizing device. They can sit down, turn on the telecoil, and the telecoil is programmed for their hearing loss. And if you're programming telecoils again, there's more information about when to use m t setting vs t coil setting only.

There's even some apps currently that come with the hearing aids that allow the user to dial in, in effect the ambient sound so that they can hear their own voice when they're singing in church, or that they can hear the person sitting immediately to the left and right. But if they have poor discrimination, they are probably going to want to listen to T coil only. Hearing loop access is seamless. It's easy if the user has a telecoil in their hearing device, because without one, they are going to have to get up and locate a hearing loop receiver. And loop installations under the ADA also require that the venue provide loop receivers.

And I draw your attention to the signage. The signage is the ear with the slash through it. If the signage has the letter T, you can be nearly certain that a hearing loop is provided. So a hearing aid user only

needs to walk in if there's no T provided. That means they have to go and locate an assistive listening device.

And by the way, more and more loops are being installed at ticket counters. And in the UK, over 10,000 post offices have been equipped with hearing loops, where the vendor sits behind glass, speaks into the microphone, and the sound is wired directly or transmitted directly into the telecoils of the user. Now, if hearing aid users have telecoils, they can benefit from FM and infrared systems that Karen already explained. And in its simplest form, again, the neck loop is creating a magnetic field that the telecoil and the hearing aid can pick up. And you know, I hear too often that professionals justify not fitting or not recommending telecoils because there are no hearing loops in my community.

And I know I've been very vocal about hearing loop technology. But in the US there are thousands of FM systems installed in government meeting rooms, in places of worship, in theaters, and many more are in use abroad. If your clients travel, they're going to encounter hearing loops in other countries. And telecoils give your patients access to these systems as shown on the previous slide. So in the places that have these FM systems installed, consumers can go and pick up a device and they're made hearing aid compatible through the use of a neck loop.

It's not an ideal way and it's not as convenient, but it's still a great way to hear what people are saying in the theater if you have a neck loop around your neck and turn your hearing aid to telecoil. Now, we've already talked about wireless accessories with built in telecoils they can be used. It's recommended that the telecoil is kind of the. The remote microphone is clipped to in that neck loop. It becomes a little bit tricky to do.

So clipping it to the wire of the neck loop will most likely overdrive the telecoil in that accessory. And in our opinion, accessories are simply not ideal. It's just another thing that you have to keep charged that you have to remember to bring with you. And note. And again, this is another slide talking about how

users can use telecoils or users can use hearing.

I'm sorry, this slide talks about how users without telecoils or non hearing aid users can benefit from assistive listening systems. And that means they have to pick up a listening device with headphones. The problems, of course, with headphones is that they're not ideal because they can cause feedback, and that's audible to patrons in the theater to their left and right, which can be sometimes perceived as very annoying. And again, they're not as good and give you not a good connection to that hearing aid microphone. And our beef with the signage is that frequently venues will say, hey, hey, hey, we have an assistive listening system.

But then they don't tell you where these assistive listening devices can be found. So it's frustrating that people don't pay more attention to solid signage in these facilities. And that brings me to the discussion about a future technology that we've certainly been hearing much about in the last three years called AuraCast. And it's an RF broadcast standard that uses Bluetooth low energy, which can be used as a future assistive listening system. And certainly there have been a lot of claims made by the Bluetooth Special Interest group and the hearing aid industry.

First of all, they've been implying that the telecoil is already on its way out and that somehow loops and telecoils don't sound good. And I've personally listened in hundreds of hearing loops around the country, and if the hearing loop meets the IEC standard, hearing loops sound terrific. Auracast, of course, promises stereo sound and good sound quality. No interference from electrical equipment, although some of that will still have to be proven in the future. Low latency, low battery use and a simple connection.

And the promise was originally as simple or as similar to turning on the telecoil. By the way, none of these claims have been tested yet by third parties and in the field. So consumers most likely and worldwide from the different organizations such as EFO and IFO and the center for Hearing Access,

have really focused on that last promise to make the make it a simple connection to AuraCast, similar to turning on a telecoil. So this direct to hearing aid connection is critical to make it easy to make it easy to use for consumers. That development is still that option is still under development.

So connecting to AuraCast consumer advocates are concerned that connecting to AuraCast will initially most likely require a handshake, meaning a device to connect to the AuraCast signal. It'll be either a smartphone, smartwatch or a remote device. But that will make the use of AuraCast difficult for individuals with limited dexterity, for those with limited cognitive abilities, or those who are not very techie, or those without a smartphone. And that includes my 98 year old mother. So AuraCast there are two ways that AuraCast broadcast can be used and they are often conflated at the personal level.

AuraCast broadcast for audio sharing will permit the sharing of sound from videos or music to other AuraCast compatible earbuds, smartphones, and compatible hearing aids. That part is a big deal. Audio sharing will also be possible from those silent TV screens that are used in sports bars and fitness centers and hopefully in airports. And it can't be stressed enough that this, a universal technology, promises to make life a lot easier for hearing care professionals. The timeline of personal audio sharing is expected to be shorter than oracast's second use, which I'm going to talk about in a minute.

But it will require the timeline is shorter because of course, we expect consumers to upgrade hearing aids and cochlear implants and smartphones and TVs and laptops in the next five, seven to 10 years. Of course, it's going to take some time for the hearing aid manufacturers to introduce compatible hearing aids and cochlear implants in all their models and in every hearing aid family today, late 2024. Most hearing aids are not ORACAST compatible. So if you've just been fit with a new cochlear implant and it's not ORACAST compatible, it could be six, seven, eight years or longer before you will be replacing that unit. It But a lot of excitement is about the future application for using AuraCast Broadcast used as a part of an assistive listening system with live sound.

And this mouthful, we will in our discussion today use the simple description AuraCast ALS, which is a different application than Oracast for audio sharing. AuraCast ALS is envisioned as a solution that could be a new assistive listening system, and while there is a lot of potential, it's unknown if and when These products will be fully tested and will be ADA compatible. So what's still needed for ORACAST ALS to be available and usable? First of all, we need an international standard, the International Electrotechnical Commission, the IEC 60118 17. For those of you who are keeping track, it's 601184.

That's the IEC hearing loop standard. But this new AuraCast IEC standard is yet to be published and the guidelines for that are slated to be released sometime late 2027. And they will finalize guidelines regarding latency limits and sound quality and connectivity requirements and more. We also need a dedicated AuraCast ALS stream. This option needs to come from AuraCast transmitters that has also not yet been developed in large venues.

Consumers need a unique sound mix with an enhanced SNR in large venues. This is not just simply a plug and play solution. And like I mentioned earlier, we prefer direct to hearing instrument connections without a handshake. That too has not yet been developed. And we also don't know how consumers will be able to handle microphone plus AuraCast capability and if they'll be able to quickly switch back and forth between microphone oracast or microphone and AuraCast like consumers are currently dealing or doing with microphone and telecoil.

And then we still need very thorough studies. We need practical, reputable third party studies that include a variety of people with hearing loss with a variety of devices, implant hearing aids, bone anchor devices, earphones, and we need to make sure that all of these devices can work with any auracast transmitter, regardless of the brand or the manufacturer, with any hearing aid receiver, and then the end to end latency that still needs to be studied. It must be acceptable for AuraCast users or assistive listening users as a rule of thumb, and that's currently still under review, it should be less than

30 or 40 milliseconds. This includes the delays caused by the microphones used on stage, the sound systems, the sound boards, the audio visual equipment, the Auricast transmission, and any delays caused by hearing aids. And last, last but not least, we need educated users to expect that any user will just be able to walk in and know exactly how to use aurecast with their hearing aids.

Having been involved with telecoils and hearing loops for a long time, that too is going to take time. We need the manufacturers to provide information in the user instruction guidelines that audiologists can refer to when they're doing the fittings. And the consumers will need to be educated by their audiologist. And you know, our point is that as long as IEC standards don't exist. How can products coming to market today and before December of 2027 meet these requirements?

It feels like the industry is doing this somewhat backwards, bringing out products before an international standard is released. So for the foreseeable future, if most hearing aids and cochlear implants are not compatible with AuraCast, most users will have to borrow a receiver from the venue. So it's expected that AuraCast will initially function as an FM system and it will require everyone to borrow an AuraCast receiver with headphones or a neck loop. And that means that this wonderful graphic, which of course sounds terrific, that anyone with earbuds, hearing aids, bone anchored hearing aids and cochlear implants can simply walk into a venue and connect to the AuraCast transmitter. For the foreseeable future, these hearing aid device users will have to go pick up an FM system that will probably look something like this with a neck loop so that they too will be able to hear the proceedings.

So it will likely take a decade or longer before AuraCast ALS will become ubiquitous. And in the meantime, our clients need to hear now. They need to hear today in the thousands of places in the US and around the world that already have hearing loops, FM and infrared systems in use. And I don't know if any of you have noticed, but we are specifically not mentioning audio over wi fi systems. If you are being asked to provide information about audio over WI fi systems, these systems are not a good

assistive listening solution for people with hearing loss.

It sounds ideal, but the delays that these systems cause and the technology obstructions that they provide for hearing aid users are just too many. And we highly recommend that you stick with proven technologies. We believe that professionals must speak up for clients and demand that the hearing aid manufacturers offer a wide product line of devices that are aurecast ready and include built in telecoils, not in an accessory. If you as a professional do not counsel your patient about assistive listening or include the telecoil in their hearing aids because AuraCast is coming, you're denying your patients their ADA rights to hear clearly and in communities today. And this is just a screenshot from a text that I received from an audiologist complaining that she was having a hard time finding hearing devices that use disposable batteries and include telecoils.

So just want to make you aware that if that's something that you've noticed, you're not the only one. So since 2009, national and international groups have written multiple declarations about the criticality of both telecoils and Bluetooth. And then on the right is the Budapest declaration and it was undersigned by a number of well known consumer organizations in the US in Europe as well as Australia and New Zealand. And a new declaration is currently circulating among consumer organizations for undersigning. So the demand for consumer organ from consumer organizations asking for telecoils in hearing instruments should not come as a surprise to the hearing aid manufacturers.

And if you're attending this session to make your community more hearing friendly, we will need another hour, which we don't have. I wish we did. But hearing loops, for your information, are still being installed. SR, FM and infrared systems with neck loops. And there's many papers that have been written on this topic on how you can foster a more hearing accessible community.

Karen and I are very happy to help you begin a hearing accessibility program or continue your community outreach. And then when the time is right to start advocating for AuraCast to be added to

those systems. And it's important to stress here again that AuraCast technology is not a plug and play system. Most likely sites will need the work from experienced AV engineers and assistive listening experts. So you make your community more accessible by offering a hearing loop in your waiting room.

Eventually, when that time comes, auracast so that you can train and demo the technology, speak up for your clients these systems. I live in a retirement community where I can see the residents here turning on their telecoils as soon as they sit down to attend meetings. But also talk about open captioning in theaters, demand patient education materials from your manufacturers and fit devices that include telecoil and Auricast, also known as ADA Access ready hearing aids. And we recommend that you start today. And again, we've already mentioned that you can get hearing loop lists in from your state from the hearingloop.org website.

And why are we talking about still about talking loops? And that's because they deliver such a punch, such a benefit to patients, right? And for those of you who've never seen this slide, consumers were asked so how well do you hear with your hearing aids on the microphone setting, where 1 means I heard nothing and 10 means I heard every word, the average response is I hear about a 5. And only 13% of the respondents rated their hearing ability an 8, a 9 or a 10. And as soon as they turned their telecoil on the average increased in 8.7.

And 86% of the respondents rated their hearing ability in 8 or higher. And that's exactly what we're talking about and hopefully Auracast will deliver that same punch when the time comes. It improves user satisfaction with hearing devices and it will certainly provide PR for you for your practice and frankly, for the whole hearing industry that money simply cannot buy. And my last slide. Again, we provide more resources.

The Hearing Loss of America Association's website has a terrific hearing loop toolkit. How to start looping in your community. The center of Hearing Access has terrific information and here are some

links to articles and papers and videos that you might find helpful. And that brings me to the end. Thank you so much, Dr.

Sterkins and Dr. MacLennan. We have a comment here from Amy. Amy is in Ohio and she's not an audiology professional, but she's an advocate. She attends a church where two of her members recently were fit with hearing aids and they requested telecoil, but they were told that their Medicare plan didn't cover that.

So now they have hearing aids that telecoil, it doesn't work. So they were very disappointed. And so what advice can you give to patients who have Medicare and are wanting telecoil in their hearing aids? Juliet, you can take that. I've been out of my practice for since 2012, so that's a long time.

Telecoils do not add to the expense of hearing aids. I am extremely surprised that somehow Medicare would not cover hearing aids with telecoils. I suspect that the provider who is providing these hearing aids may be limited to a certain brand and may find that if they want to provide Bluetooth, that somehow telecoils were not included. Amy, I recommend that you and I connect because this is the first time I'm hearing. And if there are participants in this group who are practicing and who are fitting hearing aids, I would love to know more if that is something that you are dealing with as well.

It's the first time I've heard of this. And this is Karen. This is the first time I've heard of that, too. There are certainly other options when fitting hearing instruments. I'm not familiar with any Medicaid requirement that would say t coils are not permitted.

It's just. It's very out of the ordinary. Yeah. Thank you for your question, Amy. We had another member.

They wanted to clarify. Christie, I'm just going to take over because I do see the question. It says that telecoils are not a big battery drain. No. If you switch from microphone to telecoil, the drain is exactly

the same.

The drain on the battery is increased as soon as you Switch to Bluetooth use. They are the big drain. But you can be in a hearing loop all day and it would not change the the drain on the hearing aid. You agree with that, Karen? Yes.

Now, if the telecoil is in the accessory, then again you're using Bluetooth technology and that would increase the drain, the hearing aid and of course these remote batteries. I'm going to a TEDX event tomorrow all day. That little microphone accessory would never work all day on one charge because of the excessive drain. I see. Another question.

Is it correct that the telecoil will still be needed with AuraCast? If your device does not include AuraCast, then yes, you're going to need a telecoil in order to hear in these thousands of places that use conventional assistive listening. And as AuraCast systems are installed, the AuraCast receivers will come with neck loops. And the only way to couple that is going to be through the telecoil in your hearing aid to expect now. So, you know, how soon is this all going to happen?

No one is going to mandate that places of public accommodation will replace their current assistive listening. This is a costly proposition for a lot of places. So these changeovers are going to take time. And again, all the technology must work seamless and easy. And as a hearing care professional, I've been involved for 40 years with New product rollouts from the hearing aid manufacturers.

And if there's audiologists in this group, how many of you have experienced glitches in hearing aid product rollouts? So to expect that tiny little hearing aids with tiny little antennas with tiny little rechargeable batteries are instantly going to connect to any AuraCast transmitter that is out there is wishful thinking. I want this to work. Hearing loop installations are involved and can be costly, but they work and they are easy to use. And so we do not want to throw the baby, the telecoil out with the bath

water before we truly have a good replacement ready.

And thank you so much to our guest speakers today. We'll go ahead and close out the classroom. We appreciate your time and your expertise, Dr. Sterkins and Dr. MacLennan.

We hope you enjoyed today's presentation. Thank you.