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Streaming Sound With Edge AI

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Welcome to today's course, Streaming Sound with Edge AI presented by Keeley Layfield. This month on Audiology Online, we're celebrating innovation in the hearing industry with our fifth Industry Innovation Summit. Thank you for joining today and we hope to see you in other summit courses which you will find in our course library. We would like to thank our title sponsor, CareCredit, and all of the companies who are participating in the 2025 summit. And now it's my pleasure to turn the microphone over to Keeley.

Hey everyone. Like Anna said, My name is Dr. Keeley Layfield and I'm an education and training audiologist with Starkey Hearing Technologies. And today I'm going to talk about streaming sound. But real quick, if you need to ask a question, please use the Q and A.

I'm going to look at those before we sign off for the day and make sure that I get all of those answered. There's also a PDF handout that you can access from the chat as well if you would like that. And then here is a quick risk and benefits analysis that you can see. Again, you can get this in the handout if you need to review this more fully, but today's learning outcomes are the ability to locate Starkey's streaming configuration for Edge AI products within the Profit software. You're going to be able to find where the demo stream feature is within Profit as well.

And then you're going to be able to discuss how patients can control their streaming via the smartphone application My Starkey. So now that we got all of the housekeeping out of the way again, today's course is designed to discuss our streaming sound with Edge AI devices. Edge AI brings a best in class streaming experience and today's course is going to provide a more in depth look at how streaming works, the controls that live within Profit and those patient driven controls within my Starkey. And then we're also going to talk just a little bit about connectivity basics. So Edge AI is a complete line of products in three different technology tiers so that patients can have a device style that fits their everyday wearing and listening needs.

If you need additional information on what styles Edge AI offers, reach out to your Starkey sales rep and they can get you that information. But our Edge AI product portfolio, they are all equipped with a 2.4 GHz radio as well as LE audio. So let's look at why these different connectivity options are available for Edge AI products. So taking a little bit of a step back, Bluetooth Low Energy was introduced in 2009 and it was initially introduced as an alternative to Bluetooth Classic with the priority of minimizing power consumption and maximizing battery life in wearable devices. So it offered the functionality of Bluetooth, but with lower power demands.

So it was really ideal for small devices that had limited battery life. So it allowed devices to connect over short distances and transfer small amounts of data. But it wasn't originally designed for audio streaming, which is often the source of some of its limitations. So when you look at the different Bluetooth options, there tends to be kind of two categories. Bluetooth Classic and Bluetooth Low Energy.

Bluetooth Classic has been used for years in audio streaming for transferring files, connecting devices like speakers and headphones. And then Bluetooth Low Energy was kind of broken down into proprietary Bluetooth Low Energy. So different phone manufacturers have their own proprietary audio streaming protocols, and these are the most often used ones in hearing aids today. But Bluetooth wanted to introduce a more universal streaming protocol with LE Audio, so this would negate the need for different protocols based on different phone manufacturers. So Le Audio itself can also be broken down into two categories, which is UniCast and Broadcast.

So unicasting through Le Audio allows for that one to one streaming connection that is very similar in functionality to Bluetooth Low Energy that you're used to working with now. So using this Unicast protocol of LE Audio, it allows Edge AI devices to pair directly with a variety of sources and stream directly from them. So LE Audio is going to expand the devices that the hearing aids can connect to and

it's going to provide an improved wireless range as well as an improved streaming sound quality for patients. Now that second portion of LE Audio will follow the new broadcast or oracast protocol. So this will allow for hearing aids to connect to a variety of broadcast sources such as large scale venues.

So think airports, arenas or select TV and media players. So think of anywhere that could potentially or is currently telecoil looped. It could flip to this oracast deployment in the future.

So in all the excitement around Le Audio and AuraCast, we know that at Starkey and with Edge AI, we need to still support older streaming protocols because they're not out of the way yet. So Edge AI hearing aids will support the iPhone proprietary LEA2 streaming protocol for current iPhone users. It will also support Android's proprietary streaming protocol, which is ASHA for current Android users. But in addition, Edge AI hearing aids are going to support the LE Audio streaming from compatible devices. So this includes the new Starlink, Edge TV streamer, compatible Windows 11 PCs or specific smartphones that have already transitioned over to this LE Audio and Edge AI devices are going to support AuraCast enabled devices as well.

But you're more than likely not going to start encountering these until sometime later in the year, in 2025. So it's very important for us to consider the future when designing Edge AI. So again, we wanted to ensure that our hearing aids were Future Ready and AuraCast Ready, even though it's not wildly commercially available yet.

Our two way audio feature for Apple devices allows those hearing aid microphones to pick up and stream voices directly back to iPhones and iPads. So this allows patients to very seamlessly talk hands free. There's also the ability to accept end or decline phone calls through the hearing aid user controls. But if your patient has an LE Audio enabled Android device, this will also give your patients access to two way audio. So this does make this feature no longer an iPhone exclusive feature.

So now that we've kind of looked at the different protocols that Edge AI will support, let's look at some basics of wireless connectivity that you may encounter with your normal daily clinic flow.

So one of the most popular enhancements that came out of the development of the Profit Fitting software was the fact that you and your patients no longer are required to turn off Bluetooth on a paired phone prior to trying to program. So the very first time you're connecting hearing aids to Profit, you're building a relationship within your patient's hearing aids for your specific programmer in your specific computer. Again, Bluetooth needs to be off the very first time you're doing this in order to build the relationship. But the hearing aids can remember five of these relationships. So anytime you come back to that same computer and same programmer, Bluetooth can remain on for that programming session.

Now, I do want to note that if Bluetooth is on, you will not see that orange box populate around the hearing aid card. If you're using that short press user control to identify the device. Bluetooth being on will also suppress any of those hearing aid card notifications that you may see. And you would not be able to pair an accessory within Profit again with Bluetooth being on.

Now, outside of programming, streaming is a very large part of that hearing aid fitting experience. So what exactly is streaming? So it's receiving an audio signal from an electronic source, such as phone calls, music, podcasts, or streaming from particular accessories. So we've talked about the different streaming protocols available, but let's look at how this process works kind of across all of them. So the amount of devices or the Number of devices that hearing aids can be paired to is going to differ by manufacturer.

But Edge AI hearing aids have the ability to be paired with up to five streaming devices in any combination. And then the Edge AI hearing aids can also support two simultaneous Bluetooth connections, but only one active stream at a time.

And then when we want to connect hearing aids to the software, or we're trying to pair them to a smartphone for the first time, pair them to an accessory, we need to put those devices into pairing mode. So whenever you are first powering on the hearing aids, they automatically go into that pairing mode for three minutes. So within this time frame, they're discoverable by programmers, accessories, or again, smartphones you're trying to pair them to. But you don't want them to be in that pairing mode all of the time because you don't want your patients to be able to just connect to anything. Let's say they're out in the grocery store and someone else is trying to pair something to their smartphone.

You don't want to accidentally have them. This stranger select your patient's hearing aids. So again, having those patients restart or power cycle their hearing aids will put them into that pairing mode when they need it to be in that.

So when a patient is ready to stream from a previously paired and connected device, Bluetooth is what's going to act as that bridge between the phone and the hearing aid or whatever they're trying to stream from. Now, there are a couple of different music listening strategies or music processing strategies. So maybe your patient's wanting to listen to music, but it's not streamed. So it's really important to have a unique music compression architecture. So the dedicated music program within Profit is going to work across that entire 10,000 Hz bandwidth to allow music to be processed without distortion and at proper loudness levels by using unique and optimized compression variables designed specifically for music signals.

So this can be enabled for any patient that may need this specific program. Now, for today, though, we are strictly focusing on streaming. So I want to talk about now our streaming configuration within Edge AI devices.

So let's look at the streaming processing controls that live within the Profit software. So with Edge AI, we are introducing a streaming configuration where there will be separate targets for streaming based

on your patient's audiogram and their acoustic coupling. So it's very important that acoustic coupling is marked correctly in the software because of this. So audio streaming configuration allows for separate streaming frequency response features, but there's no delay in activation, there's no silent stream issues, and it's not going to affect the volume or the frequency response of your patient's speech focused or non streaming programming again when streaming begins. So manipulation ability of this new audio streaming configuration can be found within profile from the fly out menu.

The audio streaming configuration allows you manipulation ability of that full streaming frequency response. So you as providers have access to either quick fit or fine tuning controls for this manipulation. So based on how you prefer to program, you've got multiple options and then when you make adjustments, you also have the ability to target match the streaming configuration if you need to kind of start over stream Target match will set the streaming configuration back at those streaming targets that again are generated based off of your patient's audiogram and their acoustic coupling.

Now, if your patient has made some streaming optimization through their EQ controls in my Starkey, which I'll show you what that looks like just a little bit later on know when you come to the audio streaming configuration page, you could potentially get this pop up. So this is just letting you know that the patient has customized their streaming signal. So anything that you're about to do is going to clear all of that out. So this can be really beneficial for the patient because what you're able to do in the software is a lot more precise and a lot more fine tuned than what the patient can do in that app. But again, we're just letting you know so that you can let the patient know what you're doing in the software is going to wipe out their EQ settings within the app and then from the audio streaming screen, you also have the ability to perform a live streaming demo in the software so the patient can stream from their compatible device to their hearing aids while you're making fine tuning adjustments.

So if you click start demo mode from that audio streaming page, the patient can begin streaming something from their smartphone and then you can proceed to make either those quick fit or fine tuning changes based on whatever the patient is looking for in their fine tuning in order to easily communicate with the patient while you're making changes, but without having to stop the stream. You can click mute stream so it's going to mute those hearing aid microphones and you can have an easy conversation with your patient. Unmute that, go back to making those fine tuning changes as needed. But you will not have access to any other screens within the profit software until you hit stop demo mode and kind of cut the connection.

So to ensure best results from that streaming demo mode, your patient needs to have their stream volume set to a comfortable level. And then while you are in that demo mode. They cannot use my Starkey, so they can't open it up or do anything from there. And their onboard user controls are going to be locked very similarly to how they are when you're programming already anyway. So heads up on that.

And then it is recommended that anytime you change the acoustic configuration on the devices and then change it within the software, you re best fit or target match the, you know, audio sound or the gain configuration for the hearing aids to account for new targeting for that new acoustic coupling. This is true for the audio streaming configuration as well. So if you hit best fit or target match all programs, it is going to update streaming configuration as well. Let's just say you're not changing anything acoustic wise. You've just done some fine tuning and maybe the personal program and you want to start over, but you don't want to change anything else, especially that audio streaming.

So do recommend in that case to hit best fit or target match current program. You're going to get this pop up and this is asking you do you also want to best fit or target match your audio streaming. And so again, if you're just kind of doing some fine tuning and personal and you don't need to change anything

else, hit no. But if you truly do want to start all the way over in that personal program and in the streaming configuration, then hit yes on this pop up.

Now maybe you don't need to fully customize the audio streaming configuration for your patient, but you're looking for a little bit more emphasis on certain frequencies. So you can change the streaming sound defaults within profit from the accessory screen. And so you have a couple of different options. Equalized is the default selection, but you also have Bass Boost, Treble Boost and overall boost as well. So Bass boost is a low frequency emphasis added to that audio streaming frequency response.

Treble boost is going to be that high frequency emphasis added and then overall is going to do a combination of bass and treble boost. So give that full boost to the frequency emphasis.

So I did mention this, but I do want to point it out again because this is something that you may get questions from from your patients. And kind of my cheaty little remember rule is the software trumps the app. So anytime you are making any changes to the patient's streaming signal from that audio streaming page, if you start doing the demo mode where you allow them to stream while you're programming, or if you best fit or target match all programs including that audio streaming configuration, this is going to wipe out the patient's equalizer settings within the My Starkey app. So if you remember nothing else from today, remember software Trump's app.

So we've talked a lot about the software and I've mentioned the app, but let's look at those streaming controls through My Starkey now so you know what your patient's going to see when they're within it. So again, My Starkey is the app that works with all Edge AI devices and this is where those streaming controls will live. So Edge AI devices do have that dedicated streaming configuration. So anytime streaming is initiated, the home screen of My Starkey will automatically become this streaming audio screen. So this again is that automatic switch for patients.

When your patients are in this, they can't customize their hearing sound quality, but they can customize their streaming sound quality so they have adjust sound or my hearing. Now I do want to note that the volume slider bar on the screen is going to change the volume of their hearing aid mic volume. It is not streaming volume control. If you remember, we now have contextual volume controls. So they can either use the phone volume control or if you've given them an onboard volume control, they can do it that way as well to control the streaming volume.

When patients are in this streaming configuration, they cannot swap to other programs because again, it's an automatic switch into the streaming configuration. So programs is going to be grayed out. If they try to click on it, it's going to let them know they can't do this. If they have an onboard program change, they can change it via the onboard, but it won't actually make the switch until they start streaming or stop streaming. So.

So heads up there now if patients hit adjust sound, this is going to be where those EQ adjustments live. So changes made to the equalizer will again trigger that pop up within profit. If you go to audio streaming, letting you know anything you do there is going to clear all of these settings out. And then the My Hearing audio streaming portion is where patients can access those different boost as well as their hearing aid mic offsets. Again, you can control these from the accessory screen within profit as well.

But if your patient maybe doesn't want to come to you to make you make those changes in the software, they can do them in the moment via the app themselves.

There we go. So the streaming equalizer will again reset if you have done any programming in the software for streaming. So I know I've said that a lot today, but this is probably the number one question that I get asked from patients and providers alike. That's why I wanted to hit it just a little bit harder today. So if you start that demo mode, you make any changes to the audio streaming configuration

where you best fit or target match all programs.

When connected to the profit software, it clears out these EQ controls for your patient. Now, on the home screen of my Starkey, you may have noticed little accessory icon in the bottom left corner. So this is now visible 100% of the time for Edge AI devices. When patients tap that accessory icon, they're going to see this streaming options page. So this is where they can start and stop streaming from the Starlink Edge TV streamer.

This is also where they can control streaming devices, which is right now a very generic label for any device that is sending an audio stream to the hearing aids. So think of this as kind of like your AuraCast control. As patients start encountering that, or if maybe they have the compatible laptop they can direct pair to, that's going to be controlled by that streaming device control as well.

So I've talked a lot about, you know, the new streaming configuration within our devices, but we didn't just do new for new sake. So the ability to stream wirelessly from a variety of sources such as phones, TVs and computers enhance the overall patient experience. But it can also introduce some challenges because as patients, they're highly individual, they have highly individual preferences. So each content type places different demands on the hearing aids. And then, you know, you're trying to fine tune all of this to get a high level of satisfaction across all streaming scenarios.

So we wanted to do a little bit of research on this and look at our streaming configuration within edge AI. So we had 45 different participants wearing various styles of edge AI devices. And they were encouraged to use them and stream them in a variety of scenarios from a variety of sources and then rate their satisfaction. Almost half of the participants rated their Edge AI streaming experience as very good. So this shows a superior streaming experience and it allows users to switch between acoustic audio and streamed audio with ease.

Very simple for them to do so. I hope that today's course really shows that Edge AI devices are designed to allow patients to listen with ease, including streaming signals. So if you want to learn more about specifically programming Edge AI, you want to learn more about our dedicated music processing, again, reach out to your Starkey sales rep. They can connect you with your regional trainer. We're happy to help.

And so Edge AI was really designed to provide better hearing for all through a wide variety of styles. Now, I threw a lot of information at you guys today. So if you need any resources or any additional information, check out starkeypro.com there you have access to all of our white papers, our quick tips, and more. We also do have a white paper on that streaming study that I discussed, so that will also be posted on starkeypro.com if you want to learn more about that and go more in depth on that research study. So thank you guys for giving me some time today.

I'm going to check check that Q and A and see if there's any questions, and it looks like we're clear. So thank you guys for giving me 30 minutes on a busy clinic afternoon. And I hope you learned a lot about Edge AI and our streaming protocol. Thank you.