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Foundations of Cochlear Implants: Nucleus Sound  
Processor Portfolio  
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- [Ryan] Hello everyone, welcome to our course. My name is Ryan Lopez. I am the Group Product Manager for our Nucleus Cochlear Implants. And today we're gonna be taking you through the foundations of cochlear implants, specifically focused on our Nucleus Sound Processor Portfolio. So, to get us started, I think it's always important that we look at Cochlear's mission. And overall, we are here to help people hear and be heard. And we specifically look at that in three different categories. One is we want to empower people to connect with others and live a full life. We wanna transform the way people understand and treat hearing loss. And we wanna innovate and bring to market a range of implantable solutions that deliver a lifetime of hearing outcomes. And that's something that we go to work every day and something we think about, you know, as we move forward with this industry and technology.

Our learning goals for today is we would like for you, after participating in the session, to be able to list the features and benefits unique to the Nucleus 7 Sound Processor. We want you to be able to list the features and benefits unique to the Kanso Sound Processor. And also to select the appropriate sound processor for your individual recipients and candidates. And this course is a part of the Foundation of Cochlear Implants series. So, first and foremost, Hear Your Way is, you know, it's really an overarching theme from Cochlear, in the sense that we want candidates and recipients to know that we, as a company, are offering technology that allows our candidates to hear their way. And specific to today we're talking about sound processors, a specific behind-the-ear option, a off-the-ear option, as well as going through all of the accessories that are available to our recipients, and really trying to stay strong to this theme of Hear Your Way, and making sure that every patient understands that their hearing loss is unique, that their lifestyle is unique, and that we are offering options for them that best fits their need. So I think we're gonna open with a video, and this is specifically on the Nucleus 7. And really highlighting some of those key features. All right, so nice video there. Really 45 seconds demonstrating, you know, the size of our

new devices, as well as some of the key advancements that we've made in connectivity, that we'll be taking you through today as well. So we'll jump back into the presentation from there. So this is really opening up about our Nucleus 7 Sound Processor, and really some of the key aspects. One is that it is the smallest and lightest, and only Made for iPhone cochlear implant processor, that delivers proven hearing performance. And so really summing up the fact that Cochlear has been able to make advancements with this device in terms of patient comfort and cosmetics, and understanding the importance of size and a lightweight device. And then secondarily, is really capitalizing on some of the advancements in connectivity technology, and our ability to incorporate that into a sound processor.

So some of the key features of the Nucleus 7 is, as I've kind of previously mentioned, one, it is the smallest BTE, so behind-the-ear device. And as we continue to move forward, generation to generation with cochlear implants, we continue to make sure that we are, we're making these devices smaller and smaller. And, you know, this is starting with an original device that was a body worn, and now we've come to a behind-the-ear that sits nicely on our patients. Second is we have improved our wearing options. We still continue to focus on SmartSound iQ, and now MFi, Made for iPhone. We also have True Wireless accessories. I think that true is the underlying theme there, as we do not use any intermediary devices. Patients can connect directly to a wireless device to improve their hearing performance in whatever situation that may be in. Up to 50% more battery life with the Nucleus 7. We have a Nucleus Smart App, which allows you to control and monitor your device. Especially for those candidates who really wanna have control over their hearing and for those parents who wanna be able to ensure that their child's device is working properly. We have an Aqua+ for Nucleus 7. Again, we understand patients' lifestyle needs, and water is an important aspect of that. That further peace of mind when it comes to protecting your processor. And then Hybrid Hearing. So as we, as an industry, as we continue to advance and patients have more levels of functional hearing, we wanna make sure that

they can take advantage of that, all within their same sound processor. So that's a quick overview of the features. As far as the device size, it is 25, Nucleus 7 is 25% smaller and 25, or sorry, and 24% lighter than the previous generation Nucleus 6. Again, capitalizing on the comfort aspect and the discretion of our device. Again, something that we wanna make sure we continue forward with our patients.

SmartSound iQ with SCAN. Also incorporated into the Nucleus 7. So this is the ability for the processor to automatically be scanning the environment that a recipient is in. And by that ability to scan the environment, the processor is making adjustments to settings and determining which environment that patient may actually be in. So if you look at the wheel itself, there are six different scenarios. Starting with the top right one, so let's say the one o'clock timeframe, you're looking at speech and noise. As we move forward clockwise around, you have speech, you have just noise, you have wind, you have quiet, and, of course, music. So Nucleus 7, again, carrying forward the ability for patients to have the device automatically adjust for them, and that's really important from a simplicity standpoint. We know historically, our recipients aren't always changing programs, remembering to change programs depending on their environment, so SCAN really helps take over that control for them and make sure they're hearing their best, in those situations. And I think I already covered these so quickly click through those, but you could take a quick look at those different environments. Also, we have our Nucleus 7 battery options. So we have three options for our recipients, starting with a standard disposable, which would be the option on the far right. And that allows our recipients to use disposable batteries. The middle one is a standard configuration for rechargeable, and then we have a compact rechargeable battery. Essentially your battery life, and the amount of battery life you're getting, is highest from your disposable, down to your compact rechargeable. So that's basically the smaller you get, it reduces that battery life, but we still see great battery life out of the Nucleus 7, with some of the recent changes we've had, as we'll cover later. As far as simplicity and, you know, our recipients being able to be on the go,

historically we've had a charging station that needed to be plugged into a wall. And today, with Nucleus 7, we have actually moved to two different types of chargers. The first is on your left, it's the Y-charger. And the great thing about this is it's mimicking the everyday use of our recipients. So the same way in which they attach and detach their battery from their processor, it is the exact same motion that they would be using with this Y-charger. So in this Y-charger you can charge two batteries, plug that into a wall using a USB cable and a standard plug. And then we also have a USB charger.

So this is something that could be put on someone's key chain, and essentially it will be able to hold one battery. So if you had a battery on your processor, it would hold an extra one within the case. And then you can plug this in to any USB configuration and charge a battery on the go. So very convenient battery charging options and, again, mimicking that everyday use. We have a new SlimLine coil cable, so, you know, in addition to actually reducing the size of the sound processor, we have incorporated the cable and the coil into one single piece. And by doing so we can actually enhance the connection aspect and then reduce the profile of the actual coil cable itself. So when you looked at our previous generation, Nucleus 6 Coil, and then you carry that over, this is just a nice visual to show, you know, as far as the profile of our new coil, that it's much smaller. And I think, from a convenience standpoint, from patients who like to wear hats, or are having to wear glasses, that this can really help with that configuration for them and then their lifestyle. As far as coil length, we offer an eight, sorry, six, eight, 11, and 25 centimeter. And then magnet strength starting at half, and then one, two, three, four, five and six, so six being the strongest magnet. So we continue to carry that forward with the Nucleus 7. We have some really great retention options, and this really falls under, you know, we talked about Hear Your Way and we wanna ensure that recipients understand that we offer them options for them to wear their way. And with Nucleus 7, we're delivering several retention options for them that can help promote more active lifestyles. So we have a safety cord on the left that allows you to clip that to your collar or to a shirt, and ensure that your processor is, if it

falls off that it's not gonna go anywhere. We have a tamper resistant ear hook, and this is really key for our pediatrics.

We wanna make sure that we can lock an ear hook on there so that it can't be removed. We have an ear mold adaptor. And this ear mold adaptor actually allows for a recipient to wear the sound processor, attach this ear mold adapter and then ear mold to it. And it's really about retention. So this is not about acoustic amplification, but you can get further retention using that ear mold adaptor. We have a head-worn adaptor, and this is kind of the end of the day. You get home, you're sitting in front of the television. You wanna get your processor off your ear. And you can actually clip the full processor, so the coil, the cable, and the processor itself, into this head-worn adaptor configuration. And then just wear that on your head. It's very similar to an off-the-ear configuration, but, you know, obviously with retention, not recommended for you to be walking around or going on a run. This is really about just getting that processor off your ear at the end of the day. Snug fit, you know, pediatrics or adults with smaller ears, you can get additional retention where the snug fit comes around the lower portion of your pinna. The hug fit is actually full circumference. So it's a silicone, very soft, very comfortable portion of this hug fit that comes around your ear and just gives you that further retention. And then last but not least, we have a Koala clip, and this is really for our pediatric patients and your ability to clip the entire processor to somewhere, their clothing, where they can still be getting sound with the coil coming up to their implant. So it's getting the weight of the processor on a small child off their ear. So that's really some of the key aspects to our retention options. Something that we were really excited about when it comes to Nucleus 7.

And as far as Hybrid Hearing, I did mention before, you know, for those patients who have residual hearing, and specifically functional hearing, that's something they can gain benefit from acoustic amplification. Of course the Nucleus 7 is hybrid ready, and you can attach a speaker unit. We have three different types of receivers now. We have

a 100, an 85, and a 60. Each one tailoring to an amplification that you would need from that receiver. And then we have specific domes options there for our recipients. And clinics can order custom ear molds as well if a dome is not something that they would like. And Cochlear can help with that as well. So Hybrid Hearing ready for all Nucleus 7 Sound Processors for our functional hearing recipients. I did mention previously the Aqua+. So we have what's called a IP68 Ingress Protection for water and dust, and IP and 68, that's the level of water resistance. And IP68 is one of the highest levels that you can get. We have a rotating collar to prevent twisting of the coil plug. So if you have experience with the Aqua+, sometimes the way that the configuration looks, sometimes our recipients thought they would have to twist to actually remove the coil from the sound processor. And so what we've done is that actually we've incorporated a rotating collar around that, because if you do twist, it's not gonna twist the cable itself and so we wanna continue to reinforce that you pull directly straight out from the processor. And if the recipient doesn't inadvertently twist, this collar will prevent that from causing any damage to the coil and the processor itself.

We have blue strain relief to differentiate the coil from a standard coil. So you know that you're looking at a Nucleus 7 Aqua+ coil. And then we have a new sound processor ear hook. So it's a nice, flexible design. It's designed for comfort and keeps that, keeps that ear hook in place. Some good advancements on the Nucleus 7 Aqua+ as we continue to make sure we're advancing in our accessory options as well. Nucleus 7 is the first and only Made for iPhone Cochlear Implants sound processor. So what that means is you can actually connect the sound processor directly to your phone. And that does not require an app as an intermediary device. It's a direct connection between the phone and the processor within the accessories section of the iPhone or Apple device. And we are using something called Bluetooth LE, which is Bluetooth Low Energy. And what that is, is it's different than Bluetooth classic. Bluetooth Low Energy allows the use of less battery life, to make sure that we can have this connected. And I think that's something that's a really important aspect to what we

brought forward with Nucleus 7 and Made for iPhone. Had we used the Bluetooth classic configuration, or connection, then actually that would be more draining in terms of battery life. So this Bluetooth Low Energy really enables it to not only be a great feature for our recipients, but also that it doesn't cause a drain in battery life and ensures they're still getting a full day out of their processor.

So really important aspect of that. And we've moved, you know, for, as you look on this slide here, we've moved from having wire connections to a dongle or an intermediary device. We still utilize 2.4 gigahertz in our True Wireless accessories, and now we have this Bluetooth Smart, which is really direct to device. And, as I mentioned before, you can stream, take phone calls, and, you know, hear audio directly from the phone to the processor, without having any intermediary device. I think I go into a little bit more detail here. So as far as another world first in connectivity, we're the first ever CI sound processor with direct audio streaming, including bimodal from a compatible Apple device. So if you have a compatible ReSound hearing aid, you have a Apple device, and our Nucleus 7 Sound Processor, when you're wearing both your hearing aid and your sound processor on opposite ears, you can actually take a phone call and it will stream the audio directly to both devices simultaneously. So very cool aspect to our connectivity, and really a first step and something we wanna continue to capitalize on as we move forward to the future. As far as connectivity, so I really, I mentioned before the direct device. And we've also taken another approach to that as well, and that's the ability to download the Nucleus Smart App. So if you go onto the Apple Store, if you go onto the Google Play Store, essentially Google Play, specifically with your Android devices, you can download the Nucleus Smart App. And then that Smart App can be used to control and monitor the Nucleus 7 Sound Processor. And, you know, this advanced control allows you to change programs, allows you to change volume, allows you to actually toggle through different wireless accessories. You have the ability to monitor your device and some other really cool features that I wanna touch on in a second here. But, again, really a first step for us with our Smart App and

the ability to control, monitor your cochlear implant sound processor. As far as Android connectivity, I will make sure I wanna be very specific on this as well. So I mentioned before you have Made for iPhone with Nucleus 7, and that means you can directly connect to the phone. With Android devices you can actually directly connect using the phone clip. So in this configuration, if you have a recipient who has an Android phone and they wanna be able to take phone calls, they will still need to use the phone clip. In this configuration, they would answer their phone. It would connect to the phone clip, and then go directly to their sound processor, and, of course, bimodally to their compatible GN ReSound hearing aid.

So that's really that key aspect of Android direct. And you have to use the phone clip. As far as the Nucleus Smart App, as I previously mentioned, you can connect through your, you can download the Nucleus Smart App on Android or Apple devices, and then you'll be able to control and monitor your sound processor. So let's jump into a quick video that really talks to the real world application of our Nucleus Smart App. It's a great video there, and, you know, I think the music and the way in which it was filmed is, you know, always gets a smile out of everyone. Especially the first time they see it. But really it does speak to the real world application of a specific feature within our Nucleus Smart App. And that is essentially our Find Your Processor feature. And what that is, is it's actually, there's two aspects. One is if a recipient loses their sound processor, that Smart App actually will drop a pin, based on the last location that it was connected to that processor. So, of course, within the range of the device. So, essentially, as you see there if a child is playing at the playground and their device is lost at the playground, let's say the parent's packing up or maybe they're already on their way home and they realize that the processor is missing. They can open up the app, they can see where that processor is located, back to the playground. And they can go back and get the device. So that is true with both Apple and Android devices, so regardless of which device you have. The other really great aspect is let's say you're at home and the processor gets lost in the couch. You're within a range, the actual

Smart App, instead of being in a map configuration and showing you where it is, it'll actually give you a, it's called nearby feature, and it'll give you a proximity meter. And basically, as you get closer to the processor, the meter will increase, kind of giving you a hot cold type approach to ensure that you can actually pinpoint exactly where your device is, and in my example, right there in the couch cushion. So, again, that is something that is also available with both Android and Apple devices. So very cool feature from the Nucleus 7.

And again I think, from a recipient standpoint, it gives them peace of mind and especially, probably even more so from a parent standpoint, as their children are running around and getting into different things. So Find My Processor, again part of the Nucleus Smart App, and within the Nucleus Smart App. So part of that device there. We also have a hearing tracker. So hearing tracker, as a clinician, you have access to data logging. And data logging is really important to understanding how these devices are being worn, what configurations, what environments our recipients are spending time in, to really make sure that we're personalizing their hearing experience and making sure we're understanding where they need to be going, to improve their performance. Hearing tracker actually puts some of this in their hands. And it gives them really two key aspects. One is it tells a recipient how much time they're spending in speech. And it also tells a recipient how many coil offs they're having. And it's measuring that on a daily basis. And so really, it's about wearing time. And not only wearing and having your processor on, but then also, how much time are you spending in speech because we know, based on clinical research, that the more time we have in speech or access to speech, that we can see improvements in terms of patients' hearing performance. So really having that control and allowing patients to visualize that. And, of course, if you can see this data, you can set goals within the apps. You can say, you know, I'm spending about two, three hours a day in speech. I wanna increase that to four. And you can actually have the app set that target for you so that you know that you're not, you are reaching your goal and you're getting that

four hours. So that's from our hearing tracker standpoint and really taking some of the data logging and putting it into our patient's hands, and allowing them to set targets and monitor that. So a great aspect, again that hearing tracker is within the Nucleus Smart App. Next we have the CR310 Remote Control. And the CR310 Remote Control is, if you don't, if you have a recipient who is using the Nucleus Smart App, they're using their phone through an MFi standpoint, to control their processor, and maybe they want a small remote as well. Something that they can just simply control volume, T-coil, and change programs, so we continue to offer the Nucleus 7 with the CR310 Remote Control. In the United States and Canada, this CR310 is part of that system. So if a recipient chooses the Nucleus 7, they automatically get this remote as another control option. So expanding on really connectivity and control.

One is really around True Wireless. And Cochlear focuses on wireless accessories as something for our recipients for those more difficult or unique environments. So starting with the TV streamer, you know, you can actually connect this TV streamer to your TV and then you toggle your sound processor to the TV streamer as your True Wireless accessory, and you can actually hear directly the audio to your sound processor. So no more turning up the volume on the TV for all to hear. You're getting that audio directly streaming to the processor itself. The phone clip, again I mentioned before, we have made advancements with this Made for iPhone technology with Apple devices. For Android users, the phone clip is still a great option. It's the ability to take a phone call directly to your processor through the phone clip, and also audio streaming from an Android device to the Nucleus 7. The Mini Microphone 2+ is also something that is really important, from a performance standpoint, specifically hearing and noise. And hearing and noise can be a difficult situation for anybody with hearing loss. Even those who have moderate losses. We know hearing and noise is something that, you know, it can be a struggle. And with the Mini Microphone 2+, you can clip that directly on to somebody. So a teacher, for example, can clip the Mini Microphone 2+ on, as an alternative to an FM system. You could have that clipped on to somebody who's giving

a presentation at your office. Or you could be at a dinner, a noisy restaurant, and maybe you're sitting with three other individuals. You can actually lay down the Mini Microphone 2+. When it lays down, it'll recognize that and it'll move into an omni configuration. So you put it in the middle of the table, and it's now picking up all of the conversation at the table and you're able to improve your understanding in that noisy environment. So, you know, I mentioned earlier the key aspect is True Wireless, and the True standpoint referring to the fact that all of these are directly connecting to the sound processor, no intermediary device. As far as FM goes with the Nucleus 7, we have a couple of options. Obviously, one we do focus on the Mini Mic 2+ for the classroom, which I just mentioned. We do have a receiver from Phonak, it's the Roger 20. And actually that receiver, you can actually connect in between the processor and the battery. And when that's connected, then you can use, it can connect to other universal FM systems, so you can use that FM technology through the Roger 20 receiver. And, again, you can see some other intermediary devices. You can connect an FM receiver directly to the Mini Mic 2+ as well.

So there are several options to this, and I would encourage you, when it comes to FM connectivity, you can reach out to your Cochlear representative. And we have several resources focused specifically on wireless in the classroom, FM connectivity, to further elaborate on the several options that our processors provide. We do have a monitor earphone adaptor, and this image, I'll draw your eye to the left, focusing on just the processor only section. So the monitor earphone adaptor with the Nucleus 7, it connects between the sound processor and the battery. And then you're able to actually connect the earphones to the monitor earphone adapters. This is your way of listening to the device, listening to the microphones, ensuring everything is working. And so that monitor earphone adaptor is something we offer when you're ordering a Nucleus 7 Sound Processor as part of that system, if you choose to. On the right, you can see that they're combining several configurations, so you have your Nucleus 7 Sound Processor on top. A Roger 20 FM receiver. A ear monitor, earphone adapter

and a battery module. And I think this demonstrates really the connectivity aspect of the Nucleus 7 and how we're utilizing different accessory options, without sacrificing, of course, the performance of the device and the ability for patients to continue to wear that device behind the ear. As far as bimodal connectivity, so Cochlear and Nucleus 7 is the world's only smart bimodal solution that's Made for iPhone. And we touched on this a little bit earlier, by using compatible LiNX 3D and Quattro GN ReSound hearing aids, you can connect both devices to your Apple device and using Made for iPhone technology and Bluetooth Low Energy, you can actually stream directly to both your cochlear sound processor and your GN ReSound hearing aid. And you could do the same with True Wireless accessories as well.

So we mentioned earlier the Mini Microphone 2+. If you are a bimodal recipient, you have bimodal recipients in your practice, they'll be able to also be streaming directly from a Mini Microphone 2+, for example, directly to both devices. So really enabling maximum performance in those real world hearing situations. As far as Nucleus 7 performance and noise, the Nucleus 7 has significantly outperformed the Nucleus 5, and our noise performance were comparable to the Nucleus 6. Again, we're using SmartSound iQ, we're using SCAN with Nucleus 7 and Nucleus 6. And, you know, here is really, here is the second noise condition where speech comes from the front speaker and noise from three speakers located to the sides, and the back. And BKB sentences were again administered adaptively to provide an SNR for 50% intelligibility, this time using that four-talker babble. All patients were again tested with Nucleus 5, the Nucleus 6, and with the Nucleus 7. And, again, I'll mention the results for Nucleus 6 and 7. Both used SCAN and were comparable. And the results for Nucleus 7 were significantly better than Nucleus 5, which does not have access to SCAN. And with Nucleus 5, those patients were using beam noise settings. So I'm really just focusing in on making sure that we are continuing that hearing performance using SmartSound iQ and SCAN with Nucleus 7. As far as implant compatibility, so this is always a question that arises, and, you know, Nucleus 7 is compatible with our Profile series and CI 500

series implants. So as you can see in the left column, that includes the CI512, which is our Profile Contour Advance. In the US, specifically, it includes the CI522, which is our Profile with Slim Straight. The CI532, which is Profile Slim Dialer. And the ABI541, which is our Profile Receiver Simulator with the ABI electrode, brain stem implant. As far as the next generation, it's the 24RE, or Freedom, as some of you may, they maybe still call it. But the 24RE contour advanced, 24RE straight, the Hybrid L24, our CI422, which is the 24RE receiver simulator with the slim straight. The CI24R implants. And then last, the last group is the M series. So we have the CI24M, which is our original straight electrode. This Nucleus ABI24M and the CI24M with Double Array. So these are all of the implant generations that the Nucleus 7 is compatible with. And, again, reaching far back into cochlear implant compatibility, as far as our implant generations. So we're gonna shift gears after we've kind of closed our Nucleus 7 overview of features and benefits, and we're gonna focus on our next sound processor, or our other sound processor within our portfolio, and that is the Nucleus Kanso device. So the Nucleus Kanso device is an off-the-ear sound processor. And I am going to open this one up as well and play a video for you, specific to--

- I was diagnosed with Meniere's and told that you've lost your hearing and it's not gonna come back. As a Chief Operating Officer, it's important to be able to hear the difference between figures, whether it's a million or a billion. I also love my music and when you're not able to hear the range of sounds, when you're hearing impaired, it makes it really difficult to appreciate music the way that I used to. After having an implant, it's really opened up my opportunities and brought life back to what I used to have. If there was anything that bothered me about the Cochlear was I never wore glasses, and when I had to wear an over-the-ear device, it was really uncomfortable. So, for me, when I put the Kanso on, it was if I wasn't wearing anything. I forget that it's even on. It's that lightweight. The comfort factor for me was really, that was the sell for me. When somebody notices that I'm not wearing Nucleus 6, they'll ask me what's happened, and then I have to turn my head to show 'em that I've got this new device

on, and it's so small that they can hardly see it. The sound was brilliant. That was one of the concerns that I had. Would the sound quality be the same? And, for me, I can't tell the difference. What I really like about the Kanso device is that it's simple to use. I put some batteries in, press a button, and you're off and running.

- [Ryan] Okay. So great introduction video to Kanso and I think it speaks really specifically to that original theme I mentioned, which is around Hear Your Way. And as we kind of go through the Nucleus Kanso Sound Processor, I just wanna preface and make sure that you're aware that this is a sound processor portfolio. And so a Nucleus 7 is something that is offered to our recipients, and Kanso is something that's equally offered. So it really comes down to their choice and something that's specific to their lifestyle. And as that gentleman in the video mentioned, you know, BTE, or behind-the-ear sound processor, really wasn't something that they, he valued. And so really the off-ear Kanso device spoke nicely to him. So, as far as Kanso, we focus on three key areas. Small, simple and smart. And those are three aspects of Kanso that we wanna continue to deliver on.

As far as small, Kanso is actually the smallest sound processor, or smallest off-the-ear sound processor in the industry, and you can see, basically, we're taking a BTE configuration that includes the coil and the cable and the processor and the battery, and we're incorporating it all into one single device. And you can see some of the dimensions here but, essentially, I apologize, this Kanso device sits just right over the implant magnet and coil, off-the-ear, and allows us to deliver the same great hearing performance out of a different configuration, that might appeal to specific recipients or candidates. It does come in several different colors. Again, we wanna, this is primarily something, a device that is over the implant, obviously off-the-ear, that hair color and discretion can be very important, so we offer several different colors, from a Kanso standpoint. As far as simple goes there's, again, I mentioned previously there's no need to change programs. So with Kanso you have SmartSound iQ, using SCAN.

Again, it's constantly scanning the environment and automatically changing to the environment, and maximizing the performance for that patient. As far as microphones go, in off-the-ear configuration, there are still dual microphones and dual microphones, as you know, from hearing aids to cochlear implants, has become standard of care, showing significant improvement over single microphones. That's something that, of course, with Kanso, we wanted to make sure we deliver that, that same great performance with as well. And, you know, obviously enhancing people's performance in noisy environments. So here is a comparison between the Kanso and the Nucleus 6. But you can see CNC words in quiet, scoring no significant difference from our Nucleus 6 device.

And then, of course, in noise, again, showing no significant difference in terms of SRT and speech intelligibility and noise, using Kanso versus Nucleus 6. So, overall, you know, the outcome here is that Kanso performance is similar to behind-the-ear devices, in quiet and noise. If you're asking, well that's comparing the Nucleus 6, you know, previous in this presentation we showed you Nucleus 7 and Nucleus 6 are comparable. And so really we show that, across the board in terms of performance, Kanso and Nucleus 7, from a BTE standpoint, are similar. And that's really important for patient choice, definitely. We wanna make sure that it's not a performance aspect that they're choosing on, but really the configuration in a preference. As far as Kanso using dual microphone technology, and, of course using SCAN, we were able to test the different configurations, both standard zoom and SCAN, and, again, the key takeaway that Kanso dual microphones work effectively. The default SCAN program delivers maximum benefit in noise. So we see a 2.5 dB improvement with SCAN over a standard microphone directionality configuration. So, again, showing great performance in terms of those more difficult environments. As far as simplicity goes, you know, I think, from a Kanso off-the-ear device, that might be something that a candidate really values. They want something that they can set it to go. They want something that they're not gonna have to change their program, which is what SCAN

delivers. And they want something that maybe they don't wanna know or happy reminded that's there and, again, off-the-ear configuration helps to promote that. But really, it's cable free. Single unit, one button. There's no need to change programs, as I mentioned, and an indicator light can be set, as desired, specifically for parents of pediatric recipients who they wanna ensure that they visually can see that that device is working. As far as Smart goes, you know, here we also make sure that we have that True Wireless connectivity. Again, previously, I mentioned kind of this progression going from wire to indirect wireless, which is really that intermediary device, and then finally that direct to device wireless.

So using 2.4 gigahertz with the Kanso device, you can connect directly to any of our True Wireless accessories. And, again, reinforcing those are the Mini Microphone 2+, the TV streamer, and then, of course, our phone clip. As far as the ability to control and monitor the Kanso device, we have two configurations. So we have a CR210 Remote Control. Again, this is something that's for your pocket. It's something more, you could put on a key chain if you really wanted to. But the idea, with the 210, is that it's small in size. You can change key aspects of volume, sensitivity, switch programs. You can start streaming through the telecoil and that remote uses a disposal battery that gets you, of course, several days, weeks of battery life out of that. I should say weeks, not several days. The CO230 Remote Assistant. This is our full featured remote. And so this is specifically for the Kanso device. So you can basically control and monitor. So you can do one click for a systems status. You can see on the screen that you're checking the device, the coil, everything is functioning properly. And then, of course, looking at your battery levels. You can control streaming from multiple devices using this, using your CR230 Remote Assistant. You can adjust your processor settings and then this, of course, is charged with a USB charger. So you would charge that similar to a phone, when needed. So really two ways to control your Kanso device, and it's naturally gonna come down to your patient's preference as well. So Aqua+ is available for Kanso, which is great. You think, maybe, in an off-the-ear configuration, that that's

not something that patients would have access to but they do, and it's designed, specifically, for this device. It's a reusable, sealable cover, that keeps, you know, the Kanso Sound Processor dry using use or around any kind of water. So some of the details on that. It can be used up to three meters, which is almost 10 feet, for up to two hours, and it is still that Ingress Protection of 68 rating and level. So, again, a very high IP rating. Can be reused up to 50 times with appropriate care. And that is something that you wanna ensure that parents after using that, they also make sure they just wipe it down before its next use.

Make sure we get all the chlorine off of there and ensure that you get that appropriate care, if someone's in that pool, for example. It is intended to be used with specific disposable batteries which Cochlear has detailed when you order it. And then users should be able to self-report discomfort. So if there is somebody who is not having an ideal user experience with that, they should be able to self-report that. So just some of the key details of that. We also offer a safety line which, again, adds additional peace of mind from a retention standpoint. As far as the Kanso implant compatibility, it's essentially the same as the Nucleus 7. So really our profile CI500 series, our CI24RE or Freedom series, as you may know it, and then our 24M Implant Receiver Simulator and all of the electrodes that are available on that as well. So same compatibility as the Nucleus 7. Connect Your Way. So Connect Your Way really speaks to, you know, how we take our sound processor portfolio and really summarize, for our recipients, what they have access to, based on their lifestyle. And we've broken this into four categories. One is we have our Made for iPhone. We have Nucleus Smart App. We have True Wireless Accessories. And we have remote controls. And I've covered a few of those earlier in the presentation, but if we look specifically at those I'd love to be able to recap some of the data that we've seen from this. So the Nucleus 7 allows you to download the Nucleus Smart App, and you can download that, again, on Apple, iTunes Store, or the Google Play Store for your Android devices. And we found that 90% of users found it more convenient to control their Nucleus 7 Sound Processor

with the Smart App, compared to using a remote control. And I think one is it comes down to convenience. So you have, you know, by using your phone, something that most of your recipients have with them already, a smartphone, whether Apple or Android. And you have the ability to actually do everything and more with that device, versus having a separate remote. From a convenience standpoint, I think that's really important. Not to mention within that, we've built in some of the key features I've touched on as well, which is the ability to track your hearing progress. So how much time and speech. How many coil offs is your child experiencing a day, for example? And being able to set goals. Control and adjust and monitor your hearing. So the ability to get into the app, adjust your volumes, adjust your programs, change your wireless settings, sorry change your wireless configurations, and toggle through your different accessories.

And then last but not least, I mentioned, you know, find your processor and locate a missing processor. So, again, within that, for both the Nucleus Smart App on Apple or Android, you have two options of locating it based on the map and a dropped pin. Or you have the option to use the proximity meter, if you're nearby your processor and within range of that. So, again, making sure we capitalize on that connectivity. From the operating system requirements, I have mentioned this several times about Apple compatible devices and Android compatible. Here's some of the specifics, which can also be found on our website. But with Apple devices it's iOS 10.0 and above. You go and you pair within the settings option and you can control with the app on your iPod or iPhone. And so you can do all that with your compatible Apple devices. With Android it's Lollipop 5.0 and Bluetooth 4 and above. So that's the operating system, and Bluetooth configuration. Again, you pair within the app and so that's different. So with Made for iPhone you pair within settings. With Android, you pair within the app. And then you control within the app. So that's some of the detailed differences between Apple and Android. And really, as I mentioned earlier, from a simple standpoint, it just comes down to Apple, you can directly connect to the phone. With

Android, you connect through the app, essentially. So pairing through a smartphone, Apple versus Android, I think this is actually just going into a little more detail on some of the, how you actually do that. So as you can see, on the left, with Apple devices you click on settings. You click on general. And then you go to accessibility, and from that screen you'll be able to pair your device, your Apple device, roughly, to the processor. And with Android devices you actually open up the smart app and you pair within the smart app itself. So just, again, highlighting that key difference. As far as controls go, this is just a closer look. On the home screen you can do volume, program and audio sources. And then within the status screen you can see battery level, audio level meter and sound processor status.

So some of the key differences there with controlling and monitoring. Made for iPhone standpoint, this really allows our recipients with Apple devices to connect with their family and friends on the phone. Also using FaceTime. Rediscover the joys of music through direct streaming. So your ability to open up iTunes and play music directly to your sound processor. And then you can practice listening with videos, music, books on tape, podcasts, for example. And I think, really, you know, highlighting the access to speech that this connectivity brings our recipients. And, again, I mentioned earlier, you know, the importance of spending time in speech, accessing speech, and how that can have an impact on patients' rehabilitation and performance. And so, really, this Made for iPhone connectivity opens that up to even more access for recipients. Our True Wireless accessories. Again we have our wireless TV streamer. Our phone clip for, specifically, for patients who have Android devices and wanna take calls directly from their Android and have that go through the phone clip to their sound processor. And then, of course, the Wireless Mini Microphone 2+. And then we also offer the Wireless Mini Microphone 2, which is a smaller configuration, and does not have that omnidirectional feature when you lay it down. The same way that Mini Microphone 2+ does. So Mini Microphone 2+, I did mention this previously, and I think one of the key aspects to this is obviously it's portable. It does allow you some access to FM. And it

has a built-in telecoil. So, essentially, you can connect an FM receiver directly to this, and gain access to several different FM model types, going directly through the Mini Microphone 2+. And then last but not least, though I did mention earlier, is the range of over 80 feet with a clear line of sight. So, you know, for a child in the classroom, you clip it to the teacher. You have 80 feet, as far as the range, for the connectivity between the Mini Microphone 2+ and the sound processor itself. Improved hearing performance.

So with Mini Microphone, again, this is really specifically those noisy environments. You know, this is a study that was done with 16 patients who have the N6 sound processor, and you can see that the Mini Microphone, in yellow, significantly outperforms the processor alone, which is in gray. As the noise levels increase specifically. The speech, in this case, was at 65 dBA, and you can see significantly better speech understanding, even in a very bad zero dB SNR signal to noise ratio. Another benefit of the mini mic has been seen on the right. So increasing distance between the speaker and the recipient can obviously decrease the speech understanding. So directional microphones, here in the light gray, improve this, but have the same effect of decreasing performance over increasing distance. So with the mini mic, increasing distance, obviously, does not decrease speech understanding, resulting in a 23 dB improvement in SNR at six meters. So, again, that mini microphone is connected to the speaker. So we see both better speech understanding and noise over the sound processor alone, and then, of course, as that distance increases, the mini microphone attached to the speaker does not see that deficit in speech performance. More choices in the classroom, I did mention before you could connect an FM receiver directly to the Mini Microphone 2+. And it maintains that dynamic FM signal across the wireless connection. I really, I think, when the school wants to use FM, the receiver's plugged into the mini mic and it can be placed anywhere within 30 feet of the child. So when the FM is being used, the child streams from the mini mic and the dynamic signal from the transmitter is maintained for the student. So, in this

image here, you can see the mini microphone is still on that child's desk and it's transmitting to the FM transmitter. So that's receiving from the FM transmitter. Our phone clip, this is Bluetooth-enabled, hands-free streaming. You can place and receive calls, you can adjust volume at the touch of a button, without having to take the phone out of your pocket. And then you can stream audio with the phone clip as well.

So music, videos. I love the example of GPS, so you're driving along. You can stream the directions directly through the phone clip, to your sound processor. And, of course, you get quality sound and when paired bilaterally, using two cochlear implants, or bimodally, with one implant and one GN, GN ReSound hearing aid, I mentioned previously that you can, you can stream directly to both simultaneously. And this phone clip provides six hours of talk time and 80 hours of standby time, with just a single charge. Good battery life there as well. TV streamer. Again, so we mentioned this earlier. The TV streamer significantly increased understanding of speech from the television in quiet and noisy conditions. And, you know, in this study we had the same six subjects as the Mini Microphone and the phone clip study, who had preferred listening modes. Three preferred unilateral and three were using bilateral. But, essentially, the test set up was with the TV streamer connected to a TV located 4.1 meters in front of the subject. The volume was set to the most comfortable level while listening in quiet without the TV streamer. And so the results of this one were statistically significant improvement with the sound processor and the TV streamer condition in quiet and in noise.

And, again, obviously that direct connectivity to the audio from the TV directly to your sound processor. So it saw more than a 20 percentage point improvement for sentences and noise obtained, using that device. So that's really a summary of Connect Your Way. Again, Made for iPhone Smart App, the Nucleus Smart App, our True Wireless accessory and our remotes. And I just briefly wanna touch on legacy sound processors. We covered compatibility of our Nucleus 7 and Kanso Sound

Processors, but this is really kind of a bi-level look at the history of sound processors, starting in 1982 with our WSP, wearable speech processor. Again, every few years coming out with the next generation and really, you know, seeing some key advancements in 1998 with the ESPIRIT. And then in 2001 with the ESPIRIT 22. And you can see, kind of as we move forward, with our BTE and then, again, in 2016, we launched the Kanso as our first off-the-ear and the Nucleus 7. Kanso and Nucleus 7, dating back all the way to our CI24M implants, and the Nucleus 6 being compatible with our N22 devices, implant devices. Of course, we continued to work on backwards compatibility as our goal, to ensure that the latest Nucleus 7 Sound Processor will be compatible with all implant generations in the future. So Nucleus 6, just a quick overview on that, was introduced in 2013.

We did incorporate True Wireless technology and introduced SmartSound iQ with SCAN, which we've mentioned a couple of times today. It was our first cochlear implant with data logging, and I think data logging capability, again, being on the market since 2013, is a really important clinician tool to make sure that we are providing the best hearing care for our recipients. It was the first time we introduced Aqua+ and, again, I mentioned it's compatible with 500 series, 24E, 24R, 24M NB, and 22, our first ever implant generation. So really helping candidates to choose. We have two great sound processors in the Nucleus 7 and the Kanso. And we offer you tools to ensure that you and your recipients, and your candidates, understand the differences between Nucleus 7 and Kanso. So, you know, obviously we did mention today that there's a True Wireless capability for both. SmartSound iQ, dual microphones, FM connectivity. We have remote controls and features for controlling those devices. Disposable options for those devices. But you can see some of those differences. So with the Nucleus 7, of course, we're adding the Made for iPhone connectivity and we're also, another key aspect, is the rechargeable battery option. With Nucleus Kanso, it's really focused on simplicity and getting the processor off the air without sacrificing any of those performance aspects. And so this is a great way to approach

both processors and to ensure that we are speaking with each candidate specifically, and understanding what fits best for them. As far as Hear Your Way, you know, tying back to that, within initial system kit recipients receive the processor of their choice. The battery options, they get four accessory choices. So of all the True Wireless accessories we've covered, some of the retention options, they get four choices included and then, of course, some complementary items that ensure that our recipients are hearing and have access to hearing throughout the day. We do offer a Plus One certificate, so we know choosing for accessories, at the point of their initial order, a recipient may not know exactly what they want. And if they are having difficulty kind of honing that down and really wanting to have more experience with the device before choosing, we do allow them to choose a Plus One option. So, essentially, they would pick three accessories. They would get a voucher to allow them to choose a fourth accessory, sometime within a year from their initial order. Warranty, Cochlear does offer a five year warranty on our sound processors.

Here you can see the outline of the different components that are covered. Sound processors, coils, magnets. Speaker units for hybrid. Our remote controls and remote assistance that are offered with our devices as well as the battery covers and the battery holder for disposable configuration. One year is our True Wireless accessories, our Aqua+ coil and cable chargers. The N rechargeable batteries all have a one year warranty and all of their accessories that aren't listed are 90 days. So I wanna leave you with a couple of clinician-focused aspects. One is, we do offer a wireless programming pod. So really just connecting the wires. Allowing pediatric recipients, who are being programmed, to move freely about without having to be connected or tethered to a laptop. And so this is something we introduced with Nucleus 7 and really improves that fitting experience in helping you to interact with your recipients. We also offer Cochlear Link, which is a secure service. It enables automatic device registration and enhanced service and support for your patients. So essentially, what Cochlear Link allows us to do is not only improve patient care but also save you clinician time and, of

course, money. Basically Cochlear Link allows for auto registration, which is a key aspect, right. So connect the device and it automatically registers. It also allows for us to have access to that patient's program that's stored in the Cloud. So essentially that recipient will call us if they have a device that needs a repair. We will work directly with them and when we send them out, at their device, we can actually download their program directly from the Cloud, put it on the processor, and send it directly back to the recipient. And what you didn't hear in that example was clinician intervention. And so, again, that's going back to us working directly with our recipients, giving them apps, getting them back a sound processor and ensuring that you can spend more time focusing on, you know, obviously your practice and your day to day activity. So really saving you time, saving you money and convenience, in terms of auto registration as well.

So in review, the Nucleus 7 Sound Processor is the smallest and only Made for iPhone cochlear implant sound processor, which delivers proven hearing performance, was included in our SmartSound iQ and SCAN. Dual microphones, et cetera. The Kanso is a smart, simple and discreet off-the-ear sound processor, with no compromising hearing performance from a BTE device. So, again, it's a sound processor portfolio that's tailored to allowing patients to hear and wear their way. And last, Cochlear is a lifetime partner for our recipients and our professionals. So we wanna continue to maximize on service. We wanna continue to ensure we have a strong customer service department that supports you. And we wanna continue to deliver tools like Cochlear Link, that ensure that you are basically maximizing your time and spending your time efficiently, in your practice, and being able, for Cochlear, to take things like auto registration and repairs, into our hands, and working directly with our and your recipients. So I wanna thank you for your time. I appreciate you spending your time and focus on this presentation. Again, I think, you know, taking a few moments to look at our Cochlear Implant Sound Processor Portfolio that includes the Nucleus 7 and the Kanso devices and all the access to great accessories, and wireless options, is

something we want to, again, continue to deliver to our recipients. We do understand, just as you, that a hearing loss is unique and we want to make sure that we cater to patients so they can hear their way, they can wear their way, that they can connect their way. Now we wanna make sure we continue to deliver tools that allow you to carry your way. Things like Cochlear Link and wireless programming sessions, and you're continuing to advance this industry. So thank you, again, for your time, and if you have more questions, again, feel free to visit our web.