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Genesis AI: Beyond IP68

Presenter: Michele Hurley, AuD, FAAA

- Hello everybody and welcome to Genesis AI: Beyond IP68. My name is Dr. Michele Hurley and I'm a Senior Education Training Audiologist with Starkey, and I'm looking forward to sharing the details about how we have maximized the durability and performance of the Genesis AI product line. But before we get started with that, I'd like to cover a couple of housekeeping notes. If you do have some questions, please type those into the Q&A and click send and I'll be able to respond to those throughout the course of our session. If you're looking for the handout that goes along with this course, a PDF is accessible through your pending courses on Audiology Online, and also by clicking on the link in the chat area here within the classroom.

The EUs are available as long as you have a paid Audiology Online unlimited CEU Access membership. After you complete the course, you can go to your pending courses on Audiology Online and you'll look to pass the multiple choice exam that is available there. If you are having any technical difficulty throughout the course of the session, please call Audiology Online at 800-753-2160, and you may wish to jot that number down so you have access to it just in case. Or you can also email customerexperience@continued.com or use the Q&A window as well for any, you know, technical challenges that you may experience during our time together. My goal for you as a result of attending this course today is to be able to describe the design and the manufacturing process that provides maximum durability for Starkey's Genesis AI product family, be able to list the testing that Starkey products undergo, and to list the quality control measures that Starkey products are put through.

So let's go ahead and get started and talk about all of this. I'm pleased to be able to share the details about how we have taken the Genesis AI product family beyond that IP rating of 68, which we know is our, you know, goal from an industry standard. So, you know, when we think about developing technologies and Genesis AI is a product family that we actually have been working on for over five years prior to its launch last April. You know, our objective really was to design technology that was going to be,

you know, perfect on day one and work as well on day 1001 as it did when the product was first dispensed. So, you know, we put a lot of effort into that design, you know, from the ground up with Genesis AI, we were working with an entirely new platform, new software, new app.

And so, you know, we really put a laser focus on addressing maybe what was perceived as some weak spots in our legacy designs, and processing process as well. We think about building, you know, we're looking at, you know, how we've invested heavily in ensuring that we have automation in manufacturing processes that are gonna help us to be able to build the technology right the very first time. And once we do that, we test and retest so that we can ensure that if we discover that there's any issues as we are building these products, we are going to be able to go back and resolve that before the final product is ready to be launched. And really our goal with this entire process is because we want to delight both the professional that's going to be fitting the products as well as the patient that is ultimately going to be wearing them.

And it all really starts from the design prospect of, you know, just really sort of identifying what it is that, you know, the patient and the professional are looking for in terms of a product. So it's kind of interesting to see some of the, you know, the designs and the mock ups that are part of this process as we ultimately, you know, come to having something that is a little bit more kind of structured and ultimately is able to be developed as a prototype. So it's really interesting, I think, to see kind of the back process that goes along in creating these hearing aids. We think about just what the definition of product design really is.

It's to be able to, you know, imagine to create and ultimately iterate a product that is going to resolve a user's problems or address a specific need that they may have in whatever given market, you know, we're talking about. And it's really that ability to be able to create, you know, something that, you know, we can compare against an ideal,

you know, if you think about donuts and, you know, if you've bought a Krispy Kreme donut, you know, you may be imagining it and comparing it against what you know a Dunkin' Donut to be and you know, does it stand up to that comparison? You know, we wanna compare with like things, and so that's what we're looking at as we develop this product and we think about comparing it with other hearing aids that are part of our marketplace.

When we think about being patient centric, it's all ultimately about the patient because they're going to be the ones that are gonna be using these devices day in and day out. And so we need to make sure that this individual is going to be comfortable with how this product fits on their ear, you know, the product itself in terms of the performance. So, you know, all of that really needs to be focused on what that patient is looking at when we think about hearing aids, because that's really, you know, the end goal. And that's why we at Starkey come to work is to ensure that your patients are going to have a product that is going to meet their needs and create that true delight in their hearing experience.

We think about something that meets the customer's needs, you know, we need to take a look at several different factors. You know, obviously appearance is always very important. We think about, you know, technology, we want it to look good and not look clunky, but you know, ultimately it's going to be the function of it that is going to be the driving force, you know, is it going to do what that individual's wanting it to do and, you know, are we going to be able to manufacture it and to do that repeatedly with the same kind of outcome. And, you know, I think it's kind of interesting to think about these three elements. You know, when we think about coffee and, you know, if we look at this image here, it's a beautiful cup of coffee or latte.

It's got, you know, that lovely latte art, you know, and that cup design is really nice. But, you know, when we think about that functionality, you know, that type of cup is

great in the moment, probably not necessarily as heat retentive as some other types of designs, and it's not very portable. So depending on, you know, what your objective is with this cup of coffee, this may not meet that need, you know, on an ongoing basis. So I think it's kind of interesting to think about it in terms of products that maybe we use on a daily basis. We look at the way that Starkey is, you know, laying out this process, you know, first it starts with understanding what both patient and professional are really looking for when it comes to a design of a hearing aid and clearly defining what those components and what that, you know, that needs to be as a deliverable.

We go into that idea phase trying to identify, you know, some creative ideas on how we can do something differently than maybe it's been done previously in the industry. And then ultimately create a prototype that we can review, implement as a, you know, test product and be able to test and learn from that and then start this process all over again. So it's a very circular process until we ultimately come to that final design of that product that is going to be launched to the market. I think it's really interesting to think about hearing aids today, and especially in comparison to when I started in the profession. You know, the style of these devices has changed quite dramatically and what is even more dramatic is the functionality and performance of these products and what they're capable of doing.

And, you know, when you really think about hearing aids, obviously we're trying to keep them small, but yet perform, you know, a lot of various functions that have changed, especially as we think about digital technology and, you know, engaging with smart devices. So we've got a lot of little tiny components that need to fit in a very small space, and we need to be very exact and very measured about where all of those pieces go to ultimately deliver a product that is going to be worn and working all the time and yet aesthetically pleasing. One of the key challenges, you know, we've, you know, thought about hearing aids over the years has been battery performance and

you know, we know the patients are always very concerned about getting the most possible out of those batteries.

And what we use in hearing aids, you know, we need to keep it small, but yet it needs to be able to deliver a lot of performance day in and day out. So, you know, this is something that, you know, we as an industry have really been, you know, working towards for many years and especially as we've gotten into rechargeability that, you know, really has kind of changed, you know, with what we are able to do. And I know when I first started in the industry there were no rechargeable hearing aids to speak of because of the size of the unit that it would take to be able to accomplish all of that. So I think it's really amazing to think about what we're able to do in today's world with these devices and make sure that they can last all day on that rechargeable device.

You know, with Starkey it starts with that battery technology and you know, the processor and what we wanted to be able to do with that to be able to accomplish our end goal. And so, you know, to be able to offer the kind of battery life that we're capable of with Genesis AI, with our flagship RIC RT being able to offer 51 hours on a single charge, you know, our engineering team and our scientists and our designers all got together to try and figure out what the best way to do this was. And we wanted to minimize the power draw on our processor and be able to maximize the capacity of that battery to be able to deliver that long life.

And we were able to do that quite effectively. A really good analogy I think of this is thinking about a car. You know, we want our cars to be as efficient as possible and yet have that same power in a really nice size that appeals to our needs. So that's kind of a good way to really think about what we were able to accomplish with both the processor and the battery capacity working together to deliver that maximum battery performance. So, you know, again, looking at the capability that the Genesis AI product family has, that RIC RT with 51 hours on a single charge, and that really lengthy battery

life is continued through the other rechargeable devices, including custom, and even extra performance on a zinc air battery than maybe could be imagined even, you know, a generation ago with technology.

Another factor that, you know, we need to test and evaluate with these products is wireless connectivity. And of course this is a whole new world, you know, for us in the last several years with hearing instruments and we know that our patients are expecting high performance and, you know, good robust connectivity all the time. So we need to be able to deliver that and, you know, make sure that the products are able to communicate with everything that's out there and not only our family accessories, but also that other Bluetooth devices that are going to be, you know, connected to the hearing aids. One of the factors that we, you know, often I think can forget about when we think about that connectivity is the impact that our body has and our body is actually primarily made up of water.

And, you know, this test case allows us to kind of see the impact of that shadow of that, you know, the head and, you know, the water that we are made of and you know, how we have to work to ensure that we can have that good for the signal all the way around when we're having to kind of overcome some of those obstacles that are in our own bodies. When we think about, you know, designing from a quality perspective, that really is a key factor. You know, if I were to ask you what product quality is, very often the way we respond to that question is about what product quality isn't. We're thinking about, you know, examples of something that is not good quality, you know, thinking about, you know, your phone and how easy it is to damage those or, you know, getting the wrong order when you go to the coffee shop or you know, all of those things that you know are quality that we really look at from the perspective of not being so quality.

You know, and when you think about it in that way, it creates a poor user experience and that's what we're really striving to, you know, overcome what these products. We think about quality, it's that standard of something as measured against other things that are similar, and it's that real degree of excellence of something. You know, again, kind of using that example, you know, from the Krispy Kreme and the Dunkin' Donuts and comparing those, you know, you may rate one as a higher quality than the other, and you can do that because they're equitable products. And so, you know, how you determine which one is higher quality in your estimation may come down to what we really think of as three rules of quality.

We're gonna talk about each of these, the quality of promise, of exclusivity and of effort. So as we expand on the quality of promise, when we think about, you know, hearing technology, does it meet the specs and the regulations that, you know, we as an industry need to uphold? And, you know, we know that that's something that we have to strive for with hearing technology. You know, is the product gonna hold up over time? You know, we know hearing aids are intended to last more than several years, and is that product gonna be dependable and worn and working on a daily basis as we think about that promise that we're making, not only to you as the professional, but also your patients, of that performance for the life of the hearing instrument.

So, you know, ultimately we're trying to look to see, is the product gonna say do what we say it's gonna do. We think about exclusivity, you know, this is something that, you know, is that product look giving you that premium feel? You know, does the packaging look like it is a made of high quality, and is this something that's pretty exclusive that you couldn't necessarily get anywhere else? You know, when we think about luxury brands like Louis Vuitton, you know, Mercedes for example, you know, we know that they're not just, you know, things that you can find readily and easily. They have a different level of exclusivity in terms of obtaining these products both from a access and a cost point.

So, you know, definitely something that we can think about when we're thinking about hearing aids. Does it give you that deluxe experience that you are anticipating based on what you're paying for that product. Ultimately the quality of effort, you know, we need to make sure that we as a manufacturer, are easy for you to be able to place an order and if you have an issue to be able to have that resolved or ultimately to be able to return the product. And so, you know, that's something that is very important to us to make sure that we are accessible and you know, able to communicate with you to discuss any issues that you may be having.

And I think that's something that Starkey really focuses on. And a great example of that is the fact that, you know, when you do call in to us, your call is answered by a live voice and with a conservative estimate of getting to your intended destination in less than 30 seconds. So, you know, it's important to think about, you know, if something does go wrong, what is that vendor going to do to make it right? And that's something that Starkey really values in delivering for our customers. When we think about, you know, the ear, you know, this is a really challenging space to work in. It can be really classified as a very hostile type of environment.

When we think about electronics being introduced in this space, you know, it's warm, it can be moist, you know, you can deal not only with moisture in the ear, but also over the ear and, you know, just a lot of challenges that technology has to deal with. And we need to make sure that those devices are going to be able to, you know, work successfully in this very hostile environment for many years to come. And the way we've really designed that to be, you know, even more durable than we've ever been in the past, is by developing a process that we call Pro8 HydraShield that is key with our Genesis AI product family. This is eight points of protection that look at various aspects of the technology and ensuring that there is layer upon layer of protection for this product.

We've got a completely closed lithium ion battery, Kevlar reinforced receiver cabling, you know, the reduction of seams and layers and layers of protection that are designed to, you know, something gets past the first layer, it's going to be captured by one of those other layers that is below the surface of these technologies. And it's something that is really working incredibly well for us with the Genesis AI product, and we're gonna see some examples of that here in just a second. One of the things we are really proud of at Starkey is that all five of the rechargeable styles, both RIC and custom in the Genesis AI product family are waterproof, and we can verify that to a meter and a half in terms of depth and 30 minutes of time to be exposed to that kind of moisture.

Now, you know, just because you could go for a swim with the product and, you know, not have the water cause it to malfunction, doesn't necessarily mean that you should. And that's more from a, you know, loss perspective with technologies, you know, such as hearing aids. If you're gonna go dive in the pool or the ocean, it's much more likely that the hearing aid is going to come off and get misplaced than in the case of the Genesis AI technologies actually have a malfunction as a result of that water. So as we think about, you know, our industry standard of that IP rating of 68 with 6 being that focus on dust and debris, 8 being that focus on, you know, moisture and being protected from that, we wanted to really see if we could go beyond that with our design process and our ultimate testing process for this product family.

So, you know, when it comes to the quality, you know that you want your products to be reliable and that's probably a big part of your decision making when it comes to the manufacturing that you choose to work with. So what I'm gonna do right now is kind of give you a peek behind the curtain of how we are managing the performance and reliability testing for our technologies, especially Genesis AI. When we think about, you know, one of the challenges, you know, very often it's those hearing aids, you know,

falling off of ear, getting dropped on a surface, and you know, the have impact that that impact has on that hearing aid performance when we drop them.

We always, you know, recommend that our patients clean those over a counter or a soft surface, but we know the reality is that isn't always what happens. So what are we, as a manufacturer, doing to protect those devices? Well, we've developed a impact testing and this is an example of what that looks like from the custom perspective where we're dropping that so that we can see what happens as it hits that surface, what points are being impacted, and you know, how we may need to shore that up over the, you know, the design process so that we can make sure that, you know, if and when this does happen, that that custom device is not going to have any sort of cracks and weak points.

So we dropped a lot of custom devices to see what happens. Took a look from this perspective of the RIC products as well. And I think this little, you know, video is kind of interesting because you can kind of see where those hotspots and touchpoints are and what happens as that hearing aid is being, you know, dropped in various positions. So we can see where that impact has an effect on the device. Do we need to do anything to shore that up to make sure that, you know, if and when, again, this product is dropped, we have that protection built in for the long term? With wear and tear, you know, again, these are devices that are, you know, in a hostile environment and they're getting, you know, removed and inserted, you know, hopefully not too many times throughout the course of a day, but we know over the lifespan of the hearing aid that that can definitely have an impact on that product.

So, you know, we wanna make sure that these devices are going to be durable from that perspective. So as we think about, you know, what's part of that process and you know, as we incorporated RICs, you know, an entirely new style of device a number of years ago, you know, we needed to kind of rethink that process because the products

are different than a custom hearing aid. They've got, you know, different pieces in terms of that receiver, the, you know, the coupling that's going in the ear. So we need to take a look at that and we modified our process based on the type of product that has become the biggest seller worldwide. We think about, you know, user controls, we need to make sure that, you know, over the aging process of the use of these devices that they're going to be functioning well.

And so we've developed an aging, you know, standard with this technology to be able to look at them not just for day one, but to be able to age that to that capability over three and five year spans of time so we can ensure that the products are going to be functioning correctly over that length of the life of the hearing instrument. And we can test and test and test with that aging built-in to verify the product is gonna be durable over that time. You know, we know that moisture has long been the biggest challenge in our industry. The hearing aids themselves reside in, you know, a place that can be quite moist. If they're over the ear, then obviously, you know, they're at greater risk for perspiration and moisture from getting caught out in the rain and those types of environments.

So we need to make sure that, you know, these hearing aids are going to be able to live where our people do and you know, be able to, you know, stand strong through all that hearing aids go through. So when we think about, you know, why this has become such a challenge, you know, when we couple this with the miniaturization, that has been a key part of, you know, making sure hearing aids are, you know, aesthetically pleasing and, you know, acceptable for people to wear. You know, we're trying to put a lot of functionality in a really small space and that certainly complicates things for us as a manufacturer. So when we think about, you know, the impact that a little bit of moisture can have in that very small space, doesn't take very much.

And if we kind of look at a representation of what even, you know, a small drop of fog may be versus rain from a light rain or a storm, we can see that, you know, we're talking about microns with the components of the hearing instruments that are in that case itself. It doesn't take a very large drop of moisture to have a really negative impact on those tiny components. I mentioned the testing and kind of over that aging process, you know, we wanted to ensure things like user control, push buttons that are getting pushed repeatedly throughout the day and throughout the life of the device are going to be durable. So we developed a process to be able to test that button, pushing over, you know, a number of times that it might take over that three to five year span and we're doing it in a salt fog environment.

So really creating a hostile test environment to test that user control button function. And I affectionately refer to this as the water torture test. With this, we are actually dropping salted water on those user components and seeing where, if any places, are a weak spot that moisture is getting past, you know, into the instrument itself or is it, you know, having a negative impact on the user control area, again. And the IP rating test that we as an industry know it is submerging a hearing aid in water and that's pure, you know, tap water or pure water. What we at Starkey wanted to do was test that but do it with salinated water and in fact, it's not visual here, but we even do that with the case off the device.

And that's an example of how we're taking this beyond the typical IP68 rating in terms of how our test process to ensure that this product is going to be waterproof and durable for the long term for your patients. Now I grew up in Oklahoma and it's always windy in Oklahoma and so I think of this kind of as the Oklahoma test where we're blowing dust and debris into these devices, so much so that you even lose sight of the device itself. So again, we're testing that, you know, that first piece of that IP68 rating, which is that dust and debris tolerance. Again, thinking about, you know, testing in a less than ideal type of environment, using salinated water to be able to test these

devices as opposed to, you know, more pure water allows us to do something that's going to be more representative of how the patient is going to be using these devices in environments where, you know, there may be perspiration and humidity that, you know, are much more hostile than traditional regular water.

We at Starkey have invested heavily in our automation process and equipment that is designed to allow us to replicate this process that we have developed from one device to the next, to the next, to the next. You know, humans are wonderful and we've got a lot of humans that work for us at Starkey, but we know that, you know, when they're on the line and applying coating and doing things in the manner in which we used to do it not that long ago, that you know, when you get distracted, you get tired, that opens the door up for, you know, missing a spot. And we wanted to really change that process and make it much more automated.

So we've invested very significantly in technology that allows us to do that very well. One of the things you can kind of see displayed here is the fluorescence and that allows us to go back and check our work with this equipment as well. Here's a great example of, you know, what we've done with that fluorescence. It allows us to view the internal coating and to make sure that there's not any, you know, spots that have been missed or you know, any areas that are going to possibly be a weak point for that hearing aid wearer. To kind of give you an example of what Pro8 HydraShield has meant for our Genesis AI technology. So on the left you see a circuit panel that was covered with our traditional nano coating that we've been using for the last number of years.

And you can see that there with some moisture being applied, there was a little bit of a bleed through and some corrosion that's actually taking place there. But, what you see on the right is that circuit board with Pro8 HydraShield applied and when the moisture was applied. So these were, you know, used in the same type of condition and

situation, how pristine that circuit is and those components are all, you know, perfectly protected. Another example of that comparison of the nano coating and how when that moisture drops, you know, hit that on the left, it created some bleed through. And what that means for the patient, ultimately, is the potential for some shortage or, you know, breakdown of the performance of the devices.

On the right, we see the same conditions with Pro8 HydraShield being applied and that everything's kind of staying where it's supposed to be. That sort of silver type of coating is all where it needs to be on those tiny, tiny little components. This is really the brains of the battery of the technology and you can see on the image on the left that that moisture was able to get past that and we've got some corrosion and some, you know, damage that's occurred there, but on the right, in the same conditions with Pro8 HydraShield, we're able to keep that clean and functioning and that means that the brain of the device is going to be working very well.

Another example of, you know, again, devices that have been submitted to the same process in terms of moisture and debris, but the difference between what we had been doing for several years and where we have come with Pro8 HydraShield in terms of protecting these devices. Our new conformal coating process has allowed us really to elevate the performance of Genesis AI. And you may look at this and if you're familiar with Starkey, realize that this is not the new receiver coupling that we have with Genesis AI, which is more of a tenpin type of connection. You know, what we had to do to go back to actually demonstrate the difference between our previous coating and Pro8 HydraShield was apply it to our previous SnapFit Receiver.

You know, we've not thus far really been able to make our Genesis AI SnapFit 2.0 receivers fail because of the Kevlar reinforcement of the Pro8 HydraShield and the conformal coating updates that are part of that process. So you can see the impact that Pro8 HydraShield has had, even when we go back and apply it to our previous

receiver technology. I think it's really nice to see that, you know, Starkey has invested tremendously in, you know, making sure that the design of the product meets the patient's needs and that it's both aesthetically pleasing and built to be durable. As we build that we're, you know, building processes to be able to test these products out to ensure that they are going to deliver the kind of performance all day, every day for the life of the hearing instrument.

And again, that's because our objective is the delight of your patients. We know that, you know, certainly delights you when you don't have to deal with challenges and repair issues with the products. And we know that that's utmost important for your patients to have a device that they can wear every day for the life of the hearing aids. With Starkey, the care and the attention that we are putting into this process from, you know, as it begins as a design to it leaves the factory to be delivered by you to your patients, is something that I think really sets us apart as a company. We are wanting to make sure that we're creating a high quality experience for you and your patients.

I wanna thank you so much for your time today and I look forward to seeing you at again at a Starkey event in the future.