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Understanding Envision's Features and Effectively Positioning Them for Patient Success

Presenter: Chris Phoenix

And welcome everyone to Beltone Envision Understanding features and effective positioning. We are so pleased to welcome one of my very favorite people, Chris Phoenix. And Chris, I'll turn things over to you. Thanks Kimberly. I can't tell you how much we appreciate you guys taking the time to meet with us today.

And I really want to shout out to Kimberly Rojas, the greatest host ever. I love working with Audiology online because of people like Kimberly. So thank you for always making it fun and easy and supporting us in this. Welcome everybody. You've hopefully been able to watch some of the other great presentations this week from Kathy and Laura discussing some of the technology aspects of the new envisioning.

Commence product Today we're going to talk a little bit more about the features and how to use them in a way that's going to help us separate out for our patients so our learning outcomes. Today we're going to talk about the concept of a deep neural network and try to figure out how to explain it in patient friendly language. We want to be able to differentiate between Sound Cleaner Pro Clear Focus, True Noise Reduction. We want to explain how Moving from a 176364 to a 1762 S micro will improve a patient experience. We want to talk about the various features in the different technology levels of the envision and help you develop language that's easy for patients to understand while trying to describe it for them.

And then at the end we want to talk about identifying possible concerns that might come up and then talk about some language that we can use to handle those concerns when we do come up. Now, as with any other presentation, there are some risks and limitations that we like to put in there. Thank you to the lawyers who have both required this and causes in there. But if you are curious or would like to know more about the risks or limitations, you can go to the repository and pull up the slide deck and you'll be able to read those there.

Now we want to start with talking a little bit about artificial intelligence and deep neural networks. And the first thing I really like to stress is that artificial intelligence is not new to Bell to. In fact, we've been using various forms of it for more than 15 years. Our first and most prominent place that we use audio artificial intelligence is in our Environmental Classifier. This is a system that we've been using for years which picks up various aspects of the sound environment around us and then it classifies that sound into seven distinct environments.

Currently we use quiet, soft speech, loud speech, speech in the presence of moderate noise, speech in the presence of loud noise, then just moderate noise and just loud noise. And by separating it into those seven distinct environments, we are then able to utilize other systems like our Smart Game Pro and the per environment sound cleaner to again, modify various aspects of the sound amplification for our patients and their benefit. Another huge artificial intelligence system that we've been using for years is our cross link directionality systems. We are actually, remember, on our fourth and ultimately now a fifth version of that. Again, that's 13 years we've been using that various form of adaptive directionality.

And that adaptive directionality is based on inputs that the hearing aid receives and then applying an artificial intelligence system to determine what we should be doing with our directionality. So this is something that we want to both embrace and recognize and be able to effectively communicate to our patients that this is not new. We just like to have a lot of hype around it today. So at the end of the day, what exactly is machine learning, artificial intelligence, or a deep neural network? In its most basic form, AI is simply a series of if then propositions.

That's it. If you detect X, then you do Y. In the most basic form of this process, we have simple rules that are straight linear, meaning that it can only do one or two processes as a result of an input. This would be something like if the detected volume exceeds 100 decibels, stop increasing the gain, or if the sound input falls above 3,500 kilohertz, maybe we're going to reduce the output to a different

frequency. Now, as computers got more complex, we were able to do more and more of these linear processes simultaneously.

In the early days, we were doing 10, 100, 1000 or so different processes every second. Now we were looking at the point where we're doing over a million processes per second, which is pretty incredible. But the real leap happened, and ultimately it was in the late 80s that engineers came up with the concept of really maxing out the capabilities of these chips. When you can no longer grow anymore in a linear processing system. What they decided to do was kind of mimic what the human brain does.

And what we do is we use a system that, instead of going in a straight linear fashion, would send the if portion of the IFM procedure to several different nodes or several different places to process it all at the same time. These nodes would each try a different option of an outcome, and they would do it all at the same time. And then they would measure those outcomes to see which one worked best. So then it would take all the things that it didn't like the outcomes on, and it would ditch those and it would try a whole other series again. Each time, it refines the outcome a little bit at a time.

This is what we often refer to as being smart because it learns from the outcome. Now, at the end of the day, does this mean that the system is thinking? Well, no, not at all. It just means that it's trying out lots and lots and lots of options really, really fast. End of the day.

The thing about AI and machine learning deep neural networks is that they cannot think creatively. Really all it can do is use what it's fed to come up with different options that it can try.

Now, how do we take this concept and then apply it directly to a hearing aid? Well, it all comes down to teaching the system what constitutes a bothersome noise and what does not. So, like, an example of a bothersome noise would be something like dishes clattering or trains passing or traffic, maybe cutlery playing way on flat plates. Now, some of you might be thinking, well, bothersome noise is probably

something like my gradient marble or maybe your little brother. But no, it's not that.

At the end of the day, once the system has been fed enough different examples of clear speech and then also speech and presence and noise, it can learn to differentiate between the two and it's important to know that this learning is not happening in the hearing. It's not happening on the DNN chip. Instead, it happened in a huge server farm with massive processing power over several years. The thing we were trying to do then was to create a model in which we were able to differentiate this. And once that denoising model was developed, it's really easy for us to just then apply the knowledge using a very small chip that uses a minimal amount of power, and then we can put that in with our hearing.

So we end up burning that process that we've learned and developed through that deep neural network into the chip in the hearing and pair it then with our 360 chip. So when we activate the two together, the system between the DNN chip and that 360 chip then, quote unquote, removes the noise from the equation at a level that the hearing speech will come through much, much easier. It's really a simple concept. We taught it to recognize noise, and then we taught it to ignore that noise when it amplifies the sound that it hears. It's, it's simple and actually really, really cool.

What I want you guys to think about when you're explaining it to the patient again is to help them to understand that this is not a system that's happening on the hearing aids themselves. It's happening in these massive server farms. Over many years, they develop the system that we use to then run that dmm. Now, in the envisioned hearing aids, we've introduced several new terms that could be kind of confusing to understand, keep track of. So let's talk a little bit more about things like sound cleaner, clear focus, true focus, and true noise reduction.

And before I do that, I do want to clarify some language that sometimes we use incorrectly when we manipulate incoming noise. At the end of the day, we're not eliminating it, we're not removing it, we're not really getting rid of it. What we are in fact doing is simply not amplifying that sound to the same level

that we amplify the speech sound. Now, I get it, for some of you, you're going to say that's really pedantic. But it's important for us to keep in the back of our minds because at the end of the day, we can't take away what's really there.

What we can do is just not add that noise into the soundscape we're providing for the patient. Again, it's not necessarily a conversation that we have to have with our patients, but it is something that we need to understand, keep in our minds, in the background. So let's talk a little bit about these various denoising solutions. And this is something that we want to talk about more and more. Excuse me, and language that we want to use more and more.

And that's denoising. It's a very effective way to describe what we're doing in a legitimate and an honest way. So the first system we use for that is the Sound Cleaner Pro. Now, Sound Cleaner Pro is our tried and true system for reducing the amplification of background noise. The system that we've been using for over a decade.

It uses a really simple form of machine learning, or AI even to recognize patterns in the sound that are likely to be noise based. Based off the frequency, the modulation and the intensity of those sounds. It's about as effective a system as you could get prior to this, especially in a linear processing manner. But at the end of the day, it's kind of like trying to catch fish using a net with really big holes. You don't catch any of the big fish, no problem, but the holes are so big, all the fine stuff, the little fish just swim right through it.

And with the noise aspect, that can still muddy things up a bit. Now Sound Cleaner Pro. It's available on levels ranging from off to mild. And Mild is going to filter around 2dB of noise. We have moderate net filters around 4 considerable, which is going to be between 7 and 8 and strong, which will filter out as much as 10 decibels.

Now, in the 17 series previously and in some of our current models as well, we also have that per environment setting which allows us to set different levels of noise reduction to different environments using that environmental classifier to decide when to turn it on and off. A Sound Cleaner Pro currently is the environmental noise reduction system used in the all around program of the envision 1762 micro as well as in the all around and Hearing Noise programs of the 1763 and 64 models. And it's also used as the Hearing Noise program in all of the other Delta Vision models and levels as well. Now, Sound Cleaner was what we've been using consistently for years. The next one that we introduced was our Clear Focus.

Now keep in mind that Clear Focus is not actually an environmental noise reduction program. Instead, it's the name that we give to that modified full low frequency bandwidth split band directional system. That's a mouthful. And that's what we're using in the 1763 and 64 models. Really, to simplify it, keep in mind that this is the upgraded version of the Ultra Focus 2.

And what we did is we were able to increase the directional benefit by an additional 1 to 2 decibels from that 8.6. We're at 9.6 to even 10 and a half or 11 decibels of speech noise improvement based off of this new directional system.

But that Clear Focus is again going to be used in the 1763 and 64 models. Now the next one that we use is going to be our True Focus. And True Focus is very similar to the Clear. Well, basically it's the same as the Clear Focus, except that we're using it in The Belton Envision 1762 S micro RA stock. So what it's doing is again, it's using that full low frequency bandwidth directionality in the Hearing Noise program to increase that directional benefit from 8.6 to 9.6 to 10.6 or 10.5 ish in the ultra Focus.

So it's replacing the Ultra Focus here. Now, if the Clear Focus and the True Focus are not environmental noise management tools, why did I bring them up? So I brought them up simply because they partner with the Sound Cleaner. And then it also partners with our True noise reduction system to

end up giving Our patients a clearer and more comfortable listening experience when we're dealing with noise. And because they are denoising tools.

So while it's not in noise reduction tool is a denoising tool.

So we started the conversation based around AI and deep neural networks. So this is where we get to apply it. We, we're going to talk a little bit about how we use it with the true noise reduction. So when we take our true focus, which is what we just talked about, it's that adapted directional noise reduction system. And then we pair that with the deep neural network chip that we train to recognize and reduce the amplification of everyday noise without reducing speech.

Then we get that next level listening. So we train that chip on hundreds of millions of sentences. It has an incredible ability to say that's dishware clanging, we need to cut that back. Or that's a motorcycle driving down the road, we need to reduce it some. Or more importantly, that's my first granddaughter singing the theme song or favorite cartoon.

That's not noise. We want to amplify that. So that true noise reduction is that fantastic combination of really, really crazy effective directionality and the AI powered noise reduction system which is going to provide a hearing and noise experience that really focuses on what's most important for our patients. At the end of the day, that's hearing the noise.

Now the Belton Envision is really, it's, it's incredibly groundbreaking in a lot of ways and it really shows us that the 62 micro RA is the big showstopper. We talked about that DNN based noise reduction and just how important it is to really take that noise out of the equation for the patient. But it's also critical for us to remember that it's only available in that 62s and it's not in the 63 or 64 models. Now there are a lot of reasons why some of our patients want to stick with traditional air zinc battery powered devices. I've talked about my friend Brent before.

He's a phenomenal patient and friend who's also a backcountry guide. And he's often in the backwoods of Idaho for days or even weeks at a time. For him, there's no really easy way to charge his devices when in the middle of nowhere. And for him, rechargeable is just not, it's just no go. It's not an option that works for him.

I have a couple other patients I care for that are really big world travelers and what they hate dealing with more than anything when they Travel with stupid adapters for every different country and every power source. And especially when it comes to their hearing aids, because you can buy an air zinc battery anywhere in the world. However, airsinc batteries can't hold up to running a BNM chip. The voltage just isn't consistent. And we've all experienced that, right?

You put a brand new battery in and day one, it's nice and strong, but by day three, day four, that power starts to diminish. Well, that doesn't work when it comes to hearing aid or, or running a deep neural network. And so for this reason, we really need that consistent power that's only available to us using a lithium ion rechargeable battery. So that limits us that 62 for our, for our DNA. Now, don't let this suggest the 63 and 64 versions are not phenomenal products.

They are phenomenal. They are an upgrade over what we've had in the past. They're better than the screens with that new clear focus. It's fantastic. It's a huge step forward in noise management and a big win for those people who are hesitant to adopt the rechargeable a.

When it comes down to it, the focus and the key point for us between a 62 or 63, 64 is going to be that the air zinc will allow for clear focus directionality, which again is an upgrade to Focus 2. But that rechargeable 62S provides us not just the true here true focus, but also the true noise reduction, which is that combination of the DNN imagery focus together. And so if our patients aren't adamant about not having rechargeable stick to that 62, it's going to make a huge difference.

So how do we talk about it? This is one of those things that many of you have heard me talking about for years. When we talk to our patients about the power of our products, we want to geek out on that technology. It's fun for me to listen to new providers especially who are just so giddy about all this incredible new capabilities because really, it's amazing. Think about it.

We train our devices on like 16, quadrillion sound and perform 10 billion gazillion processes every day. We know our hearing aids are so amazing, they're going to lower the sea levels, cure cancer, and make the perfect grilled cheese sandwich. Or not. For the record, no, it does not do those things. But the problem is ultimately, at the end of the day, we get excited about it, but our patients don't care.

They don't care at all what they care about is understanding their family and their friends. If they really wanted to understand AI and deep neural networks, they don't need you to tell them. All they would do is do what the rest of the civilized society does. They go to YouTube and watch a video. What they want from you is to know that the hearing aids are going to take away their pain.

And so to help them to understand this, you have to remember to keep it simple. Something like our new Beltone and Vision hearing aids use the latest in AI learning to help you with the bowling out by filtering out lots of that annoying background noise and allowing you to better hear your team heckling your competition. Or something like by using a deep neural network, our new belt on Envision hearing aids are going to be able to help you better understand the dialogue at that dinner theater you love so much, despite all the people around you scraping their plates like you would. Both of those statements are really, really simple. They focus on specific pain points of the patient.

And the recommendation was not about the hearing aids. It shouldn't be about the hearing aids. It should be about the patient. And for those patients that do want to know a bit more about the system, the same rules ultimately should apply. Something like, I love that you're interested in new technology,

Sam.

I totally geeked out on myself the way it works that the hearing aids take in the sound of the pool hom around you, they analyze the incoming sounds and then they separate those sounds into relevant, like your girlfriend calling her next shot and entirely irrelevant, like the sound of the balls clacking around the table. It's then going to amplify the sounds like your girlfriend at a higher level than it does the noise, making it easier for you to hear. Simple, accurate, but specific to the patient and their life. That's it. That's how it should be.

So then, at the end of the day, how would I describe it for each of the different levels of technology? If you were going to do it, I would say something like, well, the belt on Envision 4 uses systems called Crosslink Directionality 2 to narrow the focus of the hearing aids in Sound Cleaner Pro to better help you to hear your friends at the golf course. Right. Simple and easy. Or the bell tone and vision 6 uses a system called crossing directionality 3 to really narrow the focus of the hearing aids and Sound Cleaner Pro to better help you hear your friends at the golf course.

For Beltona Vision 9 uses systems called Crosslink Directionality 4 to narrow the focus of the hearing aids and Sound Cleaner Pro to Better help you hear your friends at the golf course. Or The Beltona Vision 17 uses this incredible system called true focus to narrow the focus of the hearing aids and true noise reduction. Better help you hear your friends at the golf course while still being grounded in the environment. Did you notice that they were all basically the same thing? They were simple, they were focused on the patient and not on the technology.

And that's the key. Now this is also a really great opportunity to remind you guys that even in our lower end models like the four, the six to nine, we have some incredible upgrades that we've done on this to really impact your patients benefits. Right? We've, we've given you better noise, impulse noise reduction, silencer, we've given you more capabilities on sound shift than others features to make even

those lower end products really give our patients the benefit that they need. And then keep in mind that the hearing noise program in the 62s will no longer be using the, the mixing point frequency or impulse noise reduction because those features are specifically built into the true focus system.

Less for us to have to manage, which is fantastic, but still all the benefits. So at the end of the day, when it comes to these different technologies, we put together something like this for you. Last year, in response to ongoing requests for a clear, easy way to differentiate between our products, Dr. Laura ShockTalk created a denoising comparison chart for us and we've updated it here for you to be able to really help the patients understand the impact of higher level products in terms of denoising. And it reads kind of like this.

In the 17 we have true focus directionality which provides 9 to 10 decibels of directional benefit. When we add in our true noise reducing true noise reduction on a strong level, we're getting another nine to 15 decibels of denoising, which gives us a total denoising level of 18-25db. Groundbreaking and industry lead. And as we break down each of the models, you can see those same numbers. And remember, when you compare your hearing aids and the models to your patients, always start at the top to give them the best option available and then show them what they have to sacrifice by pulling the price down.

And don't be afraid to emphasize when patients have a budget, we understand budgets, if their budget is in the four level, fantastic. We're still going to give them amazing help and they're still getting five to seven decibels of denoising, which is a huge, huge advantage for them. All right, so what could go wrong? As with Any new technology, there are going to be challenges that we really have to be prepared for. True noise reduction is groundbreaking, but it's still not magic.

Will your patients still hear annoying noise? Yes. Will some situations still be extremely challenging or even impossible for them to hear in? Of course we want to be really careful not to fall into that trap of

overselling or over promising. We need to make sure we're using words like some, much, a lot instead of all, most or majority.

The aids are going to help in noise, they're not going to eliminate noise.

And that's why we talked earlier about the aids not amplifying the noise to the same level as the speed, instead of removing or eliminating. And along those same lines, always remember the number one reason for patients giving up on hearing Germany in the first place and returning their new hearing aids is because we over promise and we under delivered, set expectations appropriately and even hedge a little bit so that you know, you can give the patients what they want and over perform for them. The next one is if you want to be able to get the most out of your hearing aids for the patient benefit, make the time to learn the nuances. Everybody's heard me preach about this for years. You have to know your product forward, backward, inside and outside.

If the true noise reduction is underapplied, the patients aren't getting the benefit they paid for, and conversely, if it's overused, you can create all kinds of additional problems for the patient. You really have to know your product and how to fit it properly, know those nuances, know the little things about them. That's what's going to make us great at what we do. And then last of all, don't be surprised if patients are scared by this new technology. There is a lot of fear mongering these days about AI and it's taking over the world.

I've been reading science fiction novels predicting this for decades. So when it comes up, not yet. When it comes up, help your patients to be calm by reminding them of the simple things the hearing aids are not actively learning. The training is done in massive servers that are burned into the chip. It's not recording them, it's not collecting their data to sell on the open market.

It's not eavesdropping on them. It doesn't know what cereal they're eating in the morning. It doesn't know what brand of shampoo they're using. It's not selling that information. All it's doing is simply executing if then functions.

And oftentimes with these older patients, it's really good to be able to use humor, light humor to quell their fear. But don't forget to recognize the validity of that fear and that it comes from simply a place of ignorance or a lack of knowledge. So by helping to educate them and using a little bit of that humor, it's okay. You can help to solve those or mitigate those fears. And then we've got a handful of key takeaway points.

Remember, we've been using AI or machine learning in one form or another for years. The Beltone of Vision True noise reduction is simply the next generation of this true focus clear folks focus are directionality upgrading. It's our Ultra Focus 2 on steroids. The Envision 1762 S Micro has true focus. But when you go to the 63, 64, we only have clear focus when talking to patients about technologies.

Remember, keep it simple. Focus on the specific pain points that are relevant to the patient and make their recommendation about them, not about the devices. This is really critical. And I was thinking about this this morning in the shower because it's that time of the month. I had a shower.

We don't sell hearing aids. We have to get this through our heads. We are medical professionals licensed within our jurisdiction and within our scope of practice in the same way as a heart surgeon does. A heart surgeon doesn't sell pacemakers. A heart surgeon treats heart problems using a pacemaker.

We don't sell hearing aids. We help fix people's hearing loss and we use hearing aids to treat that. That's the tool that we use to treat their hearing loss. When we can wrap our heads around that and change that mindset, it changes how we care for our patients and elevates them to the level they

belong. So off that soapbox for a minute.

Remember, under promise, over deliver. Know your products inside and outside. Be prepared for some fear and be patient when you explain what it means to your patient. They're going to be fine if we do that. So quick reminder of our learning outcomes.

We talked about the concept of DNNs and the patient friendly language successfully differentiated between sound and a pro through focus True noise reduction. We talked about how moving from 176364 to that 1762 is going to give your patient a better patient experience. We talked about some of the benefits of various features and different technology levels of the envision in language that's easier, easy for the patient to understand. And we successfully identified potential patient concerns and talked about how to develop language to handle them. So that's what we did.

I'm going to go to questions and some of the stuff here in the Q and A. But first I want to invite everybody. Dr. Laura Shocktail tomorrow is going to be delivering another wonderful conversation around the new Hearmax app and some of the changes as well as the Solus Max 2.1 be on it. It's going to be fantastic and there's some really cool stuff in that.

So thank you guys for making the time today. There is a question here. The possible additional directional benefit of true focus, clear focus. Can you obtain that using an open dome? Great question.

No, you cannot get as much of that improvement with an open dome. We really need to be able to manage those low frequencies in order to do that. Closed domes are the way to fit. I will argue this and I will go to fisticuffs with anybody who argues differently. Feel free to call me at any point.

We can have a good conversation around it. But open domes, in my mind are a dead technology. I haven't fit one personally on a final patient in more than three years. There's some phenomenal training

out there for the benefits of selecting the right domes and the rights occlusion systems for our patients. More occlusion is so often better, especially now that we have negative gain to offset insertion loss.

So stick with the closed dome. That's where we're going to get that directional benefit. And then somebody asked, would we show them the chart that breaks down the differences in models that showed the decibels you can develop? I would not use the one that we have on this particular slide because it's got a really cool rocket ship on it that is entirely irrelevant to the patient. But there are ways that you can take that same chart and customize it for your office to have your information on it.

And if it came down to the need to do so, yes, you can showcase that to the patient. But at the end of the day, I'm going to argue that 99% of our patients don't care what the number is. They really don't, because it doesn't mean anything to them. Instead, helping to just use the language up, we're giving up half of the noise reduction every time we step down is an easy way to clarify that for the patients. But yes, you could show that I do have some practitioners do it very, very effectively using that chart.

So great question. And I think that's the only two questions that I see. If anybody has any other questions, feel free to call me or email me. Email is see phoenix elton.com spelled like the city or the great mythical bird. And again, thank you for making the time.

And thank you, Kimberly, again, for phenomenal opportunity, experience, always taking care of us. And we will see you guys very, very soon. Have a great day.