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Beltone Boost Ultra-Providing Super Power Benefits to Those With Severe to Profound Hearing Loss

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- [Laura] Hello everyone, I'm Dr. Laura Schachtel the Product Training Development Manager at Beltone. And I wanna welcome all of you to our session on Beltone Boost Ultra, Providing Super Powered Benefits to Those With Severe to Profound Hearing Loss. Super Power hearing aids are designed to provide maximum amount of gain available to patients with severe to profound or profound hearing losses. In this course, we will discuss with patients with severe to profound hearing losses and the hearing care professionals that care for them may experience. We will also discuss factors for success in fitting and using our Boost Ultra. Before we begin just a little bit of housekeeping in the handouts pod, there are two handouts. One is a PDF of the slide deck that I will be going through that you can download if you want to have the slides and take notes on. And then the second one is our Beltone Boost Ultra product feature guide, which shows what features you get with the different technology levels of our Boost Ultra, and then there's also the questions pod. So if you have questions as I go along, please feel free to type them into that box, though I probably will not answer any questions until the end of this webinar. So with that, let's begin going through our learning outcomes.

So it's my hope that after today's session, you'll be able to describe the patient benefits of the new Super Power portfolio. You'll be able to describe the key characteristics of the Super Power hearing aid patient. You'll be able to utilize various sound processing options and additional features unique to this Super Power hearing aid patient. And then lastly, be able to describe the key connectivity and streaming capabilities that are available as well as benefits for this patient population. So, most Super Power hearing aids have a fitting range that looks similar to what you see on the screen, which is the fitting range for our Beltone Boost Ultra 95. Super Power hearing aids are designed to provide maximum amount of gain available to the patient with severe, severe to profound or profound hearing losses. Patients that benefit from Super Power hearing aids may be of any age with over 1/2 of patients presenting with severe to profound hearing losses under the age of 65. Many present with sensory neural hearing losses or mixed hearing loss, and maybe new or experienced hearing

aid users. Less than 10% of the hearing impaired population has a degree of hearing loss that would be categorized as severe to profound. It's important to note that for those Super Power patients benefit might be defined differently than for patients with lesser hearing loss. Benefits to a Super Power patient is that they're hoping to achieve might be speech understanding, or it might only be environmental awareness, which again is very different from the 65% of like mild hearing aid users who their benefit or what they perceive they want out of hearing aids is speech understanding especially in noise. And when we talk about that 10% severe to profound population, the benefit for them might just be knowing that a car is coming down the street. So, very different from what we might be used to dealing with in our regular appointment schedules. Individuals with severe to profound hearing loss have greater demands on their hearing aids than individuals with milder loss.

And perhaps this is because although they represent the smallest portion of hearing aid candidates, hearing aid technology for this group has traditionally lagged compared to other products. However, without appropriate amplification, users with severe to profound hearing loss will strain to hear and understand speech, hear and enjoy music, or even here important safety sounds like traffic at a busy intersection. Most of these individuals need and use amplification at all times. Many have had prior experience with hearing aids, and they require high quality dependable performance from their hearing aids. They also have a strong individualized preference for how they want their hearing aids to be programmed, and thus there is a need for great flexibility in programming for them. For many years Beltone has ensured the most up to date hearing instrument technology has been made available for all power levels. So with this launch of Beltone Boost Ultra, that happened at the beginning of this year, our commitment to power and Super Power users continues. The most advanced technology and connectivity solutions are now made available for those who stand to benefit from it the most. I always thought it was funny that this population had kind of older clunkier technology that didn't have any connectivity where you would think, wow, if they could stream the sound to their hearing aids, it would help them more. If

they could use the TV Link, they would actually get a lot more benefit out of it than someone with a more mild hearing loss. So, I am glad that Beltone is giving this more current technology to this smaller pool of patients who I think could really stand to benefit from it more than someone with a more mild hearing loss. So, by upgrading the Beltone Boost family with the Beltone Boost Ultra, people with severe to profound hearing loss get access to clear, comfortable, high quality sound, and the most up to date connectivity and personalized options. So as I previously mentioned, a patient that can benefit from Super Power hearing aids may be of any age. However, the needs of the patient with severe to profound hearing loss will differ depending on if the patient is an infant, a child or an adult. So today I will just focus on providing characteristics and needs of the adult Super Power patient as that's what most of us within the Beltone family deal with. We're not really equipped to handle more of the pediatric fittings.

So we're gonna focus more on adults in this patient demographic. And although it's difficult to pinpoint the varying needs of all Super Power patients, adult Super Power patients can generally be described in one of three ways, a New Super Power User, an Experienced Non-Linear Super Power User, or an Experienced Linear Super Power Users. And the terms, experienced non-linear and experienced linear should sound familiar to you because we also use those terms in our Beltone Solus Max fitting software to describe the patient's experience level with hearing aids. So, new Super Power users may be completely new to amplification, so unfortunately for them, they woke up one morning or after a few weeks developed a hearing loss, and it just happens to be a more severe hearing loss, or they have been previous users of standard amplification, meaning their hearing loss has progressed to the point that they are a Super Power user. And so it can be very difficult to lose additional hearing, and now need a more powerful hearing aid, or again, to just suddenly lose your hearing to the point that you are now required to have such a more powerful hearing aid and have such a more difficult hearing loss. So therefore one of the most important audiological services for these patients is dedicated counseling and support, 'Cause

just think about it, if all of a sudden whatever, say whatever it is that you had your vision, sense of taste, all of a sudden it's just gone, you're going through a lot psychologically, and though we're not counselors, we kinda act as surrogates in that field. You need to be there for your patient to just kind of hold their hand and let them just express whatever feelings or feelings because of the additional hearing loss that they now have. So, when we're talking about needs and fitting strategies, these patients are similar to other hearing aid users that would benefit from using wide dynamic range compression and high end technology. And this can be of great interest to this specific population of new users, 'Cause they might have had it in a more mild form of this technology, and now we can offer it to them in the Super Power range, or they've never had hearing aids before so good but to give you the best that we have out of the gate.

Patients that are considered experienced non-linear Super Power users may have been provided with digital technology initially, or have been patients that have successfully transitioned from analog linear technology to digital technology. Either way, this patient type may prove to be less challenging for hearing care professionals, because these patients will have experienced digital technology, it may not be in need of a transition time or time to allow the brain to adjust to digital sound processing from that linear processing. These patients are more likely to be interested in trying new technology. However, it's important to keep in mind that this population is still made up of Super Power users, and they will be extremely dependent on their hearing aids. So again, someone who maybe is a Super Power user, they had something that's a few years old and now they're in your office to upgrade, you'll have an easier time with them than our next group of patient population that we're gonna talk about, which are the experienced linear patients. And as I said, this group of experienced non-linear, they're used to hearing digital sound. So somebody, or you had already gone through that kind of counseling step with them, taking them from that analog sound, which is very different than digital, and you've got them over that curve. So, now when we look at our linear Super Powers, as I said, these are the ones that are the most challenging for

us to help and fit, 'Cause these patients have likely presented with severe to profound hearing loss for many years, possibly since childhood, and because their hearing losses were discovered in an age prior to digital technology, again, we're talking about adults who were found to have this severe loss as children. So again, digital technology wasn't there at that time, or it was really costly. These patients are often used to extremely powerful, low end BTEs coupled with full shell earmolds with little to no venting. And these patients may have had multiple pairs of hearing aids, or may have been wearing the same pair of hearing aids for years. As in like 15 years, they never had a new hearing aid, because they had held onto that one so dearly, because it's all they knew of hearing and it got them through 15 years of their life. These patients are very familiar with hearing loss and hearing aids, and have likely received ample amounts of counseling over the years. When it's time to replace their old hearing aids, these patients may expect to obtain a pair of hearing aids that are very similar to what they're familiar with, and may not want to "get used to new technology." And therefore these patients are rarely swayed by claims of new or best.

So, if they come into your office with this 15 year old pair of hearing aid, and you say, "we have the best new hearing aids" they're gonna look at you very skeptically because new to them is not what they want, they want same. So if you said, "I have a hearing aid that can do exactly what your old ones can do," that's what they would rather hear than, "I have something new and it's different, and it's the best one yet." They're gonna be very hesitant to go with something like that. I know with some people we like to market how new and great something is, but with this linear Super Power user, you might just try to refrain from using those words, 'Cause those are almost like scary words to them because they want old, "I'm comfortable with this. I like this. Let's just replace what I have. I don't want to try anything different." So Dr. Mead Killion stated that "it's far preferable to hear clear speech in clear noise, than distorted speech in distorted noise." This likely sounds agreeable to you considering speech understanding is what we strive to provide to every patient every day. However, in the experience of a patient who has been wearing linear Super Power hearing aids for a

very long time, we have to understand that this statement may not be the ultimate goal. If a patient presented with severe to profound hearing loss as an infant, child, or young adult, it's possible that the patient was fit with low end technology that was available through Medicaid at the time. Years of learning language through a peak clipping system, taught the brain to add meaning to distorted sounds. When living with the severe to profound hearing loss, a patient becomes very dependent on his or her hearing aids, especially a further supplemental communication skills like lip reading or sign language were not acquired. An experienced linear Super Power patient, wants new hearing aids to provide him or her with the same distortion that he or she has become accustomed to, because that distortion has meaning. And so my cousin was diagnosed with a hearing loss from birth and he was given, I think they were digital linear aids. I don't think there were fully analog just considering how old he is, but it could have been on that cost of maybe still being analog, that he hated them. Absolutely hated them, refused to wear them, because there was so much gain coming in that it like bothered him, it hurt his ears.

And he stuck with those as a child for 10 years. And then finally got digital custom hearing aids. And again never wore those because his brain had gotten used to whatever input the analog or the older hearing aids had, that he never got used to the new ones. And my aunt and uncle never forced him to wear hearing aids. And so he held onto that first set of truly digital hearing aids for about 12 years until he finally got a new pair like three years ago. So that huge 12 year mark of holding onto something, and then kind of assuming no matter how much counseling I did with him, that the new hearing aids he got were going to sound just like the old ones. And I said, "no things are better. We've learned a lot. This will sound better, and it's me, you can text me and I can make adjustments for you. It's not gonna be the same hassle as when you were younger." Though, he still doesn't wear his hearing aids and he just doesn't like any of the sound quality, because when I make it loud enough for him, it's too loud, but then when I make it softer, so it's more comfortable, he feels like he's missing something because it doesn't have that distorted sound that his very first pair of hearing aids had.

And that's the set that he learned language skills with. And so, again, as I stated, he kind of added, his brain added meaning to all of that distorted sound. So, when we're working with experienced linear Super Power users, many of us find that we need to balance encouraging new technology, and understanding why this population of patients are hesitant. So again, keep in mind that these patients may not be interested in getting used to new hearing aids or technology. They know what works for them, and therefore it's common to hear the phrase, "I want my new hearing aids to sound like my old ones." This need occurs when a patient is fit with new technology that reduces or eliminates the distortion that the patient's brain has become accustomed to. And remember, distortion has meaning to this patient population. The patient proceeds reduce understanding, and possibly rejects the new hearing aids, because the distortion is missing. It's not uncommon for a hearing care professional to trial several different hearing or fitting strategies with the Super Power user before the patient is finally satisfied with the sound quality, even if we consider the sound quality to be poor.

And so my mom also has a hearing loss. She has a conductive loss. So when she was fit about 30 something years ago, it was an analog hearing aid, and that worked fine for her type of hearing loss. Then as I got into the profession, I finally rolled her over into digital hearing aids, and again, she's not a Super Power user, it's a conductive loss. I know they're very different, but she was used to the sound quality that the analog hearing aids gave her, and the amount of gain pumping through it. So when I put the digital hearing aids on her, even though she had enough gain and she could hear and understand me just fine, she still felt like the hearing aids were soft and that something was missing. And I finally got around to understanding the something that was missing, was the extra distortion. And I had to just keep reassuring my mom, that she didn't need that distortion, and that she was hearing just as well, if not better, even though it felt softer and different to her. So again, she was my mom, so I forced her to, but she eventually got over that hump. And now she's on her like fifth pair of digital hearing aids past that one. So, it does take a little bit of hand holding, but we can get these

patients over the hump and we kind of need to, because analog just doesn't exist anymore and they're all going to have to upgrade into some type of a digital hearing aid. So again, some of them have already done that, but you still might get that one walking through the door and just kinda need to know what to expect that that distortion has meaning, don't forget that. And as you counsel them through, just kinda hand hold that, "I know that it has meaning, I'm going to try to give it to you, but just realize you don't really need that distortion. Even though it's a clean sound, it gives you all the meaning that your brain actually needs." So Beltone offers this flexibility for sound processing for our Ultra and Super Power hearing aids, which provides fitting flexibility. You will have the option to use wide dynamic range compression, semi linear, or linear signal processing in our Solus Max fitting software. The first compression mode, which is Wide Dynamic Range Compression, is available in all of our hearing aids, and provides compression that's prescribed by the selected fitting target, like our BAFA or if you choose NAL-NL2 or DSL, any of those targets, that's what the compression will be based off of.

The Semi-Linear option reduces gain for soft input sounds and increases gain for louder inputs. And this is only seen in our fitting software when you're fitting an Ultra or a Super Power hearing aid. And then lastly, we have Linear compression, which again is only seen for Ultra or Super Power fittings, and linear means the compression ratio is set to 1:1, where the input for soft gains and loud gains are set at the same level, and they kind of average out at that like middle input level. So this patient population might desire different compression modes, but these settings cannot be predicted from audiometric information, and you'll need to set this during the fitting process. And in order to get this information, you need to talk to your patient. So hopefully through case history, you have data on whether they ever wore hearing aids before, what they were, maybe depending on age of them you can rationalize if they were analog or digital. And so you'll need to select the appropriate patient experience when you come into our fitting software. So, on the patient page, we have the experience level for the patients, and there's a dropdown. And so you'll need to select the best that fits that

patient. So, if you select experienced linear, when you come into the fitting screen, linear will be selected as the compression mode. If you select anything else, so experienced, non-linear, new user, comfort user, it will default in the fitting software to wide dynamic range compression. Should you want to change that you can, and I'm showing you where you can. So in the fitting screen under the gain graph, when you fit the Super Power or Ultra Power hearing aids, compression that option box now appears under the gain graph, and you could switch it. You are able to switch the compression modes per program. So if you wanted to have the first program in linear and the second program in wide dynamic range compression, you can go ahead and do that. I just want to point out that the semi-linear option is not available for all of our price points.

So you may or may not see it depending on the technology level you and your patient selected. So, our linear setting has prescribed gain at each frequency that are the same for all input levels. So as you can see, there's just the one input level it says gain. And our compression ratio is 1:1. So we leave off that first number, 'Cause it's always one, and you're seeing the second number, which is one. So we are completely linear, there's only one line on our graph. The gains can not be controlled per input level 'Cause again, it's just the one, but you can adjust by frequency. So this setting is recommended for previous users of linear amplification who have a strong preference for this type of processing. The semi-linear setting has less compression applied when we compare it to wide dynamic range compression. And as you can see our three input levels are back, but if you look at the compression ratios they are very low. So slightly more linear than maybe wide dynamic range compression would be for this particular audio gram. This setting is recommended for previous users of linear amplification as a stepping point to wide dynamic range compression. And then lastly, if we look at our wide dynamic range compression, this automatically adjust the gain with the goal of being to ensure that we have audibility for soft sounds that conversational levels are comfortable, and that loud sounds are loud, but not too loud. And this setting is recommended for users who have already experienced with wide

dynamic range compression. And again, we have our three input points. And if you look at our compression ratios, they are a lot higher than what they would be for semi-linear. And so, as I said, semi-linear is a good stepping point. So if you have a patient who you're trying to have them let go of their linear sound, that more aggressive sound quality, you could in a way force them, by having program one be with wide dynamic range compression, and then give them program two that's semi-linear. And say, "I want you to hear in program one, but if you really need to, as kind of that safety blanket, you can go into program two and it will sound more like what you're used to." So that's just kind of a way you could step them out of relying on that linear harsh sound quality.

So compression is often a very hard subject to understand, also very hard to teach. So we're gonna look at this little sailboat analogy. So in this analogy, the water level represents the input level, and the sailboat represents the gain, and the bridge that we want to go under represents the maximum output. So as the tide or the input level rises and falls, the boat goes higher and lower under the bridge. The output is represented by the water level, plus the height of the boat, which would be input plus gain. So of course the boat has to fit under the bridge, which is the maximum output of the hearing aid. So in this image, the boat fits under the bridge because the water level is low. However, if the water level rises, the sailboat's mast is cut off in order to fit under the bridge. This is a representation of what occurs to the output of a hearing aid during peak clipping. And then this third image as the water level rises, the boat shrinks in size or technical term, it smushes down, which is represented by a reduction in gain with increased input. The boat returns to its normal size once it passes under the bridge. This analogy represents compression, and how output is limited, never exceeding the saturation point or MPO but allowing the amplified signal to remain intact 'Cause we didn't break anything. Note that the breaking of the mast in the second image represents the distortion that's heard by experienced linear Super Power patients. And again, it's that distortion that often time has meaning for them with speech understanding. So when we use linear amplification in Solus Max, we have the ability

to adjust the compression limit mode. And so we have two options. We have Hard Peak Clipping and Soft Peak Clipping. So with Hard Peak Clipping, as you see on the screen, as the signal comes in when it reaches the hearing aid saturation point or the MPO, it gets sliced. And so instead of a nice oval wave, the top of that gets sliced off. And now we have more of a square wave. And this naturally causes distortion in the signal or introduces sound that was not originally presented in the original input signal. This setting is recommended for patients with profound hearing loss, that were previously fit with linear amplification, excuse me. Or if your patient is requesting more power with linear compression, this makes it possible to make our Beltone Boost Ultra "sound like my old hearing aids." So we're in linear and we have Hard Peak Clipping and we're trying to add distortion in the cleanest way possible to hopefully make our patient happy that they're getting the distortion that they perceive as benefits. So if we compare that to our other option was Soft Peak Clipping, here, the peaks are reduced, but the sounds are still rounded instead of just completely cut off.

So this option results in better sound quality for most people than the Hard Peak Clipping option, because it produces less distortion. So this mode is recommended for patients with mixed or severe to profound hearing loss, who just happen to like linear amplification. And that's why Soft Peak Clipping is the default in the fitting software. So, you have that patient that wants their old hearing aids or the new ones to sound like their old hearing aids. You'll have to go into the software and switch it to Hard Peak Clipping. Another feature just for Super Power users is Low Frequency Boost. This feature adds additional gain to the low and mid frequencies. So when applied, there'll be a visible change on the gain levels of the frequencies that are affected. And just to note that if the maximum gain of the hearing aids has been reached, this feature will not generate a visible change on the gain graph screen, nor will the gain be changed since the compressor can no longer increase gain because you've reached its capacity. So, if you chose moderate, and moderate we're increasing 500 hertz 9 dB, if the chip only allows another 3 dB increase before we've hit capacity, your patient will get a 3 dB increase. They're not gonna get the full 9 because you've reached the

saturation of what the hearing aid can do. These changes to Low Frequency Boost can be changed per program. So you could have it set off in the first program to get the patient maybe used to something, and then turn it on mild in that second program to give them more sound quality, like what they were used to hearing. So that was a review of a Super Power user. We're now going to switch gears a little and talk about the Beltone Boost Ultra hearing aid and its feature set. So we've added features, we've upgraded existing ones, and improved the overall functionality to ensure that this is one of the most powerful hearing aids on the market so everyday life changes from good to ultra good. So all of the great improvements Beltone Boost Ultra offers are based on a more advanced and completely redesigned chip platform that provides 30% more computing power, a speed increase of 100%, a 20% reduction in power consumption, and provides a memory increase of 10%.

By means of the new chip and faster processing power, the feature set works seamlessly together to give your patients more clarity in speech understanding. They can now pick up subtle sounds, feel comfortable when loud sounds arise, and enjoy every moment. The new chip platform is the foundation of our excellent sound quality. We have a higher input dynamic range up to 113 dB SPL, meaning no distortion for loud sounds. We also have a new radio core processor to give a 5 dB better sensitivity for ear to ear performance. Meaning the amount of data loss has been reduced dramatically. We have the most advanced, efficient and reliable 2.4 gigahertz technology. Note that this increased sensitivity provides better audio signal when streaming, but also on the efficiency of transferring data resulting in improved functionality of Belton's advanced and unique signal processing strategies like CrossLink Directionality 2 with Personal Sound ID. Here's a look at our full BTE portfolio, and this is for our standard BTEs and Super Power BTEs. And as you can see we offer our Boost Ultra in all three of our technology levels. Also, all of our Boost Ultra hearing aids have 2.4 gigahertz connectivity, and can direct stream to Apple and selected Android devices. So the Beltone Boost Ultra is available in two form factors, the 86 High Power BTE, which comes with a metal ear hook for an additional 5 dB of

gain in the lower frequencies versus a standard plastic ear hook. It also uses a size 13 battery, has a multifunctional toggle and a push button, and has a telecoil in DAI ability. The Boost Ultra 86 has a frequency range of 100 to 5,270 hertz, and a maximum output of 140 dB SPL. The 95 Super Power version uses a size 675 battery, and also has the multifunctional toggle and a push button and telecoil and DAI availability. The Boost also 95 has a frequency range of 100 to 6,120 hertz, and a maximum output of 145 dB SPL. Although telecoils are seen as obsolete technology, tele loop systems are widely used in environments such as cinemas, theaters, places of worship and schools just to name a few. They're also used connect to compatible hearing aid phones, whether that's a landline or a cell phone. So, when the telecoil is activated, the hearing aid microphones turn off.

So there is no feedback potential for this patient, which is again, something of concern, especially when there's that much gain running through the hearing aids so the patient can safely put the phone up to their ear, connect in with the T coil and not worry that there's feedback. Plus the T coil has, stronger, is not the best word, but I'm just gonna use it, a stronger signal, so the patient might actually have a better conversation in a T coil mode, than if there's like an acoustic phone program or just using the speaker phone off of the phone. So Direct Audio Input or DAI, allows a direct connection from external audio sources to the hearing aids. DAI is a requirement for connecting to FM systems, and it's used to connect to our Cross and BiCross systems. So to do that, you would need to set up a DAI program in Solus Max, and DAI is one of the program options. So if you click the drop down box, DAI is available, and then you need to attach a DAI Boot. So it's a specific boot, it is different than our programming boot. I mean, it looks the same here, but you'll notice how there's those three pins where you would attach an FM receiver, or you would connect the little transmitter or wire for a Cross, or BiCross. You would put the hearing aid on the good ear or better ear, and then the offside mic would go on the bad or the dead ear. And then again, this would be used with our wired or other systems wireless Cross and BiCross options. Power and Super Power users often have extensive experience with hearing aids, we've

already reviewed that. So this prior experience means individuals have signal processing preferences or advanced feature preferences, or want certain things on or off in their hearing aids. So, as hearing care professionals, we need options and flexibility to meet what these patients expect out of their hearing aids. So with Beltone Boost Ultra, you have advanced features that catered to gain output signal to noise ratio improvement, and comfort. So we'll dive a little bit deeper into some of these signal processing strategies of the Beltone Boost Ultra, and go through why it's important for these patients with severe to profound hearing loss. So the unique needs of patients with severe to profound hearing loss, dry feature design, and power performance.

These needs include excellent localization for heightened awareness, a clear and comfortable power output with amplification across all frequencies, sound frequency compression, and advanced connectivity options for day to day interaction with their environment. And to address these needs certain features are vital, and these features are CrossLink Directionality 2 with Personal Sound ID, Feedback Eraser with Whistle Stop, Low Frequency Boost and Impulse Noise Reduction, Sound Shifter, and unrivaled connectivity to smartphones, wireless accessories, and loop and FM systems. The following slides will provide more details for these crucial features. And we'll start with our CrossLink Directionality 2. And this is a form of directionality that relies on ear to ear communication, to select the optimal microphone mode for each ear, so the strongest voice signal is clear without losing the ability to perceive the surroundings and other speakers. So, our patients can hear who they want to, but still maintain connected to the environment around them. This form of directionality was based off of historical data that showed patients prefer sound quality when in an Omni/Directional mode, but obtained better speech understanding when in a Directional mode. With this information, we designed our CrossLink Directionality to have four different microphone modes to allow for just that. And these microphone modes that the hearing aids transition through are the Bilateral Directional mode, which is the first one you see. Directional/Omni, Omni/Directional, which are the second and

third pictures, or sometimes we refer to them as the asymmetrical mode. And then the last one is the Bilateral Omni mode, where both hearing aids are in that Omni/Directional mode. Clinical studies show that our patients, when they're using CrossLink Directionality, that they were in some type of a directional mode only 22% of the time, which agrees with the historical research that patients like the sound quality of Omni Directionality. So by adding personal sound ID to our CrossLink Directionality 2, your patients get back spatial cues that were disrupted due to microphone placement and inter oral level differences. We have more vivid spatial awareness, or as I like to call it 3D hearing. The advantage of personal sound ID are seen when the patient is in the Bilateral Omni Directional mode. And as we just saw, that's about 80% of the time. So that means most of the time the patient is able to perceive spatially where sound is now coming from.

So my mom with her hearing aid, she is a custom hearing aid wearer, she refuses to wear anything else, but as we get new hearing aids out, I've always asked her to just try them, 'Cause I want her opinion. So of course the hearing aids I have RIEs, and so she'll wear them 'Cause she has a good spot about it. But for the longest time she kept saying, it just doesn't sound right, and I didn't know what that meant until one day she said, "it just sounds like all of the sounds are right in my face, but your further away from me than the computer is, but the computer and you sound like you're right in the same area. That there isn't any distance between the two of you." And then when I put on a pair of hearing aids that had personal sound ID, she said, "okay, now this sounds a lot more like my custom hearing aids, where I can tell that you're over here, your dad's over here, the stereo's over here. And I can tell in space where everything's located." So personal sound ID really does kind of put everything back spatially where it belongs. And so CrossLink Directionality 2 with Personal Sound ID, again, is an important feature that is available with the Boost Ultra 17 model. CrossLink Directionality 2 provides patients with improved listening and greater awareness of sound in many different environments. And the study by Kirkwood and Jespersen on how CrossLink Directionality 2 with Personal Sound ID applies a directional

microphone technology showing an improvement in ease of listening compared to just Omni or just Directional settings alone. So patients with severe to profound hearing loss saw a four dB signal to noise ratio improvement, and that translates to about a 60% better speech intelligibility for speech while maintaining audibility for speech coming from other directions as compared to other premium brands, which prioritize sounds from the front. So meaning patients could hear better when they had CrossLink Directionality on, and still maintain connection to their environment, they could still tell someone else was talking over there on the left, or that there was something going on behind them while other competitors out there, the patient could really only hear the person in front of them, and really not as much of what else was going on around them, because that manufacturer prioritized just hearing in front and said, it's not that important for this patient with severe to profound loss to be connected to their environment, which is really not true. And since gain that is needed for these patients with severe to profound hearing loss is very high, it also increases the likelihood for feedback.

So feedback will limit the amount of usable gain in any fitting. So Feedback Eraser with Whistle Stop has been redesigned with the new chip platform, excuse me, to provide the best feedback management gets. Feedback Eraser with Whistle Stop not only provides prescribed gain at the fitting, it also prevents feedback in daily situations without reducing gain. So saying not only do we have a very strong system when it's static, meaning it's just in a patient's ears, we also have a very strong system for dynamic changes. Like when you're placing a hand over your ear, you're putting the hair behind your ear, you're holding a phone up to your ear, we can still fight feedback in those more dynamic situations. So there is an increased risk of feedback with power and Super Power devices, because of the increase amount of output needed, which we just talked about. After sounds come in the microphones and it gets amplified. Sound can leak out of the hearing aid or earmold. If the sound leaking out is greater than the sound coming in, it can be caught in the feedback loop, interrupting the listener's experience. So, well fitting earmolds can help prevent this recycling effect,

but sometimes it can't. And that is kind of part of the importance of making sure that the impression you take is a good impression. It's not so much what material that your mold is, it's that it actually fits well. So, Feedback Eraser uses advanced dual phase cancellation to fight feedback. So in this image, the first curve is the feedback signal. And the second curve is the signal that our hearing aids put out, which is opposite in phase, and so that negates any feedback. This not only allows the prescribed amount of gain at the fitting, but it also prevents feedback without reducing gain. The next slide I'm going to show you the difference between our Feedback Eraser, and one of our competitors top brands. So, these two graphs show the effectiveness of feedback management for both our Boost Ultra, and a competitor Super Power product. So the teal coloring here is the desired response that we want. So that's the hearing aid in the ear set to a gain level where there was no feedback .

So that's the teal line. The blue line is once the feedback management system has been activated, and the red line is what we got when we measured with the handheld near the hearing aid. So with the Boost Ultra, it maintained the desired response in all cases. And as you can see it's a little hard to tell all the different colors here, 'Cause they all essentially line up right on top of each other. There is no feedback spike, there is no gain reduction, everything pretty much lines up about the same. But when we look at our competitor, I'm gonna keep the arrow here on the teal. That is the response that we wanted. That's the desired response. Once we activated their feedback management system, they reduced gain to stop feedback. And then once we put the hand up, once the feedback management system was on, we got a feedback spike. So, not only does this competitor's hearing aid reduce gain to stop feedback, in a dynamic situation of holding a hand up there, it doesn't stop feedback. And so recently a major competitor earlier this year launched "the strongest ultra power hearing aid on the market." However, please keep in mind and read through all of the marketing spiel, that just because they state that they have an output of a certain level, which is technically just slightly higher than ours, the important thing to ask is it really usable? Is whatever number they're throwing out there usable to the patient in real world

situations? 'Cause if it's only available or you could only get that number when in a test box, under laboratory conditions, is it really a benefit to the patient? With Feedback Eraser with Whistle Stop, it really does remain the best in class solution across the hearing industry. We don't have to make claims of best of, because it works and it has worked for a very long time. And with the new chip platform, it's just been enhanced even more so. So significant levels of amplification needed to help patients with the severe to profound hearing loss, allow them to feel connected and assured in their surroundings. Great, 'Cause they need all the gain to make up the amount of hearing loss. But the amplified experience can be fatiguing when uninteresting or unpleasant sounds are amplified, considering the small dynamic range of this population and the high levels of amplification that are applied to their hearing aids, it's not surprising that they may find impulse sounds especially jarring.

Using accurate environmental analysis, Impulse Noise Reduction takes the edge off sounds with sudden onset. The aim is for the gain applied to impulse sounds to be reduced in a way that is comfortable for the user without making sounds unnatural or distracting. To reduce these sudden uncomfortable loud sounds, Beltone Boost Ultra uses an ultra fast acting Impulse Noise Reduction. In a recent study that showed that 89% of the time, listeners judge the impulse noise sound as being softer when Impulse Noise Reduction was on. And again, it was softer, not that they couldn't hear it, it was just damping, that's the word I like to use. They could still tell it was a loud door slam, but it was damping and it wasn't as jarring and didn't kinda like take them back a minute or make them jump. They weren't as startled, it was just a damping sound, and as soon as that sound was gone, their hearing aids came back and kinda undamping themselves. One of the most important features for patients with severe to profound loss is Beltone Sound Shifter. Sound Shifter gives the patient the potential for greater higher frequency audibility. A relatively high proportion of Super Power users are simply not able to hear high pitch sounds, or the level of needed amplification to cater to the hearing loss for that specific frequency region would exceed the user's UCLs. So to solve this problem, Beltone Sound Shifter is compressing these inaudible sounds

into a lower frequency region where they are now audible. So to help illustrate this feature, we'll use our piano analogy where we unroll the cochlea, and the higher pitches are on the right side of the keyboard and the lower pitches are on the left side of the keyboard. So the high frequencies that are in audible are highlighted in purple in this example. So Sound Shifter recodes the high pitch sounds in that inaudible region and compresses them, making them available within the audible region, thus making these sounds audible again. And it's just a slight compression, we're not shifting, we're not taking something high frequency and moving it to a low frequency. We're just slightly shifting it over maybe 500 hertz to the next available frequency band in the cochlea that could pick up that frequency. So this could give some high frequency audibility back to some patients, not everyone likes this feature turned on, and that is something that you will have to trial and error with your patient to see if they like this, if it's giving them benefit or not. But it's a way to try to get those higher frequencies that they had no response to on the audio gram to actually be in play again, and help with any type of speech understanding. And our full ecosystem allows for direct streaming with Apple and Android products.

Again, it runs on that 2.4 gigahertz technology, allowing connectivity to our direct line of wireless accessories. And we have several apps that allow your patients to have even more flexibility with their hearing aids. So let's talk a little bit more about using accessories and apps with this particular patient population. Almost 1/2 of the population with severe to profound hearing loss is younger than 65. And we've talked about that where it's usually the younger ones that are starting to get these severe to profound losses 'Cause of something that they might've been born with. And while the uptake of devices like smartphones and tablets is sharply on the rise for older adults, which is our largest group of hearing aid users, it's widely used among younger people. So again, younger people seem to use more technology, more older people are the ones coming in with hearing loss, the severe to profound hearing loss range kind of more in that lower demographic, but the good news is more older people are starting to use technology, they have smartphones, they're using apps. So it's good that we're

now getting that blending of a specific patient population, and the technology and they're accustomed to using it so that we can offer a lot more flexibility to our patients. And well over 90% of adults under 50 are smartphone owners and approximately 3/4 of those 50 to 64 own smartphone. So like I said, it's growing in the right direction to match up with our hearing aid population of patients. Because of the diverse demographics in this group and the severity of their hearing loss, it's important to support their ability to use technology such as smartphones. And our Boost Ultra allows access to our complete ecosystem that we just saw. Patients can stream directly from their compatible Apple or Android devices to their hearing aids, and enjoy clear comfortable sound with a greater streaming bandwidth. And it's 9 1/2 kilohertz for Apple devices and 7 1/2 kilohertz with Android devices.

And every person is unique, and so are the challenges that you face in different listening situations. Beltone HearMax App places real time control at the user's fingertips. With a range of programs for different sound environments, users can optimize their hearing experience and this especially benefits users with severe to profound loss, since the challenges in their daily lives vary much more than for an average hearing aid user. And the Beltone HearMax App gives them the option to always be in control of a situation which results in more confidence and listening comfort. 'Cause again, if you just gave 'em one program and they're stuck with this, and they didn't want to touch something ear level, or they were afraid to, they're kinda stuck. So if you give 'em an app in a certain situation instead of having to remember, "okay, I need to go back and tell Laura next time I see her, this is what I want changed," they have some flexibility in their app to make changes on their own. So the next time they come in to see me, they can tell me about the situation, explain what they did that made it better. And then we can decide if that was just a one off environment and they feel comfortable making those changes, or that's something I need to do permanently for them with their hearing aids. But it just gives those patients who might be kind of, again, safety blanket, "You took away my distortion," but now I'm giving you an app where you have some control back in your life. So it might be a

good trade off for them. And wireless streaming of phone calls makes such a difference for these patients with severe to profound loss. In a study participant scored an average of only 6% on a speech recognition task, where speech was presented from a phone, that was held up to the hearing aid microphones. So kinda like an acoustic phone program, or no phone program at all, just held up to the hearing aid microphones. If we contrast that with the average improvement of more than 45%, when the sound was streamed bilaterally through the hearing aids. So, phone held up acoustically to one hearing aid versus stream bilaterally to both hearing aids, they got a 45% improvement. And this was true regardless of whether the sound was directly streamed through a smartphone to the hearing aids, or via the phone link 2. Additional benefit resulted in by adding visual cues.

So individuals with any degree of hearing impairment would greatly benefit when they can see who they're talking to. But those with severe to profound loss can potentially benefit the most. In fact, those with severe hearing losses rely as much on visual cues as they do on auditory information for speech understanding. So if we compare the use of phone acoustically at the ear through one hearing aid, where they only heard 6% of that, there was an average improvement of more than 70% when FaceTime was used and the participants could see the face of their talker during the test, and the audio was streamed to both of their hearing aids. So, a huge difference versus how we used to answer the phone, pull it up to one ear and not see the patient, versus now the audio is stream to both ears and they can see the face 'Cause of a Skype call or a FaceTime call. So, huge benefit especially for this population where they're just hearing that much poorer than our average patient. Another improvement enabled by the new chip platform is out of a particular benefit again to this patient population, is that the hearing aid's no longer in the background change listening programs to access streaming, whether it's directly to the hearing aids, or via the phone link 2. So previously there was a small delay, and it could be as much as four seconds where the hearing aids needed to realize that they are now needing to stream and to change that program to allow the streaming to start. And so that initially lost some of the audio,

from being transferred over to a patient. So they might've missed the beginning of a phone conversation, or the first part of some navigation instructions to where all they're getting is the name of the street, but they don't know how many feet away or yards away they are, and they don't know which direction they're turning, they just know the name of the street that they're looking for next. So they could really miss and get themselves all turned around. Including a direct line wireless accessory such as a myPAL Pro or a TV Link 2 can also improve listening for TV, music, meetings, and many other challenging listening situations. Using one of these accessories allows audio to stream directly into the hearing aids. And this will help with hearing the wanted conversation while keeping background noise down. And distance is always a challenge for this population as the further from a sound source the softer the sound.

So by using a myPAL or a TV Link 2, the distance from the sound source doesn't impact the sound quality as much, since the sound is now streaming directly into their hearing aids, and not traveling through sound waves through the air. And the relationship between you and your patient is vitally important, and it needs to be continuous, but sometimes it can be difficult for your patient to travel to see you, or they simply need a quick adjustment. Now, there is a flexible way for you to remain accessible and visible and ensure your patients get the care they need with Beltone Remote Care Services. So with Beltone Remote Care, and our new Remote Care Live functionality offers even more ways for you to connect to your patient, understand their individual needs and preferences and fine tune their hearing aids whenever and wherever they are. With Remote Care Live, you can contact your patient via a live video call. So now your patient can hear you, and they can see you as you remotely adjust their hearing aids through the Solus Max fitting software in real time. So again, they're hearing and seeing you, so their understanding of what's going on just goes up that much more as we saw in that previous study. And one thing I really wanted to point out when you're doing a Remote Care Live call, again, they can see and hear you, but if for whatever reason your patient is struggling to hear you, because maybe the streaming has now stopped to their hearing aids, and you're now on speaker phone as you're

making an adjustment, there is a text or a messaging system built into Remote Care Live, so you and your patient can remain in contact, even if the audio isn't as beneficial to them in the moment because you're making a change. So they're still connected to you, it's not like you're gone and they're kind of alone and isolated. They can still reach out and message and ask questions and you can type back to them. Or you can do both message and talk, so that they get all the potential for hearing and understanding what's happening during this virtual appointment. So just to summarize our hearing aid, these are the benefits of Beltone Boost Ultra Super Power family. So it features our newest chip platform, which offers high input dynamic range, and is the most stable power hearing aid on the market. And it offers a fitting range up to 120 dB HL with 140 and 145 dB SPL outputs, and an IP rating of 68. The Boost Ultra supports direct streaming to Apple and Android devices, wireless connectivity to our full line of direct line wireless accessories, has a T coil and DAI functionality, and then offers your patients a customized hearing solution through the Beltone HearMax App with Remote Care Services.

And before we go, I just wanna go through a case study to kind of show you how important it is for the Boost Ultra and how it really can help someone with that severe to profound hearing loss. So, we're gonna meet our patient Whitney Hale, and she is 70 years old. And she's a retired nursery school teacher, who has been wearing hearing aids since her teens. In her late 20s, she received a tympanoplasty on both ears due to Chronic Otitis Media. She has a congenitally based severe to profound hearing loss, which now has become mixed in both ears, that has progressively worsened over the years. Whitney has a very active lifestyle, she likes to meet friends, and is doing a lot of volunteer work for several nonprofit organizations. She demands a hearing solution that is not only able to compensate for her complex hearing loss, but especially enables her to hear well in very dynamic situations, and provides her with excellent speech understanding. Additionally, Whitney needs connectivity solutions for phone calls, TV, and tutoring. Currently she's wearing a Super Power hearing aid through one of our competitors. As previously mentioned, Whitney was wearing

competitor hearing aids, that are known for good quality Super Power products. Although she was happy with those hearing aids, her spatial orientation was low, and it was also hard for her to understand speech in noisy environments. Whitney's husband Bill, recognized these problems during their weekly grocery store visits, explaining that Whitney wasn't able to recognize where Bill was standing when he was trying to talk to her from the side or calling her name from behind. She also was only able to understand her son's speech when he was standing directly in front of her, so she could read his lips. Whitney also was having a hard time hearing the students she's tutoring, and would like to be able to hear phone calls more clearly, 'Cause right now she has to hand the phone over to Bill. Whitney was downplaying her challenges saying, "My hearing aids are doing their job just fine. And I only experience problems in specific situations." Whitney was fit with a pair of Beltone Boost Ultra, and her success after the first week of wearing was overwhelmingly good. She described her experience as being overall clearer and more natural.

She was able to localize more accurately, and differentiate speech and noise in a way that she was unable to before. Bill was impressed, not only that Whitney was able to recognize where he was standing when he was talking, but additionally that she even understood speech with ease in environments where she normally had to focus even when Bill was standing in front of her. Whitney also loved how easy she could connect to her smartphone, and use the TV Link and myPAL accessories to help with the TV volume, and when tutoring her students. She also loves that she can make adjustments on her own through her Beltone HearMax App, and reach out to her HCP for help any time, or schedule a remote fitting adjustment which saves her time. The features that Whitney and Bill are experiencing are our CrossLink Directionality 2 with Personal Sound ID, and our increased input dynamic range, also that the Boost Ultra chip set has been upgraded to process faster, making all our Beltone features more enhanced than ever before. Upon followup, the first thing Whitney described was the clarity of the sound. She described an experience in a noisy environment that accurately described her overall performance with the new hearing aids. She and her

son were having dinner in a restaurant, and she was now able to hear the guests at a neighboring table that were talking, while also being able to focus on her son's speech. Throughout the experience, she described a natural and effortless feeling. She could easily focus on speech, and didn't feel isolated as she often did with her old hearing aids. She also reiterated that she could not only hear, but also understand her husband when he was talking to her from the side or behind in the grocery store. With her Boost Ultras, Whitney is more self-confident and feels more like she's in control of her hearing solution more now than she has in the past. So the decision to keep the Boost Ultra wasn't hard based upon the sound quality she experienced. So in summary, upgrading to Beltone Boost Ultra with our improved sound quality, speech understanding connectivity options, and knowing that she was able to receive the hearing care she needed when she needed it, was a complete success for Whitney.

And so just to quickly summarize, I know I'm over just a few minutes, but we're almost done. Our learning outcomes here. Patients benefit from the sound quality of our new chip, which offers high quality sound, direct streaming to Apple and Android products, and to all of our accessories and our Remote Care Services. This patient population makes up about 10% of the hearing impaired population, and they use amplification and depend on amplification at all times, and most have worn hearing aids before, and they know what they want. The features in our Boost Ultra that are unique to this population are Low Frequency Boost, Impulse Noise Reduction, and Sound Shifter. And lastly, our Boost Ultra can connect to all of our accessories and everything within our full ecosystem. So, if you have questions and I don't see any yet, but if you have some, please feel free to send them in. Otherwise, I just wanna thank you for spending an hour with me, I really appreciate it. And I don't see anyone typing or any questions coming in. So if you do think of something, please feel free to email me later. But since I don't see any questions, again, thank you all for spending an hour of your day with me. And I will hopefully see some of you later, or talk to some of you later, but I'm gonna go ahead now and end the session. So again, thank you all very much.