Open Up a World of Power for Pediatric Patients

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[Presenter] Oticon's pediatric ambition is clear. At Oticon, we want to create a better future for every child with hearing loss, not least of those with a severe to profound hearing impairment. In most cases, these children need immediate support in order to open up to the world, connect with their loved ones, to grow, thrive, and learn. Now Oticon is introducing an advanced family of instruments that is truly setting a new standard among pediatric power hearing aids, and its my pleasure today to introduce you to this technology and how you can open up a world of power for your pediatric patients. But first, disclosure for you, my background is Pediatric Audiology, and I'm currently employed by Oticon serving in our Learning and Development Department. Earlier this year, we introduced Oticon Open Play which redefined what it means to provide child-friendly hearing care. Oticon is consistently rethinking what it means to fit a pediatric patient with hearing loss, what their challenges are, and how we can best support that.

With 360 degree access to meaningful sounds, and the fast and precise removal of noise, the latest Oticon technology is designed to help children of all ages, even in the most complex listening environments. OpenPlay brought the OpenSound experience and all of its benefits to children with hearing impairment, and now we continue that legacy. You may already be familiar with, but Oticon has quite the history of making high quality power instruments. Sumo was first introduced in 2005, and was considered the first digital super power device. It was followed up in 2010 with Safari Super Power, where we introduced Speech Guard and connectivity to the power segment. With Sensei Super Power in 2015, we introduced frequency composition, a minimally invasive approach to frequency lowering that makes more speech cues available. Building on Oticon's solid foundation in developing innovative and beneficial hearing instruments for the pediatric population, the next generation is now here. Introducing Oticon Xceed Play. Let's watch a short video to give you a better introduction to this device. With Oticon Xceed Play, Oticon introduces not only a super powered device, but also a new ultra-power style. The world's most powerful pediatric hearing aid, targeting children with severe and profound hearing loss. With this launch,

Oticon sets new standards for pediatric hearing care, and opens up a world of power for pediatric patients. With Oticon Xceed Play, hearing care professionals can now extend the brainhearing benefits to even more pediatric patients, no matter the severity of their hearing impairment. To better understand the product and the benefit that it brings to patients, we must first understand what are the needs of children with hearing impairment particularly severe to profound losses. In most cases, this population needs immediate support and optimal conditions in order to develop language. Every cue counts for the severe to profound user. This includes accessibility to all sounds via consistent and reliable amplification as well as accessories that allow for a connection to the world around them. It's imperative that the solution proposed for children address these specific needs.

Now it's not to say that there won't still be challenges however because we all know that the environments and conditions children listen in everyday can be challenging. First listening in noise is challenging in and of itself, and children are in noisy settings more often as compared to adults. Educational environments particularly are generally noisy. Enabling children to hear speech and noise is therefore crucial. Second, children do not always look at, or turn in the direction of the target talker when they listen. Awareness of sounds that come from other directions than simply from the front is also important. Incidental learning is also important for children, they learn and acquire new words and knowledge incidentally, often through overhearing of their peers and other family members. An additional challenge within our profession is understating what the child actually perceives. Auditory perception refers to how the brain interprets what it's heard. If and how the auditory system processes the sound that's been made audible through the hearing technology is central. Oticon Xceed Play is built on the Oticon philosophy that better hearing starts with the brain. We call this brainhearing, and it's an approach that supports the natural way children's brains process sounds. Oticon Xceed Play applies proven brainhearing technology to accommodate the special needs and challenges that power users face. With Oticon Xceed Play, Super and Ultra Power users are upgraded to the groundbreaking Velox S Platform, a significant step that will

allow even children with a severe to profound loss to benefit from the OpenSound paradigm. Providing access to a 360 degree balanced soundscape so that they get the opportunity to choose who and what to listen to. Velox S is an incredibly powerful engine. It is by far the fastest and most powerful platform ever developed by Oticon, and it's what gives Oticon Xceed Play the unprecedented computation power to deliver on the brainhearing philosophy. It's providing that open sound experience for children with severe to profound hearing loss now for the very first time. More specifically Oticon Xceed Play offers the following: industry leading output and gain; OpenSound Navigator and OpenSound Optimizer which gives consistent access to speech all day; speech enhancement features such as Speech Guard and Speech Rescue are also working to provide excellent sound quality across 48 processing channels and 14 fitting bands; and last but now least, TwinLink, including 2.4 gigahertz Bluetooth Low Energy Technology for the wireless connectivity to a comprehensive range of devices.

This full feature set may be familiar to you from the previous launch of Oticon OpenPlay. And in many ways all of these features work the same. So in this session we will focus on what do these specifically mean for the power user. For power users we share that every speech cue counts. With Oticon Xceed Play, they can now get more access to speech throughout the day with a 360 degree soundscape all with less noise. OpenSound Navigator can support better speech understanding and learning across environments. It is important because particularly in noisy environments, the traditional technologies in pediatric power hearing aids do not give access to clear speech from all directions. And this can limit the conditions for optimal learning. Current pediatric fitting guidelines generally recommend omnidirectional settings or automatic switching between omnidirectional and directional modes. Traditional omnidirectional technology gives unorganized access to sounds all around. This includes noise. And it makes it very hard for children with severe to profound hearing loss to separate speech from noise and understand what's being said. The brain has to work harder to interpret what's going on. Previously, the best and only way to support

people with severe to profound hearing loss in these situations was by using traditional directional technology. Using a narrow beam, focus is given to the speaker directly in front of the child. All other sounds, speech and noise alike, are reduced. Closing down other sounds creates a narrow and artificial environment for the listener with loss of overall loudness. This technology does not provide the stimulus that the brain needs and limits opportunities for developing basic auditory skills, incidental learning, and environmental awareness. With Oticon Xceed Play, children now with severe to profound hearing loss can have clear access to speech all around. This makes it easier for the child to hear, learn, and take part. The groundbreaking OpenSound Navigator works ultra fast and constantly monitors, prioritizes, and preserves speech from all directions. It reduces noise extremely fast even in between words.

As a result, Oticon Xceed Play gives access to more detailed speech. This makes it easier to understand what is being said, decide who and what to listen to, and develop auditory as well as language skills. By opening up to a more meaningful and balanced soundscape, opportunities for incidental learning and environmental awareness can take place. OpenSound Navigator and Xceed Play consist of the same three steps as before. Analyzing to scan the full sound environment more than 100 times per second and identifying noise and separating it from speech. It also balances to rapidly reduce the levels of loud noise coming from specific directions while preserving speech. And lastly noise removal which rapidly attenuates remaining diffused noise even between individual words, making all speech signals clear and detailed. To better support OpenSound Navigator, OpenSound Booster can be activated. This means that extra help in simple conditions where there is generally a better signal to noise ratio and otherwise the user would not receive as much support from the hearing aid. OpenSound Booster will change the hearing aid balancing to a very high setting when activated and will set the noise reduction in simple environments to a maximum of 3 dB. In this figure we see a range of listening environments that go from simple to complex, with the signal to noise ratio also decreasing along the x axis. Using the

prescribed setting or default of medium and simple environments, OpenSound Navigator will not balance the sounds sources nor will there be any noise removal. In complex environments, above the prescribed activation threshold, balancing and noise removal kicks in to support clear access to sounds all around the listener. This includes up to a 7 dB noise reduction. When activated, what we see happens is that the threshold moves down to start balancing and prioritizing sound sources. Noise removal then can be an additional 3 dB of reduction. When activating OpenSound Booster in the Oticon On app, this means that preferably an older child, such as a teenager, or in the case of a younger child with their parent, can override the prescribed setting in the hearing aids for as long as he or she feels that extra help is needed. The same effect as OpenSound Booster can also be achieved in Genie 2.

The programming setting needs to be very high and noise reduction in simple environments must be set to maximum. The user interface of Oticon On app has also been updated to make navigation more intuitive for the users. The functions in the app are the same as what users have been accustomed to such as adjusting volume, checking battery levels and switching between programs. The image on the screen is an example of the new home screen. The update will of course be available for both iOS and Android and is backwards compatible. Children with severe to profound hearing loss are often unable to attain the prescribed gain in their hearing aids due to the risk of feedback. This is critical because to these young hearing aid users, every single dB counts in order to be able to make sense of speech and develop just basic language skills. The innovative and multi-patented OpenSound Optimizer significantly changes all of this. Delivering optimal gain by proactively preventing feedback from happening. It's again the result of the speed and resolution that's now offered by the Velox S platform and contributes to a new algorithm and cancellation technique. This promotes a more optimized sound quality to OpenSound Navigator with less risk of feedback. OpenSound Optimizer contributes to a more stable system at higher gain levels, and this leads to fewer incidences of sound quality degradation. Hearing aid

behaviors and dynamic situations such as when chewing, talking and even hugging are problematic because they are not easily discovered by the hearing care professional. Traditional anti-feedback systems can leave pediatric power users under fit and manipulate the speech signal due to unstable amplification that's caused by feedback risk. Because these systems are so slow to react, they utilize gain reduction and other measures to keep the hearing aids stable. This results in compromised audibility, sound quality and speech intelligibility issues. In fact, traditional anti-feedback technology reduces gain of up to 10 dB by 50% of the day. This causes discomfort when feedback arises and compromises the child's ability to naturally focus on the surrounding sounds. OpenSound Optimizer helps to minimize these behaviors resulting in a better listening experience for the client. OpenSound Optimizer analyzes the amplified sound 56,000 times per second, and significantly reduces feedback before it even happens. It also dramatically reduces the gain reductions that occur throughout the day.

Oticon Xceed Play provides optimal amplification of speech. according to prescription in a much more comfortable and stable fashion. This gives better sound quality and consistent access to speech with increased comfort. And it allows children to play, hug, and interact more freely. This graphical representation then shows how significantly faster and unique the approach is with Oticon Xceed Play. Feedback can take on many forms and can have a complex waveform and spectrum meaning that finding the updated cancellation solution that works can take time. The mechanics of how traditional feedback systems react as changes in the environment take place may cause reduction in gain, dropouts, or the length of time alone to respond to feedback can disrupt the child's access to sound. If you're in the unfortunate circumstance where underfitting is necessary to control feedback, the result could be that the brain is deprived of speech cues that are crucial to its ability to make sense of sound potentially leading to a reduction in speech understanding as well as an increase in listening effort. OpenSound Optimizer is the new rapid response solution that goes into

effect to detect and prevent feedback while Feedback Shield LX works to stabilize the signal over time as a more long-term solution. Here is a look on a spectrogram of what feedback looks like. To orient yourself to this spectrogram, on the X axis this time and on the Y axis is frequency up to 10,000 hertz. The brightness of the color, the yellow, is where the feedback signal is happening, somewhere around the vicinity of 3,000 hertz. Also note that it is changing a little over time which really goes back to what we shared on the last slide about how feedback can take on different forms. Now what we see is the same spectrogram but we've applied the highly patented technology of the breaker signals found in OpenSound Optimizer. OpenSound Optimizer breaks the feedback path by turning amplification down and back up again very rapidly but only in the frequency bands where feedback is building up. So it's very specific. These changes are called spectrotemporal modulations. These are modulations or patterns that change over time and across frequency bands. These changes are soft, non-intrusive, but at the same time can be very effective at stopping feedback. The modulation can be seen as stripes in the spectrogram and they're located in the frequency region where feedback was present. In this picture, it's the dark almost vertical stripes.

The darker the color, the lower the energy. What you'll notice though is the original signal is still visible and also audible in between. Just to make sure that there's an understanding of the timing of the breaker signals, OpenSound Optimizer needs 60 milliseconds to handle feedback, meaning both to detect and to prevent. This means that we have a minimal impact on both frequency and time and therefore a minimal impact on the speech spectrum. In situations where the change in acoustic performance is persistent, Feedback Shield LX takes over. In order to improve efficiency and accuracy, Feedback Shield LX operates in two separate paths, one for each microphone. And each of these three distinct technologies work together to instantly suppress potential feedback. There may be a frequency shift, a phase inversion, or gain control. And without the high risk of feedback, it is possible to fit pediatric power users with up to 6 dB more stable gain. This provides the brain with up

to 20% more speech cues. Again particularly important for this population where every cue counts. Now professionals are better equipped to make sure that the child leaves the clinic with a well-fit hearing aid that gives more access to speech throughout the day. Let's revisit the other core technologies that make up Oticon Xceed Play. Speech Guard LX and Speech Rescue LX. Speech Guard improves speech understanding in noisy environments. And it does so by an interesting blend of both slow and fast compression time constants. Speech details are best maintained with a slower processor. Other sounds in the environment can be better processed with faster compression. Speech Guard is unique because it has two different ways of measuring these changes in the signal over time. Those two systems are constantly talking to each other. If the moment to moment level differences in t he signal are consistent with speech, then the slow time constant, which is more linear, is applied. If it is not consistent with speech, then it will switch to the faster time constant.

Here you can see how Speech Guard looks visually compared to the fast-acting compression. Fast-acting compression causes a welling up of soft sounds which muddies up the speech signal giving a much more densely packed signal over time. In other words it tends to recontour the wave of speech, thus compromising the details that the brain is expecting to receive. Speech Guard, however, creates a much truer replication of the original signal, preserving as much detail of the speech waveform as possible. This gives a more natural sound and a better opportunity for the brain to comprehend the speech input. Although speech guard has been around for a number of years, it has been enhanced over time. The LX on the end means that it is now the enhanced version on the Velox S platform. Since we're trying to maintain as many of the original details of speech as we amplify, the power of the Velox S platform allows us to significantly increase the resolution of the speech signal thus allowing us to do an even better job of maintaining those details. As evidenced by Andrea Pittman and her colleagues in their research in 2014, this approach ensures that the signal is audible immediately after loud sounds. And it improves children's speech understanding in

noise while also approving their ability to complete complex auditory task at the same time. Speech Rescue LX is the unique frequency lowering approach that Oticon employs to help children hear high frequency sounds like the S and TH which are important to speech development. It rescues the frequency sounds where inaudible speech cues are located by copying them and thus preserving high frequency stimulation. It also adds them to the frequency range that a child can potentially hear better. In doing so, these speech cues are not lost. So children can hear more speech sounds and increase their speech understanding. We're gonna turn into a video now to help you understand a little bit more about how this process works. New insights into frequency lowering has led Oticon to develop this innovative approach. Sounds of different frequencies activate different regions in the brain in an organized manner. Through Speech Rescue technology, high frequency sounds that are shown in purple are moved to lower frequency regions which allows the brain to respond to the copied sounds in a different area. Tonotopic organization of the cochlea is maintained throughout the auditory system while maintaining also its presence in the original position. We call this a copy and keep approach. Amplifying high frequencies can be a challenge especially for clients with a sloping or severe hearing loss.

One way to handle this problem and to offer more speech clarity is frequency lowering. Conceptually one of four basic frequency compression techniques are used. The type of technology used differs based on the manufacturer. Some hearing solutions squeeze sound together along the frequency axis pressing a lot of information into a small area and leaving the high frequency region unstimulated. Others may cut and paste with no regard to keeping high frequency information at all. Oticon uses the composition technique called Speech Rescue LX. Again, copy and keep approach. In Speech Rescue LX, high frequency content is copied and positioned precisely with great care in the region where the client is expected to have better usable hearing. The destination is dependent on the hearing loss or what we call the maximum audible output frequency, MAOF for short. This graphic zooms in on Speech Rescue LX from a

cochlear perspective. Imagine rolling out the cochlea with the colors indicating different frequency regions. The high frequencies are represented at the based of the cochlea and lower frequencies towards the apex. The blue shadows represents a hearing loss. As this animation illustrates, Speech Rescue LX moves the vulnerable high frequencies out of the blue shadow hearing loss area to a frequency region where the client should be able to hear the sounds more clearly. The default setting for Speech Rescue is off for both pediatric and adult fittings. When the decision is made to activate it, high frequencies are always enabled which means that Oticon takes advantage of stimulating any usable hearing or residual hearing in the high frequencies. The Speech Rescue calculation, based on the audiogram, is made whether Speech Rescue is decided to be on or off. So you will see the prescriptive targets visible even with off. Screenshots here indicate the display that you'll see in Genie when Speech Rescue is disabled if you look towards the left image. And when it is activated which is the right image. Once the configuration of the signal is set and verified, it's time to ensure that the strength of the signal is optimal for the patient to hear. The S stimulus is shown with increasing degrees of frequency composition in the graph. The purple, blue, and orange peaks indicate that the strength of the signal has either been increased or decreased by using the plus and minus handles on the bar while frequency composition is being held constant. It is recommended to verify to see if adjustments are necessary or to ensure the best setting possible that maximizes audibility.

This protocol shown is a collaboration between UWO and Denmark. It can be found on their website, dslio.com. Or we have a white paper that shows the step-by-step details. It does require the use of a calibrated S stimulus which is on most current verification systems. Overall, Speech Rescue LX helps children to hear more speech details, specifically targeting hard to reach, high frequency sounds that ultimately help increase speech understanding. Speech Rescue LX helps end users to perceive more speech details clearly and supporting engagement and conversations because the copy and keep method employed preserves that speech signal, meaning nothing is removed,

Speech Rescue LX is able to accomplish additional clarity with minimal disturbance because it uses that naturally-occurring vacant spaces in speech for the destination spots. This produces no interference to the signal from 1,600 hertz or below. This all delivering on the brainhearing philosophy of supporting the natural processes of the brain and creating a more natural overall sound. With Oticon Xceed Play, power users get the combination of NFMI and 2.4 gigahertz connectivity so that we can combine the great audiology with benefit to Bluetooth with no compromise to sound quality or a functionality of the devices. TwinLink is comprised of, first, a near-field magnetic induction system, or NFMI. This technology offers real time binaural processing. Binaural exchange of information at high rates of speech preserves the inter-aural loudness differences that are important for localization among many other things. In addition to the NMFI, TwinLink also provides a 2.4 gigahertz Bluetooth Low Energy technology. This enables wireless streaming of high quality stereo sound to both ears. The streaming is fast and clear, free of unwanted noise, and battery consumption is low as compared to standard Bluetooth. As a result of TwinLink, Oticon Xceed Play connects wirelessly to modern smartphones and gives access to a wide range of accessories via the 2.4 gigahertz technology providing direct streaming of stereo sound to both ears. For children with severe to profound hearing loss, all accessories and add-ons that can boost the signal to noise ratio and make everyday life easier are very highly appreciated. More specifically Oticon Xceed Play offers an extensive range of connectivity possibilities. With the TV adapter enabling sound to be streamed from a TV directly to multiple pairs of Oticon hearing aids.

With Oticon On app, as we discussed earlier, it makes it easy for parents or older children to control the hearing aids with just a touch of their finger. Adjusting the volume, checking the battery level, switching between programs, activating OpenSound Booster and also Find My Hearing Aids. Oticon Xceed Play is made for iPhone and connects to any modern smartphone via ConnectClip. ConnectClip can turn Oticon Xceed Play into a high quality wireless headset that streams sound to both

ears. ConnectClip can also be used as a remote microphone to enhance communication. It's ideal in challenging environments where there's poor signal to noise ratio such as in the car. For music it allows users to enjoy this in both hearing aids via stereo streaming directly from the iPhone, iPad and iPod Touch. Or use ConnectClip with any Bluetooth-enabled device. Users can create a wireless headset connection and chat seamlessly over the computer. Pair ConnectClip directly to the computer via Bluetooth or using the Bluetooth dongle 800. User are enabled to answer calls that are made to a stationary telephone wirelessly. Phone adapter 2.0 attaches to conventional telephones and streams calls to the hearing aids via ConnectClip. And lastly the remote control allows users to discretely and regulate their volume, switch programs, or mute the hearing aids with the touch of a button. Classroom settings have become even more diverse and demanding. And children with hearing loss struggle to keep up with what's happening around them.

Oticon Xceed Play also offers a broad range of classroom connectivity options that ensure technology does not stand in the way of smoothly integrating students with their hearing loss. Completely integrated solutions within the built-in 2.4 gigahertz Bluetooth Low Energy have a receiver in the Oticon Xceed Play. And it enables the hearing aids to seamlessly connect with Oticon's ConnectClip. The ConnectClip remote microphone enhances communication in these difficult environments. Gaining clear access for instance with the teacher's voice and in addition enables the child to stream directly for many other electronic devices. Oticon's dedicated Amigo R12G2 FM receiver integrates smoothly with the design of the Oticon Xceed Play BTE whether the super power or Ultra Power design. It's a design-integrated solution that allows connection to current Amigo FM transmitters. Oticon Xceed Play also ensures full compatibility with existing classroom solutions through the FM10 adapter. The student can obtain a universal ear level solution by attaching any universal receiver to the FM10. Oticon Xceed Play with its telecoil capability also ensures compatibility with Oticon Amigo transmitters through the Oticon Amigo Arc FM Universal Neck Loop

Solution. So now let's take a deeper dive into the practicalities of what it is that we've been talking about. There are two price points for Oticon Xceed, Xceed Play 1 and Xceed Play 2. Both are available in the SP or UP-style devices. Note that Oticon Xceed Play 1 holds the same feature set as Oticon Open Play 1. And Oticon Xceed Play 2 holds the same feature set as Oticon Open Play 2 with the exception of OpenSound Navigator that now has a 5 dB max noise reduction. In a simulated ear coupler, Oticon Xceed Play showcases industry-leading output and gain. The BTE ultrapower boasts 146 dB SPL MPO with 87 dB full-on gain. While the BTE Superpower is powerful in and of itself, with 143 dB SPL MPO and 83 dB full-on gain. Here are the fitting ranges for these new styles of products. Oticon Xceed Play easily covers hearing losses up to 120 dB HL. Oticon Xceed Play BTE SP has a bandwidth of 6,500 hertz, while the BTE UP has a bandwidth of 5,700 hertz in an ear simulator. For Xceed Play, 12 colors are available. These are the familiar colors that you've come to know and love from Oticon Open Play and it matches most of the children's needs. Oticon Xceed Play is specifically created with the pediatric patient in mind, meaning it is designed to stand up to the test of childhood. Some highlights of this include a tamper-resistant battery drawer, an IP-68 rating for water and dust-resistancy, as well as an LED indicator that gives visual confirmation for how the battery is functioning.

Keeping batteries out of reach of infants, small children, and people with learning difficulties, a tamper-resistant battery drawer should be used. This is obligatory for children below three years of age. Oticon Xceed Play can be ordered with the tamper-resistant door already mounted on the devices, or the tamper-resistant doors can be ordered separately. When ordered separately, the tamper-resistant door is supplied with the relevant tools and instructions needed to easily lock and unlock using the dedicated tool. How to lock and unlock the tamper-resistant battery drawer. To lock the drawer, close the battery drawer completely and make sure that it is locked. The tool then using the blue pin tool may also be red depending on your market. You will simply insert that, move the pin to the right and hold it. It's almost as if you're

pushing against a spring to compress it. Now you can easily open the battery drawer. Oticon has also minimized the risk of an allergic reactions by excluding more than 200 potentially harmful substances. All materials in Oticon Xceed Play are tested for biocompatibility, meeting strict international child safety standards, and are completely hypoallergenic, free from materials such as phthalates, latex, and nickel. Oticon Xceed Play BTE SP and UP has a three-button system that's for easy operation of functionalities. The single push button controls programs and flight mode. And the double push button controls volume and mute function. For Oticon Xceed Play ordered for children birth to three, an undamped child hook will be mounted and a damped child hook will be included in the packaging. Xceed Play orders for children above three years of age has a standard adult hook mounted. Oticon Xceed Play comes with the two colored LED light. When fitting the child, the LED is on by default but can easily be activated in the Genie and fitting screen when needed. Xceed Play SP is powered by 13 battery with the option of both a tamper-resistant battery drawer or an FM accessories drawer. The new styles also include both the 2.4 gigahertz and a telecoil. And the SP and UP are rated IP-68 for maximum dust and water resistancy. There's a small animation here that I wanna pop in to showcase to you some of the vibrations that happen within the instrument. In order to create the most powerful hearing aid in the world, the design of the hearing aid had to be optimized to make the general performance more stable. In this simulation of the vibrations, it is obvious why it's important to minimize and handle the vibrations in the hearing aid caused by the high sound pressure. The shell design makes the hearing aid fit better on the ear and makes it possible to optimize the placement of the components inside the hearing aid. The components have been placed very carefully to avoid as much vibration as possible and to eliminate mechanical feedback and make the performance more stable. The microphone inlet has been redesigned to balance out mechanical feedback that's normally created by vibrations added together from the microphone tube and the membrane in the microphone. The vibrations caused by the membrane in the microphone have now been reversed. So the vibrations from the two different locations

will now cancel each other out. The sound type box serves the purpose of encapsulating the sound pressure radiated from the vibrating receiver to avoid internal feedback. Additionally for Oticon Xceed Play, the speaker suspension has been updated to make it more resistant to shock, and thereby minimize the risk of damaging the speaker in case the hearing instrument is dropped to the floor. These improvements equal less mechanical feedback that is often a limiting factor on the performance of the hearing aid. To wrap up what we've heard so far about Oticon Xceed Play, with Velox S and OpenSound Optimizer, we are able to deliver 6 dB more stable gain. This can potentially make a significant difference for this user group where every single speech cue counts. Furthermore providing 87 dB peak gain allows for maximized audibility. Speech Rescue LX with Speech Guard LX ensures access and preservation of even more speech cues. People with milder degrees of hearing loss may struggle in noise. Providing a state-of-the-art noise handling system such as OpenSound Navigator is therefore even more crucial in this user group that really depend on help from their hearing instruments. And extra help is a necessity for many with a severe to profound hearing loss.

Delivering solutions for mobile phones, TVs, computers, and communication is crucial in a world that's becoming increasingly digital. Knowing the very specific issues of severe to profound hearing loss Oticon has introduced Oticon Xceed Play to meet the needs of these pediatric patients. And it's this powerful edition of Oticon Xceed Play in the SP and UP designs that completes the Oticon pediatric portfolio. But to be able to truly open up the world to even more people, we're also now introducing Oticon CROS. CROS is short for contralateral routing of the signal. It's not a new concept. It's been an important treatment approach for people with single-sided deafness since the 1960s. But it is new to Oticon. And with the addition of this innovative OpenSound Navigator technology, it means that we can offer the OpenSound experience and its benefits of hearing sounds from all sides with superior sound quality to patients now with single-sided deafness. Oticon CROS allows Oticon to once again live up to our

mission to provide a better future for every child with hearing loss. So what is single-sided deafness? It's defined as an unaidable hearing in one ear and normal hearing or an aidable hearing loss in the other ear. In other words the person suffers from unilateral hearing loss which is so great that he or she does not benefit from amplification in the other ear. Either due to total loss of audibility or that their speech recognition is so poor that traditional amplification just would not make sense. Single-sided deafness can result in poor speech recognition abilities and noise, especially when sounds are present on the poorer side. Furthermore it can cause reduced localization abilities and reduced ability to judge distance or direction of sound. Oticon CROS builds on the Velox S platform offering outstanding processing speed and sound quality as well as the OpenSound Navigator feature that gives access to the OpenSound experience for both simple and complex environments, a feature which can be highly relevant for people that have the issues associated with single-sided deafness, reduce localization ability, and poor speech recognition in noise. Oticon CROS not only helps in the simple and complex listening environments of everyday life, but also offers unique opportunities for streaming.

As the first in the industry, Oticon CROS features TwinLink that offers dual streaming and allows for users to enjoy wireless streaming without being excluded from their surroundings. As with other CROS systems in the market, Oticon CROS consists of a transmitter and a receiver with its basic principle being to overcome the head shadow effect resulting from single-sided deafness. Oticon CROS sends a high quality wireless NFMI signal from a transmitter that's located on the poorer ear to a receiving device that's now on the better ear. So the clients achieve a fuller, more immersive sound experience. A bi-CROS system does essentially the same thing. However, bi-CROS is relevant for people that also need amplification on their better hearing ear. This means that in addition to receiving sounds from the poorer ear, the receiving device also provides amplification based on the hearing loss in the better ear. The signals from the two ears are mixed and sent into the ear canal. The differentiator on the transmitting

device from the receiver or hearing instrument is located on the battery door where you'll see the words Oticon CROS. And as we discussed earlier, NFMI is a part of TwinLink, the dual radio system consisting of binaural communication between hearing instruments, and the 2.4 gigahertz Bluetooth Low Energy technology for streaming. Oticon CROS uses NFMI for high speed transmission of sound from the transmitter to the receiver. Using TwinLink means that the 2.4 gigahertz is also available for streaming to the receiving hearing aid without sacrificing the sound transmission between the transmitter and the receiver. Today, streamed sounds are a natural part of our lives with or without hearing loss. So having stream sounds can make a difference to users in various situations so that they still have access to important speech in the environment on the poorer side while streaming. More specifically having OpenSound Navigator means that the signal going into the microphones on the transmitter is first analyzed, balanced, and cleaned of noise before it's transmitted to the better ear. Having OpenSound Navigator working in the transmitter is key to helping CROS and bi-CROS users cope with noisy environments, and delivering the OpenSound experience. Again, a way to support the brain naturally in the way that it likes to make sense of sound. Oticon CROS is not intended for small children.

The recommendation is not to provide the solution for children below three years of age. The main reason being that a tamper-resistant battery door is not available for the transmitter. The transmitter is available only as the many right T style with a telecoil. It is compatible with Velox S based hearing instruments with the exception of Oticon Open S3 and Oticon Open Play 2. Additionally note that the cross transmitter only comes in the seven standard adult colors and at the receiving hearing aid must have firmware 8.0 in order to be compatible with CROS fittings. As a final thought for other hearing losses were surgical approaches such as cochlear implantation have been implemented, all Oticon power hearing aids can be fit together with any CI. Today, many children are implanted with a cochlear implant in one ear. And bimodal fittings have become more and more common over the past decade. There are many reasons

to choose a bimodal solution particularly if the child has aidable hearing on the other ear. First of all, having access to sound from both ears will provide the child with additional low frequency cues. This is important particularly taking into account early speech and language development. Providing children with as many speech cues as possible is important in order for them to obtain experience with language and help them build their perceptual world. The bimodal fitting tools are now available in Oticon Genie 2. As developed by Carisa Reyes at Boys Town National Research Hospital, the bimodal fitting flow chart serves as a guide to clinical audiologist as they navigate the bimodal fitting process. The goal is to provide a logical method for decision making, yet keeping in mind the constraints for everyday clinical practice. In summary, Oticon Xceed Play BTE SP and UP set new standards within pediatric power hearing aids. Thanks to new technology including OpenSound Navigator and OpenSound Optimizer, the Oticon Xceed Play instrument helps pediatric power users to hear more. It thereby provides better conditions for speech understanding and language development as well as participation in everyday life.

Oticon Xceed Play joins our high quality line up of Oticon Open Play power instruments all with an Open Sound experience and a wealth of features. From a selection of many writes with 105 speakers, this also including, a rechargeable style, as well as a BTE plus power, now to the BTE SP and UP in Oticon Xceed Play. Whatever your pediatric patients may need, Oticon has you fully covered. This is now the Oticon power lineup for your pediatric patients. I wanna thank you for your interest in this session. Stay tuned as we begin to share more information and trainings that showcase the details of the Oticon CROS, Genie programming tips and tricks, and also the latest offering for adults with severe to profound hearing impairment, now the Oticon Xceed family of instruments. Until then for more details you can reach out and contact your Oticon representative particularly Oticon pediatrics for any of your Oticon Xceed Play needs. Thank you.