This unedited transcript of a continued webinar is provided in order to facilitate communication accessibility for the viewer and may not be a totally verbatim record of the proceedings. This transcript may contain errors. Copying or distributing this transcript without the express written consent of continued is strictly prohibited. For any questions, please contact customerservice@continued.com

How Do You Solve a Problem Like Single Sided Deafness? in partnership with the American Academy of Audiology

Presenters: Melanie Lutz, AuD, Virginia Milne, AuD

Tish I'm Tish Gaffney, President of the American Academy of Audiology. The Academy is the home for audiologists. We are dedicated to achieving recognition of audiologists as the experts in hearing and balance care and the field of audiology as an independent clinical specialty that is integral to the healthcare team. We offer our members the latest resources for practice management and clinical evidence based practice so that they can grow professionally and improve patient care. We advocate for our members in Washington and throughout the country to ensure that the voices of audiologists are heard and we help connect audiologists to one another through valuable networking opportunities.

If you like this webinar, then make sure you join us each year at the annual AAA Conference for thought leadership that you won't find anywhere else. Learn more about the conference and how to join the academy@audiology.org thank you. Thank you so much, Dr. Caffney. Dr.

Milne, if you can advance the very next slide.

Now it's my pleasure to introduce our two guest speakers today, Dr. Virginia Milne and Dr. Melanie Lutz. Today we'll be speaking about single sided method, and again, this course is in partnership with the American Academy of Audiology. I'll hand the mic over to you now, Dr.

Milne and I think this course is a great example of what Tish was talking about in terms of content at the AAA conference. Because Melanie and I presented this together at the conference last year, we did make some minor additions to this talk. These are both Melanie and I's disclosures as well as this is the limitations and risks of the content and participation in this talk. These are our learning outcomes for the course. Today I'm going to turn this over to Melanie where we're going to go through some cases and talk about different SSD patients and Melanie is going to lead us off with some pediatric cases.

Great. Thank you. Single Sided Deafness as many of us know, we can usually define it as hearing loss in one ear that cannot be atable by a traditional hearing aid and normal hearing in the contralateral ear.

Patients with single sided deafness or SSD make up a pretty small subset of our hearing loss patients when we consider our binaural hearing loss patients, but they can usually occur with a variety of etiologies and they can be diagnosed at any age, which is why pediatric audiologists might deal with many SSD patients, as would audiologists who work primarily with adults or the geriatric population. So here we see a audiogram that's a pretty typical display of a patient with ssd.

We see a significant pure tone Loss in the poor ear, the left ear in this case, and we see normal hearing in the contralateral ear. So these patients usually will also present with very poor word recognition, as could be expected in their poor ear. And it might even be too difficult to complete testing with these patients. Usually they will also experience some sound intolerance in the poorer ear, which can lead to difficulty testing at the levels that we would need to test at. Additional Listening Listening difficulties in their daily lives could include difficulty localizing sounds.

Because they're only using one of their ears, they will have poor speech, understanding and difficulty listening in the presence of background noise. So those are some of the main complaints we hear from our SSD patients. So for some of these reasons, a traditional hearing aid in the poor ear will generally not be a very good solution for this patient population.

So we have to look at other ways to improve their listening needs. These options can include a contralateral routing of sound device or a cross device, a bone anchored hearing device or a cochlear implant. Alternatively, another option I should mention is to forego any device and just monitor the hearing for changes in the better ear or perhaps changes in the perceived challenges that the patient faces with their unilateral hearing loss.

During my time working clinically in a pediatric hospital, I diagnosed and followed many SSD patients from varying ages birth to age, 21 years. Within the pediatric population that I saw, the most common etiology is usually a cochlear nerve deficiency cnd. This is a term that describes a cochlear nerve that

that's absent or that's much smaller than expected. And as you can probably infer, this is usually associated with a sensorineural hearing loss. And you do need to complete imaging to confirm a diagnosis of cnd.

The other most common etiologies for pediatric SSD patients would include a cytomegalovirus infection, CMV infection, a mumps infection, anomalies in the inner ear which would be uncovered during imaging, and then auditory neuropathy spectrum disorder. So let's begin discussing some of the treatment options that are available for the pediatric population.

So one of our options that I'll first discuss is that of a bone anchored hearing device. A bone anchored hearing device can be worn near the poorer ear and will then stimulate each cochlea. And there are a variety of ways that this device can be coupled to the user, which could be either surgical or non surgical. For example, a non surgical option would be a headband or a soft band that goes all the way around the head and then a Surgical option might include a percutaneous abutment, so an abutment that is going through the skin and into the bone, or a transcutaneous magnet and transducer type of setup. For many patients this option has the potential to improve on ability.

But a bone anchor hearing device is not going to improve localization as we're stimulating both cochleas, both the poor hearing ear and the better hearing ear. So we won't benefit from improved localization. And this option is again not providing the patient with true binaural hearing as they aren't gaining more functionality from the poor hearing cochlea. The other thing to consider is the ease of access, which I'll mention when we discuss some of the other options. In many areas, patients might not have easy access to clinicians with bone anchored hearing device experience.

They may need to travel very far to a location, a clinic to receive care for this type of device. I do believe that this is improving over time, but it is something to consider if you have a patient coming from a very rural area with less options. So this is a hindrance and it should be considered when selecting a device

for the patient.

Let's take a look now at a case study for a pediatric patient we'll first meet, who we will call Ari. Ari was diagnosed with SSD at only seven weeks of age. A diagnostic ABR was performed following a failed newborn hearing screening. That ABR revealed normal auditory function in the left ear and a no response at the limits of the equipment ABR in the right ear and you could see that Ari had normal tympanometry in both ears and the ears were clear. But as was protocol at this facility, Ari was evaluated by an ENT physician subsequently after diagnosis and then underwent imaging.

And the results of the imaging revealed an absent right cochlear nerve. So that explains the hearing loss. Ari had no relevant family history and was born full term without complications. So diagnoses like these for a very young infant are always very surprising and sometimes upsetting for families as they had no indication of this hearing loss or any issues up until this point. At this point, we began to discuss some treatment options with the parents of Ari.

Because there's no cochlear nerve, a cochlear implant is not an option. And due to the patient's age, something like a cross device would also not be an appropriate option. The options presented to Ari's parents were a bone anchored hearing device on a soft band or to wait and monitor Ari's hearing as they progress to see how their languages, how Their language development progresses and their auditory development progresses.

This particular family was very highly motivated to pursue specifically a cochlear baha. They had done some research and brought this to us as what they wanted to pursue next. So in further assessment of Ari's candidacy for this particular device, we did have the parents complete a qualitative measure in conjunction with our quantitative measures. And this was known as the little ears. If you've never completed it, this is a way for us to find how Ari reacted to different auditory situations and stimuli at home from the parent's perspective.

And the results of that questionnaire indicated that Ari was not doing very well in comparison to her normal hearing peers and that ARIA might benefit from amplification in the form of this bone anchor device. So we proceeded with ordering at that time a VAHA 5 on a soft band. And Ari was fit with this device at about 13 months of age. In our clinic, we typically waited to fit these devices until the child is old enough to have some good head, neck, and trunk control. That way, they aren't consistently leaning against a surface where the BAHA might be up against something, creating feedback and not providing much benefit to Ari.

So that's why we did wait a bit to fit Ari with this device. In addition to their new device, Ari began receiving hearing support services at their home through early intervention about two times per month. These support services, we've found, can be especially helpful for families that are implementing a new device, like a bone and cared hearing device into their child's routine, because that can be pretty overwhelming if you consider placing a soft band, a headband that goes all the way around the head on an infant or toddler, and keeping it on them can be very challenging. It can be very frustrating, and we're asking the parents to keep it on them pretty consistently throughout the day. So learning new strategies from these early interventionists has been really invalu valuable to many patients that I've worked with.

In the case of Ari, the family reported really positive results. At first, Ari was tolerating the device. They noticed an increased responsiveness to sound. This was great. However, Ari later began exhibiting some sensory behaviors that warranted a referral to a behavioral specialist.

And later Ari was diagnosed with autism spectrum disorder. Ari then began to tolerate the device less and less. And keeping the BAHA on her head was ultimately too much for the family to continue working on when there were so many other behaviors that they really needed to focus on at that time. And the decision was ultimately made to discontinue the use of the BAHA and To continue regularly

monitoring the hearing of the better ear and Ari's progress. Unfortunately, we didn't see the family as often as we would want to.

But we are hopeful because Ari is receiving occupational therapy, physical therapy, speech therapy, hearing support, and ABA therapy regularly. So we're hoping that she begins to follow up as she grows.

When looking at the patients in this particular clinic over time, a bone anchored hearing device is the least common selection compared to other treatment options that we can offer. Actually, only about 5% of our patients with SSD were utilizing a bone anchored hearing device at the time when the presentation was created. Why such low adherence to a bone anchored hearing device in the pediatric population? For one thing, I think we know that hearing aids are hard to keep in the ears of a young patient, an infant or a child. And you can imagine that being able to pull off a headband that has to be pretty snug against their head would be an easy thing for most children to do.

And it can be very difficult and frustrating to have to continually put that back onto their head. Also, children who are active feedback can be common if they're wearing a softband device and it's consistently coming off of where it's supposed to be sitting on their head. So for these reasons, I think a lot of families aren't interested in the bone anchored hearing device, especially when we consider that it's helping with audibility, but it's not giving the patient much else in terms of localization or binaural hearing.

So let's now think about the CROs Device. So the CROs, or contralateral routing of Sound device, is a system where the patient is wearing two devices, one on each ear, typically a receiver in the canal style hearing aid. The device on the poorer hearing ear is not sending amplification into the ear for a cross. Instead, it's routing the incoming signal to the better hearing ear. And this configuration provides the patient with awareness of sound from the poor hearing ear side.

And while this can improve audibility, again, it's not going to improve localization and it's not going to provide the patient with true binaural hearing. It might be a little easier to access as most clinics, most audiology clinics will have access and experience to a CROs system. While a CROs might be an excellent option for many pediatric patients with ssd, it is important to consider the patient's age, their maturity level, and their support system. As the device is sending over any signal picked up by the poor hearing ear side, the patient must ensure that their poorer ear is not oriented towards a noise source. So for example, a child with ssd, if we fit them with a cross for hearing loss in the left ear ear and they're sat in the classroom with their left ear facing the H VAC system or a noisy classmate, they're just going to have noise routed into their better hearing ear and it might be a negative effect overall.

Additionally, crass devices are usually a RIC style like I mentioned, which can be fragile compared to a bte. So we need to make sure that that child is going to be able to handle that device. So as with most decisions we make with our patients, this should be on a very patient to patient basis. But personally I found waiting until age 6 or 7 years would lead to the most successful results for our cross patients.

The first patient that we will talk about here is Ty. So after failing his newborn hearing screening in the left ear, a diagnostic AVR was performed and Tai was found to have a unilateral severe sensorineural hearing loss and normal hearing in his right ear. Ty had a number of other symptoms and features that were concerning. He underwent testing and was later diagnosed with CHARGE syndrome. At first, Ty was fit with traditional amplification in his left ear in the form of a behind the ear hearing aid and an occluding ear mold.

But as we monitor Ty's hearing over time, the hearing loss in the left ear soon progressed to a profound hearing loss with thankfully normal hearing in the right ear still. So because of that, Ty was no longer benefiting from his hearing aid. But he was really a bright and motivated kid. He wanted to hear better, he wanted a new device. So we began exploring some of our other options.

Ty's family was very interested at first in a unilateral cochlear implant. So Ty underwent imaging to assess his candidacy and unfortunately he was found to have a severely hypoplastic cochlear nerve. So cochlear implantation was too risky. It was possible, but we weren't sure how he would perform and ultimately the decision was made to not recommend a cochlear implant for him. Instead, we decided to try a cross system and we dispensed this to Tai.

At six years of age, Ty adjusted really well to the cross. His wear time was high. His family was pleased with his progress. At one of our follow up appointments, we completed the BKB SIN to assess Ty's performance and noise both with the cross and without the cross. So without the cross, ty had a 7.7 DB SNR loss which when we compare to his normal hearing peers in his age group, he had a moderate SNR loss.

When he did wear the cross and completed the test, he performed with a 4.7 DVR DB SNR loss, which puts him at a mild SNR loss comparatively. So that's a nice quantitative measure for us to compare and continue to perform as Ty gets older.

So Ty was doing great. But as I mentioned, across might not be the best option for all SSD patients in the pediatric realm. The decision to pursue this device should really take into account the patient's age, their level of responsibility, their ability, also to figure out how to use the cross, meaning how to position themselves directly in the presence of background noise. And clinicians should also strive to measure the benefit of the cross using a combination of qualitative measures and quantitative measures. Finally, this is a great opportunity for clinical audiologists to collaborate with educational audiologists to ensure that our patients who have maybe more complex hearing devices are getting the support that they need in the classroom and making sure everyone understands the device that the child is using.

Our next treatment option to discuss is a cochlear implant for ssd. So from my perspective, this treatment method is becoming a lot more popular over time, and users of this method have the

opportunity to gain back improved audibility, localization, and true binaural hearing. Additionally, I think when we consider ease of access here, there are more and more cochlear implant centers. So I do believe that the access is improving over time depending on where the patient is located.

So our next case study is a patient named Riley. So Riley initially passed her newborn hearing screening and her family had no difficulties in early childhood. She was developing speech appropriately, they didn't have any hearing concerns. But at age 5, she underwent a regular hearing screening at school and she failed in her right ear and passed in her left ear. So she was referred to our clinic for a more diagnostic evaluation.

So the results of that initial evaluation are shown here. She had normal tympanometry, but then we found a profound hearing loss in the right ear and normal hearing in the left ear. She also had absent reflexes and dpoes in the right ear. And it's important to note she was a very consistent. We didn't have concerns for her reliability.

So she was referred to an ENT physician who suggested imaging and she underwent imaging which was unremarkable. This was, as you can imagine, a big shock to the family who didn't have any hearing concerns before this. And really there were no obvious indicators of the hearing loss before the school screening. So it's unclear when Riley's hearing loss began. She obviously became very good at compensating, which leads me to believe that this might have been around for most of her life.

But we'll never know for sure.

Riley's family was very eager to get some type of device on as soon as possible after discussing our options.

And even though Riley wasn't struggling, I think their eagerness was to prevent any delays in the future, which I understand. So after we weighed our decisions, they decided to pursue a trial with a cross system for Riley. This was dispensed at age 5 years, which is a bit younger than the typical age I would fit this device. But in Riley's case, she was very responsible and we felt confident that she could handle this. And she also had really strong support and motiv motivation both from her family at home and her teachers at school.

So she was in good hands. We gave her the cross and Riley was doing great. She was really a rock star with her cross. She reported it was easier to listen in the classroom and at some of her follow up appointments. We performed to the BKB SIN in the unaided condition.

She presented with a mild SNR loss compared to normal hearing peers. But when she was aided, she was able to score in the normal range, which was very exciting. Although this seemed to be a great fit for Riley, a great solution. Her parents were very interested and persistent in pursuing a unilateral cochlear implant for Riley. And I think that for some families they feel that maybe doing the most, the biggest thing like a cochlear implant compared to just across will lead to the most benefit.

So this is where counseling became really important and kind of a challenge for this particular case. But we did begin to pursue a workup to see if Riley might be a candidate for a cochlear implant. We did several qualitative measures to assess both motivation and candidacy.

Although Riley did end up being a candidate for a cochlear implant, at the time it was very difficult to get this through insurance. We had two denials before we were finally able to have the surgery completed at age 7 years. The surgery went very well. She had a full insertion. There were no anatomical abnormalities noted during the surgery.

The cochlea looked normal from a surgical perspective. It went really well. But Riley had a very difficult time acclimating to her unilateral CI. She had a consistently or low wear time and then she began. Her parents began to follow up with us less and less.

So at one point we were able to complete A BKB SIM when she was utilizing her CI and her results weren't as good as her cross results, which isn't a surprise given that she didn't give. She wasn't acclimating or wearing this new device consistently. So when we think about Riley, the cross served as a really quick solution that she could easily adapt to. In comparison, a cochlear implant was going to take time and effort and we aren't sure about the duration of deafness for her cochlear nerve. If the hearing loss had been present for most of her life, it might have increased the difficulty for her to be able to transition to this device.

So the last patient that I'd like to talk about is a patient named Ellie. So Ellie is a very medically complex kiddo. Within the first 24 hours of her life, she endured a left hemisphere stroke and multiple seizures which resulted in significant brain damage and delays both physically and cognitively. She did not pass her newborn hearing screening in the left ear and was referred for diagnostic abr. And at that time, the ABR found normal auditory function in the right ear and a no response at limits of the equipment in the left ear.

So considering Ellie and her needs, we have a lot of discussions with the family and there was just so many other things going on with Ellie that the parents needed to focus on, like learning tube feeding and being in and out of the hospital really consistently. And because of all of this, the decision was made for us to continue to monitor Ellie but not introduce any type of device into her life at this time, which I feel like was a very appropriate decision for this case. So that's all of my pediatric cases. I would like to now turn it over to Dr. Milne.

Thanks, Melanie. If anyone has any questions about any of those pediatric cases, absolutely put questions in the Q and A and we will address those towards the end, depending on how much time we have. I always like when I'm presenting with one of my pediatric colleagues to use this opportunity in the transition between pediatric and adult care to talk about transitioning from pediatric to adult care and really how to best practice handle that topic. Special thanks to Sarah Meyer, who is the student who created this handout on secondary transition that's included on this slide and who gave us permission to use this. We really work with our pediatric colleagues closely, particularly with SSD cases, because these are such complex cases in some cases that it is really incredibly important to make sure that they continue to get the care they receive, be they a cochlear implant osseointegrated device or a cross patient, they're certainly having more complicated devices, more complex needs than some of our more typical patients.

So in these cases, it's really nice to provide a nice warm handoff that can be sending an email or a phone call, making sure that the patient and the facility, they're going to have all the information they need about the various devices and what audiometric testing looks like, as well as I think a great example is a case that I've shared with some of my children's colleagues in that they are a teenager with a CROs device that we see regularly in both the pediatric and adult facilities here. And they go back and forth because this family is very, very motivated and financially able to provide them with very current cross systems and always wants the newest, most updated technology because she uses her CROs system for 18 plus hours a day. So they want to have backups and backups upon backups. And so they go through our children's facilities for, for care when they are using their insurance, because in the state of Pennsylvania, medical assistants will provide hearing aids for those under 21. But when they are out of pocket buying a backup, they will go through our adult facilities because the pricing is just a little better that way.

So I see them when they're in the adult facility, and some of my children's colleagues see them when they're in the pediatric facility. And this is a great transition system because they're already well aware how to see adult audiology services. And especially in the state where we live, because there's such good coverage for pediatric patients, sometimes easing into the adult transition is rocky and families are unaware about the costs associated with things because they've never had to pay anything before. So making sure people are aware of those things is really helpful in our case. And SSD in adults is different in many cases than it is in pediatric cases.

Certainly those pediatric cases grow up and become adults with ssd. But for adults that develop ssd, it's most likely to be caused by an idiopathic sudden sensorineural hearing loss. And about 25% or so of the adults report that they do fine without really any intervention. They have good or excellent hearing. And those really aren't the people who are seeking out our services.

And it's about 350,000 people in the US that have SSD. So it's a relatively minor amount of the populations that we are seeing. And I'm going to go through three different cases, all using pseudonyms, and this first one we're going to meet is Heather. Heather is a 20 year old university student who came in to our ER initially reporting a very sudden change in hearing. The ER promptly referred to ENT.

We got her in very quickly within a few days of her developing this hearing loss. At that visit she had an audiogram and she had already had an MRI in the ER and the MRI was completely unremarkable. She's a typical 20 year old, so her medical history is very unremarkable and she is reporting dizziness and tinnitus. She and is really struggling and very distressed by this sudden loss that she's developed thanks to being 20. It's the most classic single sided deafness audiogram of all time.

One beautifully normal hearing ear on that left side and a very profound loss on that right side. She was given high dose oral steroids and transtympanic steroid injections in our otology clinic. But despite all of

that treatment and despite really early intervention, nothing changed in terms of her audiogram. Our otologists are very well informed and did discuss all of her options available to her. And she ultimately scheduled to come in and talk to audiology.

While talking with us we learned that her listening needs are really typical for a 20 year old. She is in lots of noisy social situations. She is in college at one of the universities here, local to us in the city and subsequently is walking around the city and a busy city campus where there is a lot of traffic and a lot of pedestrians and definitely safety is a very reasonable concern. So while she was consulting with audiology, she did try a CROs system. The CROs system was, as all are in our clinic, verified using some probe tube measurements.

And even with that nice fitting of the cross, she really didn't notice significant benefit after trying it for a few weeks. So she decided to come in to discuss doing either an osseointegrated device or a CI with our otology. And after discussing those options, she decided if she was undergoing surgery anyway, that she would like to have the more pros that come with a cochlear implant implant. And she pursued a cochlear implant candidacy evaluation with our clinic. And I will give the caveat here that I am not a cochlear implant audiologist, but she was considered by both the otologist and our audiology team to be an excellent surgical candidate meeting the FDA SSD criteria.

And also they thought she would do very well with a cochlear implant given the relatively recent experience she had with sudden loss. This was within months of her experiencing the sudden loss and given her young age and motivation, they thought she would be a very good candidate. We ran into some significant complications in terms of getting approval for this surgery. The insurance company really heavily fought this. They really didn't think they should have to pay for it.

And ultimately we had to appeal it three times, including the otologist doing a peer to peer appeal with another physician. And in that process, the family actually decided to schedule surgery anyway and that

they would pay for it out of pocket. Her grandparents actually took out a loan to pay the very significant down payment on the self pay rate to make this possible for her. So clearly this family is very motivated for her to get the best possible pair. But thankfully, three appeals later, the decision was reversed and the insurance company did finally agree to pay for the surgery.

She did well with the surgery. There were no complications. And ultimately on her activation day, this is what her results looked like. She was very happy to have preceded this and was getting a lot of support in recovery from her very involved family. And they were really specific about when they wanted to schedule and do her follow up because they were trying to do it over her summer break from university before she went back to school so that we could start this process and get her fixed up.

Because she's not. Her home isn't local to us, but her university is. So they wanted to time it with the school year and make sure she was getting everything she could out of her classes as well. At her three month follow up, she reportedly was doing very well. They only had to adjust the magnet strength a little bit.

Everything looked good, she was definitely improving. But it was really remarkable. By the time we hit her six month follow up, she really loved that she had seen a participant on the Bachelor who had a cochlear implant and really felt engaged by seeing a younger person out in the real world with a cochlear implant. And at this point we viewed it as just putting on her contacts in the morning that this wasn't any more complicated than that. And she really felt like she was receiving a lot of benefit.

And the testing showed that this was definitely worthwhile for her. And in this case, motivation and family support mattered so much. She really benefited from having a very supportive family and by moving so quickly through the process that she went from sudden loss to implantation within the matter of six months and at this point is doing really well. We have talked with her about different educational accommodations through the office, University Office of Disabilities, but she hasn't pursued that at this

point in time because she's doing so well with the cochlear implant. Even though we've encouraged that she could get some accommodations, she hasn't wanted to identify with the university at this point in time.

So then we're going to go on and meet Tracy. And Tracy is one of my favorite patients and a little bit of an adventure. She is a 61 year old female who came to see me and one of the general ear, nose and throat physicians that I work with in our clinic after a hospitalization for lower leg sepsis. This was a very severe infection that was ultimately treated with Lasik and vancomycin in very high doses intravenously. And she didn't notice anything in the hospital.

She did not seek out our services while she was an inpatient, but did notice that once she was discharged she was experiencing some more right sided hearing loss. And but at that point in time she was still recovering from her hospitalization, still recovering from the infection and didn't really do much about it for a little bit here. So two months post hospitalization and post her hearing change, she did come in to the ENT clinic and was evaluated by myself and the physician and this is what her audiometric testing looked like. So for her left ear isn't totally normal, but is really pretty close to normal. And if both ears looked like that left ear, she realistically wouldn't be seeking treatment from us in any way, shape or form.

So she instead was having real difficulty with that right ear. And her word recognition scores are beautiful in that left ear, Perfect and then 0% in the right ear. So it was felt that she really needed to look at the other options from the ear, nose and throat standpoint. She was cleared for to talk with us about all her device options. So she came in and talked to me about a CROs system, about osseointegrade devices and about a CI.

And what we found in that appointment was that her listening needs were relatively basic. She wanted to hear her family members better in like little group conversations. She was struggling in that situation.

She lived alone and had some significant safety concerns about the area she lived in. So she wanted to make sure her hearing was as good as it could be and that she was getting all the input she really felt like she needed.

And she's a dog foster mom, not this size of dog, nice little dogs. And she is concerned that she's not hearing them well to be able to take the best care of them. There's a lot of dogs under her care usually and she wanted to make sure that she could hear from both ears so she could figure out what was going on with them the best she could. So we talked about her different treatment options and she really did not want to be in the hospital anymore. She did not want surgery.

She did not like any of the surgical options in terms of an osseointegrated device or in terms of a CI that while she thought those sounded great in theory, she had had enough hospital time, she was done with that and did not want to have any option that involved being in the hospital anymore than she absolutely had to. So she was really motivated to look at a CROs system and to really understand that. We talked for a very long time about the limitations of this, what it could do, what it couldn't do. And another plus here was that she had very good insurance coverage for hearing aids, so she actually wasn't going to have an out of pocket cost to try that option and ultimately decided to go that route. We did talk about some of the things I traditionally talk about when choosing a CROs system with patients is battery life and app compatibility.

And she was not a device person and really didn't care in her case about how the app worked, what app it was, any of that. She did not need or want any of that and didn't feel like those were the things she struggled with. So we didn't worry about that in her case. But certainly something to consider with most of our patients is how does this app work? Does it work with the CROs?

What can it do? What can it do? And battery life. She was really concerned, particularly with the dogs, that she would be wearing this device for a large period of the day and she wanted to make sure that

her battery life would last and she wasn't going to be in a position where she could get a backup device or anything like that. So she ultimately made the choice to go with disposable batteries still so that she could ensure that she was getting a full day of use out of things.

But some patients may really want a rechargeable or be in a position where they can have a couple sets of devices or a speed charger. And rechargeable might be more of a priority if they're trying to make things a little easier to use or really not a person who can operate the childproof battery packaging. Tracy was really helped by motivation and realistic expectations. It was abundantly clear the priority here was not a surgical option and she was ultimately happy with this. When she came in for her fitting, we did do real ear verification with her and on follow up, she clearly reported that this met her listening needs and that she felt like she was doing better and was ultimately been very successful with these devices.

My last case is going to be Paula. And Paula has had a long standing sensorine hearing loss since childhood. They are not, she is not sure what caused it. They are no remarkable otologic symptoms as far as we could get in the medical records. Given that she's a 50 something year old adult, we couldn't figure out if there'd ever been imaging.

She wasn't the most accurate reporter and if there had been imaging it had been done a long time ago. She does understand our world a little bit and works as an ASL interpreter. So her hearing is actually really important to her so that she can interpret accurately. And that was a key motivation at the point in time where she started to move forward in the process as to her moving forward because she felt like she was struggling in her work environment. This was the audiometric testing from 10 years ago.

She was originally seen in one of our outpatient clinics that's about a couple hours away in a very rural setting. And she didn't have as much access to care at that point in time and didn't have the time in her life to be traveling farther for care. So this is what her audiogram looked like at that point in time. She

had. They could not test word recognition score which is why we would consider this a single sided deafness case.

And she really wasn't noticing significant difficulty on that right side or really experiencing much in the way of hearing loss on that right side side. So 10 years ago she considered what to do. It was 10 years ago. So a cochlear implant for single sided deafness was not anywhere near as common or as popular as it was today. I agree with Melanie that that is certainly becoming more and more popular.

So she really debated a cross versus a Baha. And I will say probably more of our adults start with a cross than anything. And in this case one was demoed for her in the office as was a Baha demoed on a soft band in this case. And the patient really felt like she performed better with the Baha. She was able to take a softband Baha home and especially felt like she did better in noise than she attempted to.

So she actually at this point pursued a really traditional Baha with an abutment and surgery went well. This was done out in our the local hospital connected with the outpatient facility. So it was a smaller surgery center with general ents performing the surgery. But it went well. From the records we could gather and was ultimately successful with the BAHA for that period of time.

She did end up showing up in our otology clinic in the present day. So about a year or two ago, and she was reporting really significant issues with her BAHA abutment. She was experiencing really significant pain and discomfort and was really starting to be bothered by the crusting and everything she was experiencing. She reportedly had been doing well and hadn't had these issues for probably the first seven, eight years that she had the device. And right at that seven, eight years post implantation mark, she really started to have some significant issues with her abutment and came into our highly specialized otology clinic to talk about her options.

And she talked with otology and audiology and we considered all of the options available to her. She really wanted to stop having the abutment and was bothered by the post at this point. So she was really looking at either a CROs or an ossea device and was not interested in the more extensive surgery of a cochlear implant at this point in time. So she ultimately decided to. After we did a new audio and really evaluated everything, she ultimately decided to go with and ossia and she wanted the post out of there, but really felt like she overall did better with a bone conduction system compared to a cross system.

And she felt like the benefit she received was significant enough to be worthwhile having the ossea implanted while they also surgically removed the BAHA post. So they did that all in one surgery. They removed the post, switched her to the osteo, and that essentially eliminated all of the issues she had been having with infection and discomfort. And she really felt like this was a significant improvement for her. That a bone conduction system was definitely, in Paula's case, a personal preference.

But that comfort really played a very significant role here in terms of why she made the choices she made and in this case, why she made a switch from a tradition, more traditional BAHA to the Asia. And that was a change. Over time, it was a priority for her for her hearing to be as good as it possibly could be, given her profession as an ASL interpreter. And she felt like that was best achieved for her by using a bone anchored device. And in her case, she also reported regularly to otologists that she was very glad she made the two hour drive to come in and see us and get some improved treatment outcomes and the best care possible, because an osteo was not something she could get closer to home, that they were.

The ents she was seeing were doing BAHA surgeries at one point in time. But they had not moved to doing the slightly more complicated osseous surgeries. So how do you solve a problem like single sided deafness? As you can see from all of the cases that both Melanie and I presented today, so much of this was all related to patient and family centered care and setting realistic expectations and being

very clear and upfront with these patients in terms of what we can do, what we can't do. And I will say, as someone who does not provide all of these service options, personally, it really helps to be familiar and keep up with courses like this, to be familiar with all of the options out there.

I am upfront in the fact that I am not a cochlear implant audiologist, but it really helps to talk with my colleagues who do that to be aware of what the current criteria are and know when to refer. And knowing the people in your local community, even if you're not in a clinic that provides those services, knowing where you can refer for osseointedegrated devices, if you don't provide those services for cochlear implant devices, if you don't provide those is really important when you start seeing these patients in practice because these are a little more complicated and take a little bit more decision making on the patient's part because there are more options than your traditional hearing aid patient. We created this handout that we use in our department that one side is the information you see here with some resources and sort of a pros and cons chart we created. And then the other side has pictures of devices, some information on pricing and insurance and those sort of things. And we give this to patients in otology clinic when they're diagnosed with single sided deafness.

And we also give this to them when they come in to have discussions with our audiologists to make sure that they can look into things and do the research they need to ultimately feel successful and make the appropriate choices for them. So now is the point where Melanie and I are going to answer some questions. And Melanie, actually the first question we have is for you. So for Ty's case, would a BAHA device be another option for him? Yes, it definitely would have been an option and it is one that we brought up with the family and discussed.

But when you compare the style that he would need to wear the Baja compared to how small, light and discreet the cross system was, that's why in Tai's case he was more interested in the cross. Additionally, because of Ty's diagnoses, aside from hearing loss discharge syndrome, he had some

abnormal anatomy. So A surgical Baha. We weren't sure of how well that would, that would go. So he would need to be wearing a bone anchor device like on a headband or a soft band.

So it wasn't aesthetically or as comfortable as a cross in his situation.

So our next talk says first, hi and thanks for the excellent talk. And they wanted me and you to talk about how to evaluate a cross with real ear measurements, with pediatrics and with adults. Do you want to start with what you guys do in pediatrics? Yeah, I think it's crucial. You should always be verifying your cross.

And depending on the equipment you have, there are great resources online. So for example, if you have like an audio scan verifit, I know that they have videos available to you. It's very quick and easy and you should be really, you should really be verifying your cross systems. And I know that I pulled this up. There is an audiology online talk that's titled Cross by Cross fitting and Verification.

That was done by someone from Audioscan. And then if you have like an interacoustic device, I know that the interacoustic website also has some great videos to demonstrate that for you there as well.

And we definitely do this in all of our adult fittings. I would be remiss in not saying that, particularly based off of who my boss is and where I work, that we are definitely verifying all of our cross systems. And it's truly other than remembering how to set it up and make practicing and making yourself comfortable with the setup, it is no trickier than doing your standard probe tube measurements and takes no extra time.

We got some feedback in the Q and A that they loved the handout and the chart and said thank you for that. And then we have one last question. That is, if a patient is bothered by tinnitus in the hearing loss ear, what role does that play in your decision making? Is that something you guys factor in with

pediatrics or hear much about? Melanie?

Me personally, I didn't know. But I do know that if there's a really debilitating unilateral tinnitus case, that might be a good discussion when thinking about a cochlear implant, as some of those patients find relief after cochlear implant surgery. Yeah, I think that's certainly something we consider here as well. We also will engage some of our tinnitus specialized colleagues to figure out what the best plan is. And sometimes we'll proceed with whatever the preferred treatment is.

And in addition, add in some counseling services and some of the materials that are provided in our tinnitus and tinnitus retraining clinics as well.

And that was actually all the questions we have in the chat currently. Melanie, do you have anything you'd like to add? I don't think so. Thank you. Yeah, I think.

Thank you for presenting with me today. And we do have some references that we shared for everyone that are available as one of the handouts, and all of those were used in our talks.

Thank you, Dr. Lutz. And thank you, Dr. Milne. This is just a reminder for anyone who wishes to earn CE credit for today's presentation just to complete the multiple chicks exam that populates 10 to 15 minutes once it ends.

And we appreciate your time. Thank you so much for joining us today on Audiology Online. Have a great day.