Grand Rounds - Unique Patient Presentations, in partnership with The Ohio State University

Presenters: Gail Whitelaw, PhD, Emma Canino, BA, Dana Hamed, BA, Jaelyn Jaquay, BS, Liam Smyth, BA, Madison Pollock, BA

Hello everyone, my name is Carolyn Smaka with Audiology Online. Just going to give a quick intro today so we can turn the microphone over to our presenters. We're very excited to have back with us Dr. Gail Whitelaw and students from the Ohio State University to present a Grand Rounds format unique patient presentations. We've been doing this for the last several years and not only do I get excited by all the learnings they share with us, but also get excited about the future of Audiology by that brilliant and amazing students that come forth from the Ohio State University. So at this time we'll just go through some quick housekeeping items.

If you need anything before during the webinar, just go ahead and type in the Q and A. Also, we'll save some time for questions today. And last but not least, if you're earning CEUs, make sure you log into your account on Audiology Online and complete the CEU exam. It does expire, so. So make sure to take that exam to earn CEUs and thank you for your patience.

Now with that out of the way, I'll turn things over to Dr. Whitelaw. Thank you, Dr. Smaka. I appreciate the invitation for Ohio State to participate in the Grand Rounds process again this year. I think that every year we challenge our students to go out and find interesting and unique cases and every year they seem to top what was happening the year before and, and we have found that again today. I think you'll be really excited about the learning that comes about.

One is that we have no disclosures for today and I have a disclosure but no one else does. I work for the Ohio State University and there's the disclosure information right there.

And then we're going to talk a little bit about limitations and risks and you can read those for yourself that are on here and also learner outcomes. And these are things that we hope that you'll get from today's session and will give you a really excellent continuing education opportunity. Maybe to think about cases a little bit differently, maybe to think about some things that you haven't exposed been exposed to before. That was true with me with these cases as I was reading over them. And with no

further ado, I will introduce our first speaker who is Emma Canino.

Emma is a third year Doctor of Audiology student at the Ohio State University and she's going to talk to us about the balancing act and a unilateral hearing aid fitting. Take it away, Emma. Hi everyone, My name is Emma Canino. I'm currently a third year AUD student here at the Ohio State University. So like Dr. Whitelaw said, I will be talking about a case that I like to call the balancing act in a unilateral hearing aid fitting.

All right, so a little bit for case history. This was a 54 year old man with a unilateral conductive hearing loss in the right ear. He's had this since childhood, likely due to ear infections and PE tubes over the years. He was medically cleared. The CT scan showed thickening of the right TM with no other explanation for the conductive hearing loss and the left TM was within normal limits.

No other suggestions with the CT scans. Everything within normal limits. The patient did not want surgery and ultimately the ENT did not recommend surgery. A significant aspect of this case is the duration of time it took for the patient to investigate non surgical options for his hearing loss. His pursuit of hearing technology was significantly delayed which appeared to be due to inadequate counseling on the potential benefits of amplification.

So he was then referred to us by a faculty member.

He was then referred to us by a faculty member by in the department who briefly discussed potential benefit. Some other key aspects of the patient's case history was his reported long term difficulty in group situations and background noise, along with his need to put his phone up to his typically functioning left ear. These descriptions all align with typical unilateral hearing loss complaints and difficulties.

So then this was the audio that was obtained in 2024 from the ENT practice. A hearing aid consult was then completed with us where we discussed the audiogram and hearing aid technology options and the patient ultimately selected an advanced level RIC with an embedded receiver and a custom acrylic ear mold with a small vent. This custom ear mold was selected with the goal of occluding the ear sufficiently to keep the low frequency gain in and directed towards the TM for sound transmission. So another part of this is that this is a unilateral hearing loss. We know when fitting a unilateral loss this is going to be different than a bilateral fitting.

They will only be receiving the one hearing aid. So it is crucial for us to help restore the benefits of binaural hearing. We do this by making sure that both ears feel balanced and that the ear with the hearing aid is not overpowering the typically function functioning left ear. We are working so hard to feel balanced so that he can receive benefit from binaural integration. Binaural integration is where our brain merges information from both ears at the level of the brainstem.

We need both ears to help with localization speech and noise and reducing listening effort. These were the patient's main subjective difficulties, which are cues that heavily rely on two functioning ears or in this case a hearing aid ear that feels balanced and aligned with his left ear. Another aspect of this is that this is a conductive hearing loss. So we know these patients have a good working inner ear system, meaning they still have the full dynamic range available to them in comparison to a sensorineural hearing loss with a limited or reduced dynamic range. So having the full dynamic range available in the full frequency range intact helps us when we go to fit an individual in the hearing aid software.

A conductive hearing loss more so just needs a prescriptive method that gives them a boost to overcome their conductive hearing loss. And just as a reminder, both NAL NL2 and DSL targets are made to incorporate the conductive hearing loss as long as you put in that boneless line in the

software. So it is just important to recognize the management and treatment of a unilateral hearing loss in that it depends not only on the severity, but largely on the impact it has on someone's quality of life.

So then we went ahead with the hearing aid fitting. So we repeated the threshold since his last audio was outside the six month window. Thresholds remain stable since the last audio which was great. So started off the appointment just asking what his goals were. He stated he wants to hear better in noisy situations like in meetings, continue to enjoy music environments like his son's piano recital and not needing to turn his head to the left, which is his better ear.

So prior to the appointment we did pre program them or I pre programmed them to and set them to acclimatization level three to begin with. Then we went ahead and tried the right hearing aid with the ear mold on for the first time, which revealed good retention and a comfortable fit. The acclimatization process, when to use the hearing aid, when to not use it, was discussed with him after. So after listening and discussing all these things with him and with these settings for a bit, he did report that the hearing aid was too loud and that he would turn it down. We then ultimately led to switching to acclimatization level 1, but he still felt it was a bit too loud.

So all loudness levels across all frequencies were turned down by three clicks. He reported this was comfortable and that he wouldn't make any further adjustments. We also added a music program based on one of his goals and the rest of the appointment. We just practiced putting the right hearing aid in, charging it, volume control and Connected it to his phone. So at this appointment we didn't get to acclimatization level 3, nor were we able to complete the real ear measures at this time.

We obviously, when focused on evidence based practices, want to complete real ear measures and meet targets to the best of our abilities. But that doesn't mean it needs to be done immediately or at that very first appointment, which is totally okay. I think it's important to be flexible with patients and meet them where they're at. And with a unilateral hearing loss, it can be even more important with the fitting

to listen to how their perception is and if their ears are balanced or not.

So then with a follow up, this was the second appointment or our first hearing aid check appointment, which is what we just call it here. So the first hearing aid check appointment was a week after the hearing aid fitting appointment. The patient actually came to us straight away telling us that he wanted to increase the volume or increase the settings. He said that he was already doing that in the app and felt like he could tolerate the gain now. So then we set the hearing aids to acclimatization level 3.

We ran real ear measures to meet NAL NL2 targets. He reported these adjustments were enjoyable and he felt balance between the two ears. Still, he indicated he would not make any further adjustments, so no further adjustments were made. Our clinic likes to do at least two hearing aid check appointments after a new hearing aid fitting. So the final hearing aid check was completed by another graduate clinician.

But the notes just say that there were no further adjustments made. And now we just recommended he be seen annually unless any problems arise.

So to explain why we completed the hearing aid fitting the way we did, there are kind of two main things we utilized, which one was being shared decision making strategy and the other focusing on acclimatization level selection. So first I want to get into shared decision making. We want to meet targets on real ear measures, but at the initial appointment, if someone can't tolerate the gain, especially the patients who have had long term auditory deprivation like this patient, they may not be able to tolerate much gain at first. In many instances, a careful balance must be maintained between providing the patient with the appropriate gain and frequency response that will allow acclimatization to occur and at the same time avoiding hearing aid settings that discourage the patient from using their hearing aid. So this is why I always emphasize that the patient will have follow up checks and we can continue to work towards that and make adjustments.

So it's important to figure out what is tolerable for them so that they're actually wanting to wear the device. These ideas all encompass using a shared decision making style in counseling. So this article in 2010 examined patients experiences with shared decision making specific to rehabilitative audiology. They found two main themes from the interviews completed, which were my story and then trust. So participants wanted their experiences and preferences to be heard by the clinician and be incorporated in decisions made collectively.

They also wanted to feel like they could trust their audiologist and not feel like the audiologist is seeking compensation. So ultimately people just want to feel informed and involved in decisions about their medical care, which is why it's so important to use a shared decision making style that allows the patient to be informed of their options. And the audiologist can still tailor the options based on the patient preferences and current best practices. So counseling can really influence your ability to not only build rapport with patients, but also their hearing aid outcomes and their success with treatment options.

There we go. All right, so then to explain why we wanted to utilize the acclimatization process, we know that the majority of people experience some amount of acclimatization or adaptation to some aspects of amplification during the first few weeks of hearing aid use. Oftentimes we can tend to use the phrase don't worry, you'll get used to it after a while. But this may overestimate adaptation if it isn't programmed properly or to how the patient likes it and could lead to variation of different results. One being the hearing aid user does actually adapt or they are bothered by some acoustic sound but still wears it because they perceive a benefit, or the hearing aid user is still bothered by some sounds so they only use it in certain situations.

Or potentially the worst outcome could be they are bothered by the acoustic features and either returns it or keeps it and doesn't use it. So to help ensure the patient does adapt to device and actually wears

it, we need to meet the patient where they are at. So although prescriptive methods, real ear measures have been well researched and are believed to be to have a high probability of attaining a long term best fit for most patients, the resulting input, specific gain and output of these fitting algorithms might not provide the best first impression for the majority of patients. So keyword on first impression and many patients make decisions based on their early listening experiences with a new product and are not willing to use the hearing aids long enough to determine whether acclimatization will actually occur. So Mueller and Powers 2001 stated we believe that consideration of auditory acclimatization during the Patient counseling process and the use of acclimatization steps with prescriptive fitting procedures for selected patients will result in improved patient satisfaction with amplification.

Which just highlights the decision to use acclimatization steps for the patient's initial unilateral hearing aid fitting based on his subjective reports.

Right. So just some key points. Both I as the clinician and the patient were very happy with this unilateral hearing aid fitting that provided subjective benefit and helped address his hearing and communication goals. I think a large part of the success with a patient is implementing current evidence based practices, including a shared decision making strategy to help the patient where they are at. For example, current best practice encompasses utilizing real ear to include the patient's specific ear canal resonances and characteristics to meet their specific prescriptive targets.

And we used a shared decision making strategy and the research on acclimatization which emphasizes being flexible to meet the patient where they are at at that mom. With the appropriate amount of time, we were then able to conduct the real ear and program the hearing aids to evidence based prescriptive targets. And he was ready for this even only after a week after that hearing aid fitting. So another key point is that this is a unilateral hearing aid fitting and they are a balancing act. It's crucial to work with the patient to make sure things feel symmetrical between the hearing aid ear and the typically

functioning ear to support the benefits of binaural integration.

We also don't want to assume someone can't benefit from a device. So it may seem like, oh, he has a unilateral loss, he's got one good ear and it's only mild to moderate conductive hearing loss. No, we should think that everyone could potentially benefit and make sure we listen to the patient's subjective reports and how their loss affects their quality of life, since this often drives decision making and often their satisfaction. So based on all this, we give them informative counseling and realistic expectations so they know hearing aids or other non surgical strategies are options that they could pursue.

Right. And that's all I have. So thank you everyone for listening. I appreciate it. Thank you.

Emma, I think that you hit the nail on the head when you talked about don't assume benefit. And and we know that oftentimes people that come to us will talk about the fact that we assume that one ear is as good as two. And clearly that case shows that he was very happy with the choice that he made and the choice that you helped him make. So thank you for that. Our next presenter is Dana Hamed.

Dana is also a third year student in the Doctor of Audiology program here at Ohio State and she is a lend trainee for the 20262027 school year which focuses on interdisciplinary education and teaming. So I think that Dana's presentation is going to be very overarching for how we might work as audiologists, but also on a team in educating others. Dana hi. Hello everyone. My name is Dana.

My presentation is about a child with like cochlear hypoplasia, but I also wanted to touch on beyond the diagnosis and how to overcome language barriers and build cultural humility.

So to start off my presentation I wanted to discuss and understand what cochlear hypoplasia is and how it develops. So according to the article high resolution 3 Tesla magnetic resonance findings and high cochlear hypoplasia and incomplete partition anomalies by talenting colleagues, approximately

20% of children with congenital sensorineural hearing loss who undergo imaging are found to have an inner ear malformation. This development of the cochlea and other inner ear structures can be affected by a variety of factors, including genetic abnormalities as well as environmental influences during pregnancy and cochlear hypoplasia is a congenital malformation in which the cochlea is smaller than normal or underdeveloped. In some cases, other internal structures of the cochlea may also be affected. This malformation occurs during fetal development, typically between 6th and 8th weeks of gestation.

There are four recognized types of cochlear hypoplasia. Type 1 and Type 2 are similar and Type 3 and Type 4 are similar. Type 1 is considered to be the most severe and involves a very small bud like cochlea with no internal architecture. Type 2 presents with a small cochlea that has incomplete internal development, type 3 more closely resembling a normally developed cochlea but has a shortened modiolus and reduced size and finally, Type 4 is a rare form that often occurs bilaterally and is characterized by underdevelopment or absence of the apical turns in middle of the cochlea while the basal turns remain relatively normal. Understanding these different presentations is important because the degree of malformation can significantly influence hearing outcomes and the treatment options available to the patient.

Obviously, as audiologists we don't need to know the difference between type 1 versus type 2 versus type 3 and type 4, but we do need to understand how cochlear hypoplasia affects the patient's hearing and language development and that's when we would need to work closely with the surgeon and surgical team to figure out how severe their cochlear deformity is.

So there's a variety of treatments and management options for cochlear hypoplasia, and this just depends on the patient's needs. So one option is hearing aids, which amplifies sound and may provide benefit when there is usable residual hearing. For individuals with more significant hearing loss,

cochlear implants can be considered to provide access to sound by directly stimulating the auditory nerve. In cases where cochlear implantation is not expected to be successful, such as when there is a severe cochlear nerve deficiency, an auditory brainstem implant may be another option. Beyond hearing technology, speech language therapy and auditory rehab play important roles in helping individuals develop communication skills, listening abilities, and overall participations in daily activities.

Communication approaches are also an important part of management. Total communication incorporates multiple forms of communication, including speech, sign language, gestures, and visual supports. American Sign Language provides a complete visual language that can help support communication and language development and then cued speech using specific hand shapes and placements near the mouth to clarify spoken language visually is also beneficial for some cases. And then finally, some families, like the family that I'm going to discuss in a bit, may choose to emphasize on auditory, oral, or listening and spoken language approaches. Because outcomes can vary significantly among individuals with cochlear hypoplasia, management decisions should be tailored to the patient's hearing and status and it should be worked with a shared decision model between the audiologist and the patient or the patient's family, depending on if it's a child or adult.

And then lastly, realistic expectations and counseling should be taken into consideration when discussing various communication approaches and management options.

So this is my case. It's a case of a potential cochlear hypoplasia. We're going to refer to the patient as patient A. He is four years old and patient A was diagnosed with bilateral profound sensorineural hearing loss in June 2023 in their home country, Patient A was diagnosed due to other medical concerns and medical team had discovered the sensorineural hearing loss during this time. In April of 2024 he had an MRI and it showed a possible bilateral cochlear hypoplasia and his cochlea had disclosed had decreased turns.

With this being said, patient A has present cochlear nerves and an intact vestibular system.

In the spring of 2024, Patient A, who was 2 years old at the time, received a cochlear implantation out of state in the right ear. Post implantation follow up was on 5, 2. 2024 and he had moved to Ohio shortly after Patient A per the patient's parent report did not work CIS after implantation until patient A began school in fall of 2025. So we can see around a one year mark or half a year of no cochlear implant use or stimulation. September 2025 following up on the Implant center initial map with four progressive programs were done in present time.

Patient A has been through three mappings with four progressive programs each.

So what's the next step for patient A? How is patient A improving in school and language development? So as we can see patient A has a lot going on right? Didn't wear his right CI at home, lack of cooperation, complete aided testing which I'll show you guys in a second and per patient report difficulty following instructions, wearing their CI at home and it makes sense changes environment, moving to a foreign country. All of this makes sense why behaviors may be affected, especially for a four year old that just recently gained access to sound awareness.

Now when they moved to states for the cochlear implantation surgery and eventually moved to Ohio they joined the school which I received some of the results and was able to one of my placements there. We were able to work with the child and then he was seen to have very few ASL signs yet after attending school the current expressive vocabulary report is reported to be around 50 to 100 signs. We're able to see that this child is progressing with sign language and language development. Receptive vocabulary is slightly higher and patient A is currently putting signs together into two word utterances. The child is reported to be a bright child who retains new information well and really the only barrier to access to speech is the patient's cochlear anomaly and access to language prior to implantation as well as the cooperation to continue wearing the CI.

The child wears the CI the entire time when he's at school, but the parent does report that once he comes home sometimes he just can't have it on the entire time so he takes it off. So a lot of counseling has also went to talking to the parent and kind of just educating the parent on language development and the need to access of speech and sound.

So this next slide kind of just shows the different audios that were done over time and I can zoom in to these. So 9 29, 2025 we were able to see that there was no response with the CI except in one frequency. But in terms of the aided link sounds, they were able to get 70dB with E and 65dB at M. And then for a month later they were able to get 70dB with the link sound.

With a month after that they were able to find improvement. This was the child's second mapping. 70 decibels with the shape sound, 75 with the oo sound, 70 with e, 65 with m. And then there was still no response with the SH and sound and then with Progressive 2 on the second mapping, they were able to get aided results for all six ling sounds.

And then so on. We were able to see an improvement in thresholds with the aided ling sound. They were originally around 70db. Now we're getting 45db responses, which is amazing. And so on we get to see that improvement.

The times that we weren't able to get responses, it was just child cooperation and so on. We were able to see amazing results and progression as the child continued wearing his cochlear implants and as the mapping as he continued to get more mapping and progressive mapping done.

So when we're counseling the patient's family, and especially when we're counseling a patient with a language barrier, the patient's parent is still finding difficulty to accept that their child will require ASL and also various visual cues to communicate and thus will need to go through a total communication

model. The child is in a total communication model class and the parent is still struggling with comprehending this. He is consistently wanting his child to use oral language and progress in language development. Yet there has been multiple occurrences where either the surgeon, the audiologists, or even the teachers have continuously explained that he will require visual cues and sign language to be used as a form of communication. And this is just due to his hearing loss.

It's also due to lack of language access until around the age of 3 or 3 or 4. The critical window is during this time and we just want the child to have as much access to language as possible. And when the child's not wearing their cochlear implant until they reach fall of their school year, this becomes an issue. But also as much as they get language development, their cochlear anomaly is also an issue. Patient A's parents is continuously telling the child's teachers when will he be able to use oral communication?

And that is not what the surgical team had informed him. Communication back and forth between the audiologist and surgical team have made it clear that patient's a case is simply not possible to be oral language only when the patient's parents Talk to the surgical team, they speak using an interpreter to communicate. But how does one build rapport when using an interpreter and there's a language barrier. How does one address emotions and feelings and miscommunication and cultural beliefs and stigma? How do you know if anything is missing and being misinterpreted?

How do we overcome these barriers while also taking into consideration health literacy, especially coming from another country, they are coming from another country and kind of just trusting the medical system, having their child get different surgeries, different medical care. How are they able to completely understand what's going on when there's that language barrier? And how are we as audiologists responsible to build rapport with these patients and these patients families? And unfortunately that is not only difficult for a parent to grasp, but with a language barrier it becomes even

more difficult.

So how do we as a profession provide the best patient care that we can? So when we are putting ourselves in these parents shoes again, imagine you're coming to a foreign country for your child's medical treatment, distrusting a medical system that you're unaware of. And you kind of just need to see what happens. And in situations where you're explaining to a family regarding a cochlear anomaly and how total communication may be the form of communication that their child may need, if the patient's family might have a lower health literacy, they might not completely understand what total communication is. They might not completely understand what's going on with their child's cochlear anatomy and they might not understand how that cochlear anatomy might affect that child's language development.

And so when counseling a family, providing culturally sensitive communication, understanding that not everything that you may say may be taken lightly. And that's okay, this will not be the first nor the last time you will see or interact with this family and you can continue to check up on them and understand that they might not be accepting of the diagnosis to begin with, but we as a profession also need to start understanding and identifying those cross cultural barriers and acquiring cultural competency. And I'm not saying we as professionals are going to understand and be aware of all cultural beliefs, but having self awareness and kind of trying to push those biases aside while working with various families coming from different cultural backgrounds is going to be crucial to become an audiologist that has great patient centered care. An important component is using a certified professional interpreter. Smaller clinics may accept family members even though it's legally restricted in various settings and discouraged.

And thus you must enforce this rule. Getting a certified professional interpreter may Help with misinterpretation, using clear language, concise language and avoiding jargon. Since it has been noted

that there is various terms we use in English that might not be directly interpreted in a different language. And then Teach back counseling Teach back counseling is a type of counseling method that I personally like and would recommend, especially in this situation. Having the parent explain to you how the cochlea works.

So kind of explaining to the parent what's going on and say oh, can you explain to me what's going on? Are you fully aware of what's going on with your child's cochlear anatomy? Do you understand why your child might need to use this communication modality? Same way how we as audiologists when we work with hearing aids, kind of just showing them how to change the wax guard and giving it to patients saying can you show me how you change the wax guard? Same idea, but in terms of a medical aspect.

Having them explain what's happening to their child or what's going on is crucial for counseling and patient understanding. Patient centered care is also huge and important. Having self awareness and recognizing our biases and overcoming them is crucial. And with ethnocentrism, viewing the world with our own cultural lens is going to be a negative perspective to have when counseling a family, especially when they have different opinions than you. At the end of the day, it's impossible to have fully comprehending every culture and every religion.

But having cultural humility and continuously self reflecting, learning, acknowledging differences and biases is going to be crucial when working with different patients.

Lastly, why is this important to audiologists and healthcare providers? These are going to be the people you are serving in understanding how we can fulfill our duty as audiologists by helping our patients understand what their hearing loss or what their child's hearing loss means and the importance to access of language. But what is difficult is building that rapport with our patients when there's that language barrier such as patient A's case. Patient A's parent was unable to fully grasp why their child cannot use oral language. And that easily could have been due to misunderstanding of how the

cochlear works or why their child doesn't have access to language.

So using these various methods and counseling Diane mentioned is crucial to build a relationship with your parents while also helping your patients understand their hearing health care. And then. Thank you. Thank you, Dana. I think that, you know, one of the things we've heard from two presenters now is about shared decision making.

But certainly if we're going to look at patient centered care Being able to communicate effectively can be difficult enough in a situation where parents aren't familiar with terms like cochlea or they have expectations. But to not have that language background or someone who can provide interpreting for that information can be really, really difficult. So thank you for sharing that information. All right, we're going to introduce Jaelyn Jaquay next. Jaelyn is also a third year doctor of Audiology student at the Ohio State University.

And Jaelyn is also going to be a lend trainee in the upcoming school year. It seems to be a theme with presenters on Audiology online, and Jaelyn is going to talk about a couple of very interesting cases that she has had the opportunity to work with with a syndrome that you might not have ever heard of. So go ahead and take it. Jaylen. Hello.

Okay, so how I've heard it pronounced is Moon Syndrome. There's a couple different ways it can be pronounced, but that's how I'm going to go for it. So my case is Moon syndrome in the audiologic paradox when o o don't tell the whole story.

So what is Moon syndrome? And like Dr. Whitelaw said, you might not have never heard of it. It it's an autosomal dominant condition that most commonly is associated with chronal stenosis, cranial stenosis, and macrocephaly. So basically premature fusing or fusing at birth of the coronal sutures as well as other bones of the skulls, which leads to an abnormally large head. The estimated prevalence is

about 1 in 30,000 live births in the U.S. in addition to craniofacial differences, individuals with Muncun syndrome often present with high hearing loss.

That's typically a mild sensorineural hearing loss in the mid to low frequencies, as well as other developmental delays in intellectual disabilities. This can either be present at birth or can develop later in childhood. It's caused by a single defining gene, which is C749, and it's Proline to argonine amino acid substitution. So C to g in the FGFR3 gene, which is this is the most common syndromic cause of cranial stenosis as well. So why is this important audiologically?

Muncun syndrome frequently is associated with a mild sensorineural hearing loss in the low to mid frequency. But this presentation can often be misleading since the children can appear behaviorally untestable since they may also have behavioral or intellectual disabilities. They have normal otoacoustic emissions except at 2000 Hz. But behaviorally, if you are able to get behavioral results, you can get a mild low to mid frequency hearing loss but it can often seem as unreliable testing and not like a true hearing loss. But sedated ABRs often reveal that no there is actually a mild low to mid frequency hearing loss especially at 500, 1000, 2000 and sometimes 4000 showing that since OAEs don't test the low frequencies, they're not reliable to determine the hair cell or hearing status at this type of loss.

So I have two cases I have patient A. So patient A was initially tested at 5 for her left ear. She had absent OAEs at 2 and 3000 Hz but present 4 through 8 in her right ear. She was absent in 2000 Hz in present 3 to 8. So behavioral testing showed mild sensorineural hearing loss in the low to mid frequencies 5000 through 1000 Hz bilaterally.

If you are able to read it it notes poor reliability and they tried vra CPA as well as conventional testing methods but did not believe this results were reliable.

So they came back at 6. So in August they were 6 almost a carbon copy hearing test from the last one when they were 5. This was noted as fair reliability. They did CPA 2 tester but OAEs could not be tested because there was an open PE tube.

So they came back about two months later in October mild to essentially normal hearing loss. Sensory neural once again fair to poor test reliability. They did standard this time. Once again OAES could not be tested due to PE tubes being present.

So they came back in January once again to get another behavioral test. Once again almost a carbon copy from October fair to poor reliability is marked. They once again tried vra CPA with single tester and with two tester the OAEs could not be tested because the patient still had a PE tube in both ears. So they still thought that this test results were inconclusive and not reliable. So they scheduled a sedated abr.

This occurred in March when the patient was sick. Still the ABR showed mild sensorineural hearing loss 5 to 2000 Hz rising to normal hearing 3 to 4000 in the right ear and mild sensorineural hearing loss 5 to 4000 Hz in the left ear. Absolute and inner wave latencies were within normal limits bilaterally.

So the conclusion of this case is that results of the ABR were consistent with the behavioral test results that they were getting. But due to relying on OAES or inability to get oaes due to PE2 from conductive hearing loss problems that can be seen with Moon Coon syndrome. This patient seemed untestable and unreliable so an accurate diagnosis could not be made. They performed many audiologic tests including a sedated ABR which all confirmed low to mid frequency sensory neural hearing loss bilaterally which is the classic case for Moon Coon syndrome. So patient B other relevant histories that they had Congenital CMV Some audiologic history before this test that we're going to talk about is that they passed the newborn hearing screening bilaterally.

In January of 23 they had a normal ABR, February of 24, had present OAEs and could not be tested in 25, so they were scheduled for an audiologic evaluation and recheck. For January of 26 they had normal temps. OEs were present 3 to 8 kilohertz but could not tolerate the probe at 2000 Hertz in the right ear as was said in the notes and present 3-8Khz and absent 2Khz in the left ear. Audiologic behavioral testing was ruled inconclusive due to patient cooperation. They attempted VRA but couldn't get any results that they put down and they scheduled A sedated ABR.

Before this sedated ABR, the patient was recently diagnosed with Muncun syndrome. The OAEs were present 3 to 8 absent at 2 kilohertz in the right ear and same in the left. The results of the ABR were normal hearing at 5000 Hz, mild hearing loss 1 through 4 Khz with a sensorineural component at 2000 Hz and conductive at all other frequencies for the right ear. In left ear normal hearing 5-1000 Hz and 4000 with a mild conductive hearing loss at 2000 Hz. So this one is a little bit of a different case, but you also see the pattern of 2kHz sensorineural hearing loss here.

Conductive hearing loss can also be really common with mooncrean syndrome due to cleft palate in the cranial stenosis causing fluid different presentation but also shows absent 2K OAEs and then sensory neural hearing loss at 2000 Hz during a sedated ABR. This patient was then put on a monitoring list because they have to check the lower frequencies more frequently since the lower frequency hearing loss can develop with the child as they age.

Thank you. Thank you Jaelyn. I think you know what's very interesting is with the advent of more opportunities to look at genetics now, I think we're going to be identifying kids with syndromes that we never really even thought to look about before. And the fact that you got to see two kids with Monkin syndrome, really in the same period of time is probably going to be an addition that audiologists are going to be encountering more frequently. So thank you for presenting a syndrome that is really not very well known, but you had good experience with that in a short time with two patients.

All right, we're going to move on next to Liam Smyth. Dr. Liam Smyth, a recent graduate of the Ohio State University and in the same line as all of our other students, also a former LEND trainee. So one of the things that I think about, when I think about that, is how fortunate audiologists are to be able to work in an interdisciplinary team and learn from each other. And Liam's case actually shows that. So with no further ado, I'll turn it over to you, Liam.

All right, thank you, Dr. Whitelaw. I guess I should have updated my credential, but I am Liam Smyth. Today we're going to talk about dual sensory impairment as it relates to audiology. Well, I'll give you an overview of dual sensory impairment and its effects on daily life. We'll talk about what we, as audiologists can do with patients with dsi.

We'll go through some different interventions, such as hearing aids and assistive devices. We'll talk about that in our case report.

So first we'll define what dual sensory impairment is. It's the impairment of both hearing and vision. This is an impairment estimated to occur in 10 to 20% of the population, depending on who you ask. It has been estimated to affect about one in nine adults over the age of 80. And while we have a good idea of what it is and the prevalence of it, we have less agreement on the degrees of severity of dual sensory impairment because we have both degrees of hearing loss, mild, moderate, severe, etc.

And degrees of vision loss. Bringing the two together is a little bit less clear. But if we think about the way that having dual sensory impairment affects daily life, perhaps not surprisingly, it's associated with an increase in chronic depression and chronic anxiety. About two thirds of patients with a dual sensory impairment diagnosis have been estimated to be susceptible to cognitive decline, and that number increases with age. Patients with dual sensory impairment have greater difficulty with activities of daily living, dexterity, mobility, compared to those who either have one impairment, either just vision loss or just hearing loss or no impairment at all.

And perhaps not surprisingly, dual sensory impairment has been associated with increased in specialist visits, be it audiologists or optometrists or low vision specialists. If we drill a little Bit further into some of these impacts on daily life and look at the psychosocial factors. DSI dual sensory impairment has been associated with poor psychosocial outcomes pretty much across the board. A decrease in overall life satisfaction. If you think of positive affect versus negative affect, with positive affect essentially being a more positive disposition, more optimistic outlook on life, dual sensory impairment tends to tip the scale in the opposite direction.

As I mentioned before, increased depression, depressive symptoms, social isolation, loneliness, autonomy. I mentioned some of those activities of daily living. And we've also seen an increase or associated with decreased self esteem. So, having defined dual sensory impairment in the way it can affect our patients, what do we do? As audiologists, we diagnose hearing loss.

We oversee oral rehabilitation, be it more conventional methods like hearing aids or effective communication strategies. And sometimes we have to think a little bit outside the box. We can fit a variety of other assistive devices which we'll talk about later on in our case study.

Obviously, one of the tools in our toolkit as audiologists is effective communication strategies. And this slide and the next one is adapted from a presentation that I did for a workshop at the Iowa City va. Right at my externship we have a support group, a dual sensory impairment support group group that's a joint venture with our colleagues in Milwaukee. So we in audiology made this presentation. We talked a lot about effective communication strategies at that session.

We emphasized things like wait until you're in the same room to start a conversation, identify yourself, get the listener's attention before speaking, reduce distractions. These are all things that we talk about, make up the bread and butter of our day to day operation as audiologists. With the additional

impairment of the vision modality, sensory modality. I think these communication strategies, the importance of these communication strategies is even more so. We have more of these strategies like reduce distractions like the tv, turn on more lights in the room, things like that.

One thing I wanted to touch on was barriers to hearing healthcare uptake, something I spend a lot of time on, especially as a former LEND trainee. In the literature we know that patients with dual sensory impairment have been found to have a lower uptake of hearing healthcare. They report more dissatisfaction with their care quality and more difficulty finding a healthcare provider. I thought this was very interesting. 60% of patients with dual sensory impairment have been found to forego help due to either the perception that their hearing loss is not severe enough, the presence of competing priorities, be it the vision loss or the dexterity concern or what have you, or concern about managing hearing aids with poor vision.

The Idea that even if their hearing loss is severe enough and it takes enough priority to get help, these patients are concerned. Am I going to be able to effectively implement any intervention with the hearing loss because of my vision loss? And among the patients with dual sensory impairment who do seek hearing health care, an estimated 40% of them are unsure if their audiologist even knew of their dual sensory impairment diagnosis or simply believed that the audiologist didn't know. I mentioned earlier the dissatisfaction with care quality that plays a big role in this.

So we'll move on to hearing aids. One of the most conventional tools in our proverbial toolkit is audiologists. A little more than half of those with hearing loss own hearing aids and have that number about third or port low use. When we think of proper hearing aid maintenance, at a minimum, most hearing aids will have are microphones. All hearing aids will have that.

Wax guards. And then, you know, we can have domes or tubes or batteries. You know, all of these basic items of maintenance are things that we talk about with our patients with hearing loss. For folks

who have dual sensory impairment who also have a vision loss, who also have the concern of being able to see their hearing aid or have dexterity to work with their hearing aid, you know, maintenance introduces additional variables.

What I always tell my patients at the Iowa City VA is consult with our low vision clinic because they can take a more holistic look at not just what we do in audiology, but see if they have other devices or other techniques that can help them with other hearing aids. They can consider the patient's support system. Do they have folks like a spouse or a caregiver or a child who can help them with these things?

What we as audiologists can do is help control some of these variables. For example, rechargeable versus batteries. I'm sure we get this question a lot in general, especially when you consider how difficult the battery case is to open. And now that we have childproof packaging for hearing aid batteries, which is, I think most of us would say, is quite difficult, we have found that rechargeable hearing aids may be easier to use because fewer parts to manipulate eases the simplicity of maintenance. So that's the route that I generally go when I have patients who struggle with vision or dexterity.

And one other thing that I do is I often, especially in the VA population where I was working, use a custom molded piece like a seashell instead of a dome.

So that brings us to our case study. This is where we're going to talk about some more unconventional outside the box Type of things, specifically assistive devices. What you're seeing on your screen right now is a poster presentation of a case study that I presented down at the Joint Defense VA Audiology Conference, JDVAC back in March. So the remainder of this presentation has been adapted from that.

So this patient that we're going to look at, he's a long standing patient of the Iowa City va. We have followed him for a long time for profound hearing loss and poor word understanding. He is more of a

cochlear implant candidate based on his audiogram. He has basically profound hearing loss across the board with very poor word recognition bilaterally. He wears ITE hearing aids. He didn't want to go the cochlear implant route.

I was. So we worked with what we got. But at a hearing test in May of last year, he reported that his most significant concern at the moment was feeling safe at home when his wife is not there. Specifically, if he's sitting in bed or taking a nap on the couch and his hearing aids are not in, can he hear the doorbell? Can he hear the smoke alarm?

Can he hear a carbon monoxide alarm? Because because of the severity of his hearing loss, he doesn't usually hear them on their own. So what we do is we looked at our catalog of things we have on contract at the VA of assistive devices and kind of put together a constellation of assistive devices. We had a receiver by his bed that plugged into a bed shaker. The receiver can plug it usually either into a bed shaker or a strobe light.

We're just trying to deliver in a auditory signal in a non auditory fashion. For perhaps obvious reasons having dual sensory impairment. He went with the bed shaker. And we had a doorbell and a smoke alarm and carbon monoxide transmitter all connected to this receiver. And our initial attempt at ordering this set of devices didn't really work due to what we're going to call supply chain issues.

The receiver kept showing up with broken parts or broken buttons or not working. So after four tries, we had to get a little, you know, change horses a little bit. Fortunately, another vendor came on contract around this time. Bellman. So we kiboshed our old setup and started over with the new vendor.

And we had the receiver in the bedroom, which also had an alarm clock built in a nice added feature. We had that connected to the bed shaker. And then we added the doorbell and smoke alarm and carbon monoxide transmitters. We added a second receiver for his living room if he ever takes a nap on

the couch and has his hearing AIDS out. He wanted to be able to hear his doorbell and smoke alarm there as well.

And we also had a telephone transmitter. Just since Bellman had it on contract. He had a landline telephone. It was just a nice little thing we could add on.

So we ordered all that for him. We shipped all that to him. This would have been in June of 2025. We had follow up phone calls discussing this in July and August. He reported that he successfully set all of these up.

I think he had a tech savvy friend help him as well. But the more important thing is that he found significant benefit from using these devices. His only concern was that the Bellman bed shaker was not as powerful as he wanted to be. So he had a very creative, ingenious solution around that. He took one of the old receivers that I mentioned.

We had a supply chain issue where we kept having to send it back. He took one of the bed shakers out of that. He just MacGyvered it in, spliced it into the Bellman receiver and voila. That solved that problem. The reason I include that last little anecdote is to drive home the main takeaways of this case study and this presentation, which is that when working with patients with hearing loss and or dual sensory impairment, it is important for the audiologist to consider unconventional areas where assistance is needed to improve quality of life and to think outside the box in doing so.

Like with assistive listening devices, we learned a lot from doing this case. We learned a lot about dual sensory impairment and assistive listening devices. We learned a lot about low vision. We at the Iowa City VA work a lot more closely with our colleagues in low vision. So for us this was really a positive learning experience.

And that was all as my presentation. I will Yield Back to Dr. Whitelaw. Thank you, Dr. Smith. That was a great presentation to think about how do we do, how do we work in interdisciplinary teams and the benefit of that. And I know audiologists are always looking for populations that we should be reaching out to.

And very clearly that dual sensory population is in need and in desire of our services. And I loved your MacGyver reference, so thank you. Our last case presenter for today is going to be Madison Pollock. Madison is currently a 4th year doctor of Audiology student at the Ohio State University and she's completing her fourth year in New York City. And she's also a former LEND trainee and has a very interesting case to present to us today.

Take it away, Madison. Hello. Today I will be presenting when a migraine gets loud, an audiologic Puzzle and a complex neurologic case. So, looking into who our patient is, she is a 43 year old woman and she's scheduled to come in for a tinnitus evaluation. And no information was known prior to the appointment.

No intake, paperwork or questionnaires were completed. And we also did not have access to any of her medical records. So the only thing that we knew was that she was coming in with the report of tinnitus. And something that is important to know throughout the rest of the presentation is that her husband does attend every appointment with her.

So, leading up to the appointment, the patient reported an extensive history of hemi migraines with a specific episode that happened in August of 2025. And the severe migraine resulted in several hours of paralysis and unconsciousness, which ended up leading to hospitalization, and a few weeks later underwent an eeg. During the eeg, the patient reported severe head pain and pressure. And at that point the EEG was discontinued due to the severity of the pressure and the pain. And that was all in August of 2025.

So after the EEG, the patient reported that she started hearing this quiet tinnitus that progressively got. Got louder and also became constant. She described it as wiry and sharp and said that it was more so on the left side, but sometimes involves the right ear. The patient also described a central head sensation and a sense that her ears were sometimes talking to each other. The onset of her tinnitus, she experienced imbalance and a sensation of falling whenever she moved her eyes or her head.

But she does deny visual spinning and true vertigo, and that imbalance and sensation of falling has since improved. She also noticed a reduced hearing in the left ear and noted that hearing specific sounds and high frequency sounds specifically were very hard for her and background noise became an issue. She also reported an extreme sound intolerance which was constant. And these symptoms did result in suicidal ideation.

Other appointments that she saw prior to our appointment with her in March, she saw several ents and several audiologists. And during each appointment, she did report severe pain in the left ear when tympanometry was performed. And she also reported completing a course of oral prednisone for a sudden hearing loss. At that point, she just kind of kept being referred on to other people as well as being referred back to her neurologist, because people, you know, not many people were sure kind of how to go about these symptoms as well as how the neurologic side plays into it. So other treatments that were attempted were masking devices, craniosacral therapy, chiropractic treatment and cognitive and behavioral approaches including sessions with a tinnitus focused therapist.

She also is currently still wearing earplugs or loops. She reports wearing them several hours a day but does notice a higher sensitivity to sound when she wears them for a long time and therefore is very cognizant to not hit that threshold. So she's very cognizant of putting them in, taking them out, putting them back in when needed, but trying not to extend the time period of that wear. So other medical history that was reported again the long standing hemiplegic migraines, POTS and glaucoma which are

treated with daily eye drops since the eeg. She has now started taking Klonopin, Lexapro and a benzodiazepine which are helpful for sleep, reducing the hyperacusis as well as reducing suicidality.

Other past otologic history includes childhood ear infections and a prior left tympanic membrane rupture which has since healed. Family history is notable for gradual left sided hearing loss and tinnitus in her mother and other members of her maternal maternal family. So during the appointment in March we did do a hearing test on her. The hearing test is shown showing that there is hearing within normal limits from 250 to 4000Hz sloping to a mild sensorineural hearing loss at 6000 and 8000Hz. There is a 15dB difference with the left ear being poor than the right from 1000 to 4000 Hz.

PTAs and SRTS are both in agreement and so all of that part looks good. Something notable is that word recognition there was 100% in the right ear and 88% in the left earth. So other testing was performed at this appointment. Otoscopy was unremarkable. Tympanometry was not completed due to the report of severe pain on that left side.

Extended high frequencies were completed in the right ear up to 12.5 12.5k hertz and were discontinued at that point due to pain and report of pain from the patient. The left ear for extended high frequencies were not tested again due to that pain. A quicksin or a quick speech and noise test was completed. Two lists were completed. The first list the SNR loss was 9.5 and the second list list the SNR loss was 3.5.

We were not able to complete more or a third test due to patient fatigue so we took those and averaged them to a 6.5 which is an indicative of a mild SNR loss, a THI or a tinnitus handicap inventory was also completed with a score of 87 which indicated indicates a catastrophic tinnitus disturbance. And at that point all other testing was discontinued due to ear and head pain. Other testing would have included sound tolerance levels and tinnitus matching and further speech and noise testing. During the reports of the pain, the patient was holding their head and holding their head in their lap. However reported that it

wasn't more so ear pain, however, it was just radiating throughout her whole head.

So our initial recommendations, due to just the significant medical history that we're seeing and that could be there and a lot that is in play here, we chose to hold off on all definite recommendations and we asked the patient to sign a release of records. We wanted to obtain prior ENT neurology and PCP records just to kind of piece things together and see, take a little further look into things. And the patient agreed to that. At that point the patient was also scheduled for a one week follow up to review the past medical records and to attempt to obtain further audiologic testing that's focused on the sound sensitivity and the tinnitus. Some short term recommendations that were given for that week, just to kind of get us started, was beginning a cognitive behavioral therapy program, limiting the prolonged use of earplugs, using CBT or mindfulness strategies for stress reduction, and proceeding cautiously with sound based interventions like the masking devices to avoid provoking the pain.

So as we pulled together the records, we did receive quite a few records, almost about 100 pages worth. So the history was notable for development of Duffy antibodies during the patient's gestation. So that is when the mother's immune system creates an antibodies that cross the placenta and attack the baby's red blood cells and that can result in anemia or jaundice. She was also reportedly born as a blue baby or born cyanotic and required an exchange transfusion at birth. But no long term complications from the neonatal events have been reported.

The patient also reports an onset of migraines at about 13, initially associated with menstrual cycles, but over time have progressed to the hemiplegic migraines. So she's had quite a bit of neuroimaging done starting back to where we can see up to 20, 2016 showing a diffused set cerebral atrophy. A repeat MRI shows brain parenchymal volume loss and another one again demonstrating that parenchymal volume loss with an additional finding of a left lateral ventricle xanthogranulum. So parenchymal volume loss is the loss of active brain tissue, which can also happen as you age or with

other neurological conditions. And the left lateral ventricle, xanthogranulum is a rare benign growth that originates in the chord plexus in the left lateral ventricle.

So there are many documented medical problems that were in her list. And really looking at the symptoms and the medical problem list that she has, it is full body, it is going from her head to her muscles and her neck, to her reproductive system, to pots. Just many, many things going on. And at this point, we start to look at this as something that may be more so full body and systemic that's going on and not just, just in the ears. So this was really important for us to look at.

So at this point, once we've gotten these records and we've seen that she does have pretty extensive volume loss in the brain, as well as all of these other medical conditions that are going on, we then went to research. And so looking into the research, there is a lot of emerging evidence that is coming out that suggests that tinnitus and hyperacusis, as well as speech and noise difficulties, may reflect the central nervous system dysfunction, so involving both auditory and non auditory brain regions. So neuroimaging studies demonstrate that brain tissue loss and altered connectivity can affect networks responsible for auditory processing, attention, sensory gating and emotional regulation, potentially explaining symptoms that appear disproportionate to the degree of, of peripheral hearing loss. So really this is showing us exactly what she's reporting, that this volume loss in her brain could be related to the tinnitus, the hyperacusis, and the speech and noise difficulties. However, it's still unknown of how that's going on and how they're related.

So as we brought her back a week later, we did ask quite a few more case history questions just to kind of piece together this big puzzle. So the long history of migraines, the hemiplegic features that involved from menstrual related headaches, began around 30, several months after the birth of her third child. So about 13 years ago. Her migraine triggers include hormonal changes, heat and sunlight, and exertion. Migraine episodes can involve prolonged visual auras, including central colorful sensations

and transient peripheral vision loss, as well as transient focal weakness and paralysis.

So really, when she's having these migraines, her vision is becoming distorted. She's also not able to see things that are not right in front of her. The migraine episodes are also reported to be, yes, visual as well as the hearing part of things. She reports multiple neurological evaluations including EEG and serial brain MRI dating back to adolescence that were described to her as showing brain volume loss or brain atrophy, but it's reported to be stable over time. So her past medical history as reported includes POTS reproductive issues that are also going on as well as gastrointestinal issues.

She also had an ophthalmology evaluation after a severe visual disturbance that did not identify a definitive ocular cause, however was then diagnosed with glaucoma. She describes the tinnitus as her most distressing symptom and her most distressing medical issue at the moment, which is contributing to the significant emotional distress, stress as well as interfering with her sleep. She acknowledges ongoing concern that her constellation of symptoms have not been addressed and she's really looking for things to kind of all be pieced together and integrated across each provider. So further testing that was completed at this appointment we did do an R spin or a revised speech and noise test test. It was completed at a plus 8 signal to noise ratio with a high predictability score of 100 and a low predictability score of 66% and uncomfortable loudness levels were also completed.

They were reported to be within the range of 20 to 30 decibels, however that may be influenced by anxiety or the specific stimulus that was used. As the patient did not demonstrate sound sensitivity during conversational speech at a normal volume. The tinnitus was also pitch matched to 6,000 hertz, so right where that drop begins to the mild hearing loss range and was loudness matched to 45db or 10db slide.

So our recommendations at this point with the tinnitus, the sound intolerance and the speech and noise difficulties, there may be a significant neurologic or systemic contribution rather than just a

straightforward otologic etiology. So recommendations are provided below. So we referred to a neuroimmunology specialist for a comprehensive evaluation of the brain atrophy, the migraine and neurological history, the impacts on the audiologic system, visual symptoms and other systemic factors such as the pots, reproductive issues as well as the glaucoma. To identify potential medical medically modifiable factors. We also look to implement immediate tinnitus and sound sensitivity management strategies so again reducing the stress and anxiety and enrolling in the CBT as well as use of background noise and enriching sounds, especially during sleep.

We also noted to avoid excessive painful sounds, which is hard in her situation. Then we generated the report, sent the referral and at this point where we are at now, she has been referred on to neuroimmunology and looking for her to come back once the neuroimmunology evaluation is complete and that she is medically clear.

So again, patient has been referred to the neuroimmunologist and will follow up with us after medical clearance for continued management of tinnitus, sound intolerance in speech and noise difficulties. So the main takeaways that I really learned from this case was the importance of an in depth medical review when necessary. You know, we had a lot of kind of red flags, I guess, that noted that something else could be going on and being able to take a further look into her medical records were really important in this, in this case. We also wanted to avoid premature recommendations because we don't know what's going on. And if this isn't a solely otologic otologic symptoms at play, we want to be able to take a look at all parts.

Relying on research and real time research and going into the deep dive when seeing that patient was really important here. Getting a full understanding of what does the brain volume loss mean and how do we, how do we use that research to help then treat our patients and learn more interprofessional practice and referring outside and then viewing the patient as a whole person and not just their ears. If

we had just looked at her ears with the tinnitus, the sound sensitivity and the speech and noise difficulties, we would have never learned all that we did from her medical history and may have masked her symptoms that she was, was experiencing, however, may not have fixed the whole issue. So that is all. Thank you.

Thank you, Madison. That's a very broad case in terms of bringing in the whole person. And I think as audiologists we're going to start to see, and we've already started to see more emphasis on migraine as we learn more about both vestibular migraines, but now certainly more about cochlear migraines. And I'm not attributing that that's what's going on with her, but I think that'll be something that's more common to all of us. So thank you for giving a description of how one can take a look at that through case history and also through professionals like a neuroimmunologist that we might not have worked with before.

All right, we're going to bring everybody up on the screen and we have some time for questions and answers. If you have any questions that you would like to pose, you can certainly type them in and we will take a look at what's up There. I have some questions that I would like to share if no one's submitting questions at the moment.

Yes, thank you for. Ellen said that she was so impressed with these young audiologists. Me too. I said when we were backstage that I love my job because I get to interact with these people every single day. And it's an amazing way to get to do audiology for sure.

Liam, I have a question for you. You talked about how the VA has a low vision clinic and it's really easy to partner with them. Do you have any thoughts about what an audiologist, say maybe in a private practice or in a different type of setting could do to partner with low vision providers to provide deaf blind services or dual sensory services? Well, you touched on a really great point then in a VA hospital or any large hospital, you tend to have more internal practitioners. You can refer to some communities

have more flow vision providers than others.

So I guess what I would say is ask around, see who's in your network and establish that relationship early and proactively. I would say maybe try to have that relationship up and running before you have patients with low vision come into your clinic. So on day one you can make the appropriate referral.

Excellent.

Emma, I have a question for you. When you were talking about this patient, would you ever use telehealth with a patient like that for an efficiency or would that always be something in person that you. That you were talking about the follow up? Yeah. So I think I know you're asking specifically for a follow up, but for the hearing aid consult, I think it could potentially be in person or telehealth if that's preferable to the patient hearing aid fitting wise.

Obviously I'd prefer in person. Well, it needs to be in person to get the hearing aid, obviously. But kind of just like establishing that rapport I think is better to do in person and then a follow up just because of the way we set things up. I think that's more so if the person can tolerate the gain at the first appointment and we were able to complete the real ear. I think it just depends on what works for the patient.

Like I said, kind of meeting them, where they're at. So clearly we weren't able to do the real ears. So I think then that leads us to want to do an in person, the follow up visit. Thank you. I have a question for you, Dana.

You know, in your case you talked about the fact that the child was implanted, but the implant wasn't really used until they started school. Do you have any Recommendations of things that could have been done differently to maybe set that child up for success a little bit earlier. I do, yes. I think a main

concern that I have when I was looking at the patient's case history and kind of talking to the teachers is just that the parent was unable to kind of comprehend how important the cochlear implant is for language development. I think that the child was very against it.

And I believe that when the child would go to school and kind of have the cochlear implant on, he had children around him that are also using a cochlear implant and are also using a hearing aid. So it's not something that was like very abnormal to him when he was in that setting, but when he's at home, I do see that the parent might have not viewed the importance of it. And that could easily just have been the language barrier between the parent and then also the surgeon and the surgical team and even the audiologist as well. So I think there was multiple factors that was going on that kind of caused for the cochlear implant to not be worn. But I think education is like a crucial aspect when working with these families and kind of encouraging the child into wearing it and also with the surgical and audiological team kind of having baby steps, saying wear it for three hours a day, two hours a day, and then building until the child is more used to that access to.

To sound. So I think it's a multi effort when it comes to these type of stuff. So fantastic. Jaylen, I would like to ask you about syndromic kinds of issues. What do you think about genetics and where we are right now in terms of.

I know you had mentioned, I don't know if it was backstage or during your presentation that your syndrome was just really identified less than a decade ago. So what's your prediction about the new world of genetics?

I think genetics leads us into a whole new world of being able to. To give parents some more straightforward answers might not always be straightforward recommendations. But with Moon Coon syndrome specifically, we know that the sensorineural hearing loss is likely and that the conductive hearing loss also is likely. So we can monitor children with that. So I think using genetics, people can

get scared when it comes to genetics or that it's not going to tell you anything.

But I think in an audiologic sense, it can actually tell you a lot. And my hope is that in the next five, 10 years, we make genetic panels more accessible to families with hearing loss, especially with no known family history of hearing loss, because Afterwards, they can more understand what's causing the hearing loss. And sometimes having a more definite answer allows families to be more willing to move forward with recommendations where if it's just like, oh, this child has hearing loss, we don't know why, then the parents feel responsible and it's not necessarily their fault. Could be a genetic mutation that just occurred with this child. So I think genetics will help us in the future a lot more with being able to counsel families, being able to.

To make recommendations for each specific child in less of a, like, generic sense. And now we know that in our own offices, we're able to swab the child's cheek and get some information and some answers. And it's been proven to be ethical and also very effective. So it looks like audiologists may even have more of a partnership in that in the future. I agree.

And I have a question for Madison in terms of, I guess, along that same line of scope of practice, there's so much in the case that you presented that really needs to bring people together as an interdisciplinary team. What if someone said to you, how is it your scope of practice to refer to, say, a neuroimmunologist? How might you answer that? Yeah. When looking at the patient and everything that they have brought to us, it's important for us to take a whole part in our patients.

We are focusing solely on the ear. However, our patients aren't just ears. They are whole people. And if we can get them to the person that they need to go to, why wouldn't we, you know, if nobody else has taken a look at her full history? Because you have so many specialists that are focusing on each different part.

I think it's important that if one person can put those pieces together and get that patient where they need to go, that's just going to be best for the patient. Really what we want is success for our patient, and we want to help. And so at that point, if we are able to do that and take a look at, you know, what's going on or what the symptoms are and be able to say, hey, maybe this isn't for me, or this isn't something that I can help with at this moment. Let me get to you, to the person who should thank you with that last question. I think that we're ready to wrap up up for today.

I appreciate everyone who joined in, and if you have friends who weren't able to make it or you want to take a look at these cases again, you'll be able to do that in the future in audiology Online. And I'd like to thank all of our presenters for today who I think did an excellent job with some very interesting cases. Thank you, Dr. Whitelaw, and thanks to all of our presenters. The cases that you selected were fascinating. They were so well presented, so much to learn.

I loved your insights. I just made like a whole sheet of notes here of everything I learned. I've been in the field 20 something years. So thank you all. I think too what people don't see behind the scenes that goes into these webinars, lots and lots and lots of preparation.

So with your busy externships and everything you have going on, we really appreciate you bringing these cases to Audiology Online. Best of luck to all of you and your Audiology careers. We hope to work with you again. And thanks to everybody who logged in. Hope you have a wonderful afternoon.

That's a wrap today. Bye bye.