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Grand Rounds in partnership with the University of South Dakota

Presenters: Jennifer Phelan, AuD, Karen Toole, AuD, Cara Donovan, AuD, Rachel Appleton, AuD AuD, Katie Druyvestein, BS, Andrea Galindo, BS, Meghan Kalhoefer, BS, Kaitlyn Burkamper, AuD

Hello everyone and thank you for joining today's webinar grand rounds Audiology clinical experience in Guatemala presented in partnership with the University of South Dakota. Our presenters today include faculty from the University of South Dakota and students from several audiology programs, as well as audiologists from Oticon Sounds of Life Hearing center and Pacific Hearing Center Services. I'm sorry. All of our presenters participated in a recent humanitarian trip to provide audiology services to people living in remote areas of Guatemala and they're going to share some of their cases with us today.

Because there are so many presenters today, I'm going to refer you to our website to read their individual bios and Dr. Phelan will also be introducing each one as we go through today's presentation. So welcome. And Dr. Phelan, I will turn the floor over to you. Excellent. Thank you so much, Christy.

I'm so happy everybody could join us and I'm really excited to be with this group of people again. We were all together in May. We spent really a fabulous week in Guatemala. We do have a lot of presenters. It is myself.

And then we have three other audiologists, Rachel, Kara and Karen. And then we have four graduate clinicians which this is so exciting to me that we have graduate clinicians from four different AUD programs that are represented that were able to join us on the trip. And that's just, it's really a treat to do that. It gives them great exposure to things that are different and I love just having different perspectives. So really excited that we had, we had so many students and that we continue to, they they wanted to present and talk with you about their trip.

Here are our disclosures. You can look at those. These are the limitations and risks.

And then here are our learning outcomes. We want to talk about how we were able to provide a humanitarian trip that meets the needs of the patients and still provides evidence based practice. That's really important, especially on a trip again where we have graduate clinicians talk about how to

evaluate and address unique patient needs in a remote audiology clinic and then talk about culturally competent adaptive communication strategies. We want to look at patient interactions in a multilingual or resource limited environment. We have to be creative when we're in Guatemala to be sure that we're able to provide service and then so that we're able to continue to sustain that service.

And so I think that's one of the most important things. We'll talk about how this program also continues and it wasn't just we went there in May and they won't have an audiologist. Again, just so you know, there are a lot of pictures throughout. Photos of the staff and patients were taken during our trip to Nuevo Progreso and all of these are used with permission of the individual. So that was really important that we wanted everybody to know that all of our pictures, these individuals, the patients are so gracious, they want their pictures taken, taken.

They ask us to take pictures with them on their phones and it really is a fabulous experience and they're always happy to be a part of the, a part of the pictures. So you, you will get to, to see some of those. We were fortunate enough to have a photographer with us and so that's how we got a lot of these fabulous pictures. So I'm going to start and my presentation is, I'm going to, we're going to talk about support for services and use of ABR in humanitarian outreach. There's another presentation that's going to talk a little bit about abr.

But really this is really important for me and I'm very passionate about being able to bring this service because we know that it's not always possible to behaviorally test and if we can bring ABR and be able to do both unsedated and sedated ABRs, we're able to in one trip help a family and not necessarily have to say, oh no, you need to come back. So we're going to talk more about, more about this. I'm really big on all of our pictures, so that's pretty much what all of our presentation is. Before I jump into the abr, I do want to talk about where we go because that's really important. We go to Hospital de la Familia and they have a foundation, hdlf.

It's in Nuevo Progreso, Guatemala. When we fly in, we fly into Guatemala City and then we take a day's bus ride and it's a really good day's bus ride to get to Nuevo Progreso. It's west and slightly north of Guatemala City, but we leave right after breakfast and we usually get into Nuevo Progreso not too much earlier than dinner time. So it's quite a long trip. We're not in an urban area at all.

So it's being able to provide these services and get to individuals who would have to travel and they still do travel, they travel very, very far. But it's nice to be able to be in a place that's a bit more accessible to them. HGLF is a 70 bed hospital. It provides inpatient and outpatient health when there aren't teams out there, they do have three full time Guatemalan physicians and they provide primary care and they're really instrumental in screening patients for the specialty teams. So when the specialty teams come out, it's really critical that we are efficient.

And so the physicians there are able to make it so that they do the screening so that the specialty teams, we already know the patients that are coming and then they also manage anything post operatively and we've also worked with them. So we go with an ENT group and there are surgeries, but then we've also done some training to be able to do some hearing aid checks. The patients do pay for services at HDLF on a sliding scale, but they're never turned away for their inability to pay. One of the things that we, that is really important to us is kind of how this space, you can see in this picture, this is actually what the outpatient building looks like. It was funded by donations from a grant from the Office of American Schools and Hospitals Abroad, which is asha, which people were a little confused about.

But it's not the ASHA we think of. It's the Office for American Schools and Hospitals Abroad and usaid. And so being money, a grant came in along with donations from three people. On their history page you can read all about sort of how HCLF got started, but that is how all of this happened. And to know that they were able to give these grants and this is still going strong.

Actually they have their.

I want to say it's 50th anniversary is, is in 2026. So one thing I wanted to show was this P, because I think getting a sense of where we were clinically is important. This picture here, it's from the second floor looking down, maybe even the third floor looking down. So the second and third floors are residences, essentially like dorms where all of us stay. And then that bottom floor with that courtyard right there is their outpatient clinic.

And so that courtyard where there's just maybe one or two people standing in that courtyard is full of people all day long. If they have a 2 o' clock appointment, they're typically still there right in the morning. And so people sit and they actually end up putting some tarps up to keep the sun out and then the afternoon rain that we typically get to protect them from the elements. But it's very different from our clinics. You can see, I mean, this is essentially the waiting room.

And so just kind of get you in the mindset of what, of what this sort of looks like and what this is. It is incredibly hot and humid and everyone is incredibly gracious, waiting and letting us do everything that we need to do. But this is that space. And honestly, I think this is what makes HDLF so special, is it was built for these service trips. And like I mentioned, we go with ent, so there's physicians and nurses, anesthesiologists that go and they're able to house all of us.

They also feed us and make sure that we're getting everything we need so that we can provide. So that we can provide care during the week.

One of the biggest things I said about this is the student initiative, and that's why I go on this trip. This. All three of these pictures are graduate clinicians here. And then these are the two graduate clinicians who came with Lindsey Jorgensen and I from University of South Dakota. And really, students are the heart of this trip.

When you think about clinicians, the patients are the reason we go and to be able to give this outreach. But the reason this trip is really impactful is also because being able to bring students, and this being specifically a student initiative trip. So every audiologist that goes on this trip knows it's a student initiative trip and recognizes that they will be in the capacity of a clinical educator or a preceptor during that trip. It's great for the students because the students are able to work with other people outside of their region, you know, before they go out on their. On their externship.

So, you know, they're in a. On a university clinic or, you know, they're out in community, but their community is close because they still have to be able to get back for classes. And so this gives them the opportunity to work with clinicians from all across the country and, you know, experience things that are definitely different. It's. The playing field is leveled a little bit.

The audiologists, we definitely have, you know, knowledge to provide the students, but the actual physical going and the process of how it is, even if we've been. Even if you've been before, things change and we have to adapt and we have to be flexible. And so the students are really a part of all that. How are we going to set. What is this going to look like?

And they really are members of the team. And so that's a huge part of why this trip is really, really, really so important because we get to. We get to bring students along as well when we go. We do have a pediatric protocol. And this is actually something where it's, you know, we can say we have to be flexible.

We learned throughout this trip we've been doing abrs in nuevo progreso now for this is the third year we've done them. And we have always, since they've gone, they've always had pediatric patients. And this last trip was finally when we were like, okay, here's what we're going to do different for pediatrics. And so as we were building the flow this time we said, okay, instead of just having one patient list, we're going to have an adult patient list and a pediatric patient list. We want to be sure that the clinicians who

are working with kids are most comfortable and we can see how old they are because someone might be comfortable with, you know, five and up, but not a two year old, and that's okay.

And so we have, we worked on this pediatric protocol where we're providing the same level of care that we would provide in a clinic here in the States. We're doing otoscopy, oaes tympanometry, and then we're working on getting behavioral testing. And we want to be sure that we aren't in a position as much as possible to say, hey, we need you to come back. It happens and it happens often. You'll see in this presentation that follow up is really important, which is why it's important that we continue this.

But also from a pediatric protocol standpoint, we want to be able to get as much information as we can during that one visit. These families travel hours, they walk, they take buses. And so we want to be sure that we can get as much as we can from them. And so also that means you can see in this picture where we're doing real ear measures in the same day. If we test and they do have a hearing loss, we will, we fit hearing aids same day.

And that's for adults and for kids. And so that pediatric protocol is really something that we realized we need, especially with the ABRs in the mix. And so we're going to keep developing that for future trips.

So we do abrs, we do both unsedated, which the picture in the middle is Kara doing an unsedated ABR in the recovery room. And we also do sedated ABRs, which you can see me on that side, which with anesthesiology right there. And so if we aren't able to get behavioral testing, if we are, if they're not rely can't reliably condition, then we will recommend an ABR to be able to get that information with the unit that we have. You can see in the picture, it is a vivasonic unit. And so we are able to do some in an unsedated environment, as long as it's quiet.

And then we also do them in the, in the OR if, if needed. And so having this space. So HDLF does have, it's the 70 bed hospital. I showed you the picture of the outpatient clinic across the street is they

do have an OR different from an OR in the US it's one big room and there's three beds. So that's a little bit different.

Something that is always a little bit surprising when you go into the OR for the first time. And so we're able to get this information for individuals who aren't able to respond. We want to get some threshold estimated information. And we can do the abrs. HDLF is amazing because even if we're doing sedated, so we have to have them MPO for anesthesia, we are able to tell the physicians and I will say, I need this kiddo tested.

They've already eaten lunch. If they eat lunch, then that's a problem because we're likely not going to get into the OR that day. And they will make arrangements for them to stay in Nuevo Progreso so that they can, so that they can get their test done in the morning. And so it really is a great kind of relationship that we've developed and they're, they're absolutely willing, willing to do that for us. So along with that pediatric protocol, we actually started saying, let's try to get all the kids early, as early as possible.

Let's see if we can get them before they eat lunch. Because if we can do it before they eat lunch, then we can usually get a couple of them in, in the afternoon.

So sedated ABRs in the OR, they look really like sedated ABRs in the U.S. we have anesthesia. Anesthesia is, they use a propofol and keep the patient comfortable while we're doing, while we're doing all of the testing, you can see there's lots of us kind of involved and involved and hands on. Being able to have access to the OR was huge. I will say the ENT team that we, that we go with, there was conversations that we wanted to do sedated ABRs three years ago and anesthesia was, was there and was willing to do it. And they've just gotten better and better helping us and recognizing we need to get them done.

I broke my record for ABRS this trip and I did 14 in three days. I think it was 14 and three and a half days. So a lot of ABRS happening.

And so this is a picture of the vivisonic, because I want to talk about. These look like these are like textbook. These are beautiful. Textbook waves. And the reason I show this to you is because this, the case that I'm going to talk about really doesn't have.

Doesn't have to do with hearing loss, but it does have to do with access to services. And so, you know, I'm not going to tell you anything kind of crazy in terms of the process of the ABR or anything like that. I mean, what you see on the screen are absolutely beautiful waveforms, if I made them larger. I mean, these are textbook textbooks, waveforms, great waveforms for teaching students. And so this is.

This is what we were able to get. This is what they. What we got on Emily, who is the little girl in the middle. And really, the whole point of me sort of talking about our pediatric protocol and what we're doing and how we go about doing it is right here is. Is Emily.

Her mom is amazing. She is 4 years old and they actually live in Guatemala City. And so you might think. Well, I talked about how long we traveled to be able to get to hdlf. They did the same thing.

Why audiology services are scarce in Guatemala in general. And so this little girly, Emily, was diagnosed with autism. And mom was working to get her the services that she needed. And mom said to us afterwards, can I get a copy of the test? And that typically doesn't happen.

Families don't typically ask us for that. And so through interpreters, we started having more of a conversation. And we learned that Emily's grandmother lived near hdlf. And so we were. They.

She heard that we were coming. The daughter and granddaughter came because Emily needed a hearing test so that she could get additional services. Mom said that she wasn't able to or eligible for additional services until she had a hearing test. And so she said she had one scheduled in Guatemala City that got canceled, and mom decided just to take the trip out so that we were able to do the testing. If Emily had shown up to the outpatient clinic and we didn't have access to ABR, we would not have been able to give the family what they needed and the documentation they needed to be able to go back to Guatemala City and get Emily the services she needs.

And so ABR is really, really becoming a critical part of this trip. And it shows how important it is for us to be able to provide a really full scope of Services so that we're able to support all of the needs of the patients that we're seeing. For Emily, it wasn't hearing related again, you saw the waves, they're beautiful. But it was all about us being able to get that documentation for the family so that now mom has what she needs to move forward to get Emily the services that she, that she needs.

I, I have any questions here. If anybody wants to put anything in the Q and A, I will end and move on to Katie just showing you this. You'll see there's, that's actually one of Emily's waveforms. So that's one of her wave five. Um, Guatemala, um, has um, a fair number of volcanoes.

And so we ended up having um, an image drawn from Emily's wave five of a volcano. And then actually there were a number of us, six total, three audiologists and three students who ended up having, having this tattooed when we got back to Guatemala City. So Emily is a really, really special case, near and dear to all of our hearts. So I'm happy I got to talk about her today. Next I have Katie and Katie is going to talk about Ms.

Bubbles, who is also an adorable little girl. Yes. And you will find out why she was named Miss Bubbles for this presentation. It won't be very difficult to find out, but yeah, my name is Katie and this is Ms. Bubbles.

So a little background. Again, this is her. Exactly. And it was hard to find the best kind of pictures because she was exactly like this in every single photo. Just smiling, giggling, so expressive and enjoying.

Enjoying Bubbles. It's fantastic to see. So she was a six year old little girl and her parents brought her in with reports that she had no speech or language and they were a little concerned, they just wanted to get some more information. And so through some more case history we found out that she primarily communicates via contact gestures, you know, tugging on mom's shirt or just kind of waving. Getting visual communication with her parents, which is concerning I think immediately as a student and then with my clinical educators, we were already starting to see that this is at least a severe hearing loss, if not maybe profound hearing loss present with Ms.

Bubbles. So kind of just going down the line. We started with otoscopy and found she was fully occluded with cerumen in both years. And we were able to remove that manually and with the earigator, which is always fun for 6 year olds to go through. And once we were able to clear her ear canals, we could get into tympanometry.

And we could see that she was referred on OAEs, which I'll get into more with testing. And also important to note is that Ms. Bubbles came with her two younger brothers. One was three years old and one was an 18 month old baby. And that family of five traveled, traveled about four hours by bus to come to this appointment specifically for Ms.

Bubbles. So it was definitely a family involved trip and we wanted to make it the most for the entire family.

So getting into testing, like I said, she did refer on otoacoustic emissions and her tims did show a sub S. And so we were at least comforted knowing that her outer ear, middle ear space, that those weren't of concern necessarily. But still in the back of our mind coming up with that differential diagnosis of this could be a very severe hearing loss, considering speech and language is not present. And we could even just see that in the appointment. Obviously she wasn't talking and maybe the bubbles helped. She could laugh and we could hear those kind of verbal indications, but that was about it.

We got her into the booth and it was a little tiny sauna booth. But condition play audiometry regardless. And because of what I've kind of talked about already, her reliability did end up being poor, just because the task at hand was a little bit beyond what we could do. You know, it was beyond a Spanish interpreter and working with Spanish speakers. But she had no language in general.

So even cue cards showing what the task was, you're listening for something and raising your hand when you hear it, those were just. That was just something that she wasn't able to do and understandable. At this point, we were pretty confident about what we would find. And especially we saw she would not startle at high intensity levels, which is always a concern with our pediatric patients. And this was through conditioning.

We weren't able to condition. Again, it's too difficult of a task. And then we already know some ideas of what we might find. And then vibro tactile was also not able to condition with. So taking the bone oscillator off and placing it on her hand and still making it a fun environment.

You know, this little buzzing thing, it's weird, right? Putting it on her knee and seeing if she would respond that way to the task and wasn't really worth exhausting her out. Instead, we referred for a sedated ABR at the next morning because we had those resources, we had the equipment, we had, you know, these incredible audiologists that are great at identifying wave 5 formats or waveforms. So we referred for that the next morning. But the question still is what about her little brothers, those that

was still in the picture.

So hearing loss within families, this is, you know, obvious within the audiology community. But if we have this inclination of a profound loss, this makes the likelihood of her siblings having a hearing loss, even at a lesser degree, even more increased. And so with parents they still reported there was no history of family hearing loss. But that just could be because they've never noticed it or investigated it. But regardless, we still investigated with the little brothers, starting with the three year old.

He did refer on otoacoustic emissions as well and had type, type B flat temps bilaterally. So we kind of came to the conclusion with that, that yes, these are our two little boys and the anatomy at this point makes them much more susceptible to a middle ear pathology. But we didn't stop there. With our 18 month old, we could not test for various reasons. I believe there was not keeping a seal.

He was a little fussy. I think he had just eaten. And then the room environment too was a little loud for OAEs at that point. But we were able to get temps and they were type C bilaterally. So this kind of begs the question, would this trigger a referral in our home clinics?

And I think 100%, 110%, this would be a yes across the board. If we had a family and there was only concern with the little girl or you know, any child for that matter, we would want to look at the entire family dynamic. Dynamic and especially those younger siblings. That one don't have speech and language quite yet, but will it be ever developing? And so this definitely triggered it with us.

And so that kind of is that similarity between back home clinic to bringing it to a humanitarian trip is that we are still following those same evidence based practices, even if it looks a little different. Different.

So one child turned into family testing. Quite beautiful. We were able to get all three scheduled for sedated ABRs the next morning. And again that connection and foundation with Hospital de la Familia

was fantastic because they were able to house the family overnight. Like I said, they had traveled four hours by bus.

They certainly weren't going to travel back and then somehow make it back to get an ABR for their child. So it was great that we would have the family sit tight so we can have all three tested in the morning. And we did find when compared to normative data that both of the little brothers, because we started from youngest to oldest, had normal hearing. And with their middle ear pathology they were referred to ENT, which again was also present on this trip, which, which is very full circle, we were able to still touch base with them. And with Ms.

Bubbles we did see there was no response to stimulus at the limit of the equipment, which was the vibronic. And that was a difficult conversation because it was suspected maybe by the parents a little bit. It was suspected by us as the clinicians and students just seeing her in front of us and then getting this information that she has no speech or language. So it was, is that definite diagnosis at the end of it, but it still is a little difficult. So at that point we were able to give the family some resources about Guatemalan sign language, nearby services for help or really just a way for them to communicate.

And if that looks a little different, that's okay. They've already developed a system amongst each other and what works, works. And so sort of my closing or final thoughts really is this is the same evidence based practice like I said, that we do at our home clinics, but it's different at the same time. All at the same time it looks a little different. It's not usual to say let's just do an ABR the next day.

But we were able to do that for the family and it felt comforting as a student to maybe not see the outcome the parents would have wanted, but to know that they were given answers and that's what they came for. And, and they were able to leave with that answer for Ms. Bubbles. Yeah. Thank you, Katie.

That was great. It really was a great case. They were a great family and adorable. And you're right, that family already had their own way of communicating right with her. And basically one of the things we told the family was to be consistent that mom and dad were doing the same things, to communicate the same ways.

So excellent, excellent. Thank you. Next we have Andrea, who's going to talk about bilateral hearing loss in an eight year old that we saw. Yes. Hello everyone, my name is Andrea.

As it was already mentioned, I'm going to be talking about this little boy. He's an eight year old boy. That really touched my heart. I would say in all of the patients that we saw, because it was a lot, I think that's the one that drew the most attention to me personally. And we're going to talk about, about why.

So a little bit of case history. Mom stated that the teacher had noticed that Axel was not able to pay attention in class and that he had very small vocabulary for his age to be 8 years old and he only had about 10 words would communicate mostly through gestures and pointing. So mom didn't really know what was going on. She really thought that he was just shy because to her, he understands everything that she says. And whenever she would say, okay, let's come to eat, he would come and sit at the table and eat.

And so just talking with her and seeing. Having a little bit of background to see if he was going to be able to be a part of our behavioral testing or what were the other steps that we had to do. We found out that, yeah, like, it's very hard for him to say words and pronounce correctly. He was in speech therapy, but ended up up. They ended up kicking him out because there wasn't enough space for him to stay.

Let's see, what else did I write? Mom knew that he was able to hear. He wasn't able to hear that well. And she said as. As soon as she heard that, heard that we were coming, she was like, I'm taking my kid there because I really want to know what's going on, and I need to take care of this.

All right. So mom told me that they both rode a motorcycle for an hour to be able to be seen by us, which also impacted me a lot because I was like, who. Who has the money? They don't have enough money to be able to have enough food in their table. And then they're over here spending money to transport themselves to a place that they know that they're going to find answers.

And that was just also really amazing to me. And it shocked me because I was like, it's. This just shows how important it is for you to find solutions for your kid. And it just touched me. So mom stated that compared to the other kid that she also has, which was a younger baby, she knew that he could not hear as well because her other baby was already saying so many words.

So comparing her two kids, she definitely knew that something was going on.

All right, so for the results, we did otoscopy, and it was clear in both ears. We did temps and it was as bilaterally. Everything was looking okay. We did the testing, and I wasn't able to follow up with the testing, but I did get the results, and they showed moderate sloping to moderate severe sensory neural hearing loss bilateral laterally, and both ears were at able. So we decided to fit him with Oticon Ruby 2 PP with ear molds.

We did real ear. And I think what also came to as a shock to me was his reaction. I really expected him to be, like, overjoyed and really happy and jumping and obviously that's not what happens in the real world. So now I have a little bit of things that I want to talk about that I experienced while I was with him. So what happened after the fitting?

After I saw him sitting there with his hearing aids, he looked uncomfortable, he looked a little bit scared. And I was like, how do I make him just have a better experience at this and not feel scared of being here? And one of the things that I think really helped was that I was able to speak Spanish. So, so I

would play with him a lot and just say little jokes and just approach to him in a lower level. Like I would get on my knees and be like, just to seem less scary and just paying attention a lot to his facial expressions because I didn't want him to leave and just be like, why did I.

Why was I here for X amount of hours? Which was probably the whole entire day without eating? And you know, know kids that don't know how to express themselves also have feelings, also have thoughts. So I'm like, how can I make this experience as fun as possible? So I went to go get stickers and I went to go get other things that would make him want to personalize his hearing aids and more excited to wear them and to know that those are his and he, he needs to take care of them.

And how do I explain that with him not understanding a lot of the words that I'm telling him? So you have to involve mom, you have to involve dad. And even though they might not understand everything you say, you also try to make it in easier words that it's just not too complicated because they're going to be like, I don't know what you're telling me, so I'm not going to do it. And just reassuring them that everything is okay and that it doesn't mean that their kid is not going to develop to how the other kids will and that it's going to be different because there's a different formula for every kid. And so, yeah.

So what were the parents reactions? I think they were also a little bit scared, but excited because they knew that something was going to happen from that moment on. And it was a lot of counseling and saying that, that it is important for him to wear it at all times, at all waking hours when his eyes are open, that he should be wearing them. And it's also crazy because they would be scared to just hold the hearing aid or they're like, I don't want to touch it, I don't want to break it I don't know what I'm doing. Like, he can take care of that and counseling and saying, like, maybe he doesn't understand what I'm going to tell him.

Like, yeah, I can show him how to do things, but you might understand me better than he does. So that's why I'm telling you, so you can keep him accountable and just also make him wear it, you know,

because you're the parent not saying it like that, but you know what I mean? And so both parents were counseled on expectations and how things were not going to change from one day to the next, since his brain was not used to all that sound because of the lack of schooling from parents, tried to make it as easy as possible to understand. And finally, what was the kid's reaction when I would take the hearing aid off to show him again, okay, show me how you do it. Show me how you clean it.

Show me how you put the battery and all these things. He was like, this is mine. Like, don't touch it. I'm gonna wear it. And the whole emotion in his face shifted.

And it was just great to see that even though there's a limited amount of words that he understands that he was able to feel safe in that environment and feel happy and just continue to, you know, engage with me. And so, yeah. How did we proceed? I think my patient was scared at first, but once he was fitted, he looked. He looked like he was going to wear them and he was going to personalize them.

And building that trust with him, I think, was what was the most important part of the entire process. Because if I had not been approachable or been less scary, I think he would have acted a different way. So I think that's my take on my case study, and that's all I have to say. Yeah, Andrea, that's a huge takeaway. I mean, I think we have to remember we get to build rapport in clinic over time.

And when we're there, we're building rapport. We need to build rapport really, really quickly. And so building that trust of that family, especially if they're slightly apprehensive, is really huge. And you did a really great job with this family. Thank you.

Thank you. So we had two graduate clinicians who presented. And now we're going to go to one of the audiologists who was with us on the trip, Acara.

Hi, everyone. Like Jen said, my name is Cara Donovan. I am a pediatric audiologist in Cleveland, and I've been going to Guatemala now for three years. And we've seen the clinic grow quite a bit in these three years. As you can see, we have encountered a lot of pediatric patients, a lot of families, and that has been such an exciting part of the clinic journey.

We've seen a lot of these developments like likely because of all of the other multidisciplinary teams that we've had join us, including ENT. We even got some referrals from the eye clinic. We've had some other physicians join us from Mexico. We've had other SLPs, physical therapists, OTs. So that has been a great referral source for us.

So that we are seeing and capturing as many patients that have hearing loss within the population. The other we are seeing more of is just the patient referrals. So as we're doing really great work in the community, we are seeing more and more of the patients saying, telling their brothers, they're telling their sisters, they're telling their grandparents, hey, you got to bring in the family. So we're seeing more full families, which has been great. And we're starting to take a bit of a different approach on how we treat this because as we know we're, we're wanting to capture, you know, if we capture one kid with hearing loss, we're going to want to test the, the whole family.

So that's a little bit about what this case is. So let's meet my patient here. So this was MT. He, it was actually brought in by his mom and his mom did bring in his two other siblings. So MT is the middle child.

He's five years old, he's healthy. Otherwise no ear infections, no ear surgeries. Mother did mention to me that MT doesn't have any language. So he's 5 years old and he's non verbal as we've seen in a couple other cases today, they are concerned for autism and trying to figure out what is going on. A lot of these physicians are referring actually to our clinic because they're trying to rule out hearing as any contributing factor to why they are nonverbal or have no language.

So mom did travel with the three siblings. She actually took the bus five hours to see us. She showed up bright and early in the morning, 7:30. They waited all day. We actually saw them right before lunch.

And whenever we see a couple kids come up on our schedule, we try to get them in as quickly as possible. So we actually tag teamed this. So I took MT and one of the other audiologists, I believe Jen, actually tested the older sibling. So they're. The older sibling was also non Verbal, unfortunately.

And mom, again, was also concerned with. With autism. The youngest sibling was a little girl. She was very cute. She was typically developing and had normal hearing.

The nice thing with our practice and the way that we operate at the clinic is we are so incredibly collaborative amongst all of our team. So, you know, Jen and I both knew that these kids were nonverbal. Possible autism diagnosis. So we're always keeping that in the back of our head. And Jen sort of came up to me and said, hey, hey, I wanted to let you know that.

And I was halfway through my case at this point, wanted to let you know that MT's oldest brother actually just got diagnosed with a mild high frequency hearing loss. So as this case is developing, I'm keeping this in the back of my head, right, because now this is a positive case history or a positive case history for family hearing loss. So starting out with our findings, of course he had occluded cerumen, which is the case often. We see a lot of kids with impacted cerumen. We have to be very mindful, though, when we're taking out wax with these kiddos.

Not only because we know there's a possible autism diagnosis. So we're concerned for him, you know, just the sensory overload. And I want him to obviously be able to complete the additional tasks that we need to get done in order to tell how he's hearing. But we also want to keep in mind that there are a lot of middle ear pathologies in Guatemala. So actually with mt, what we did is we re always or.

And what I typically do is I always start with instrumentation, trying to get the wax out, you know, using a tool and not jumping right to the irrigator. We do have irrigation down there, which is a. Is a fantastic tool. And, and having irrigator, especially with our adults, is been very helpful for us. However, not knowing exactly what that middle ear status looks like.

We use instrumentation for him, so we were able to get the wax out with instrumentation. And then he actually needed a break because that was a lot for him. And we let. We were able to be flexible. He went and had lunch, lunch.

And he came back and he completed the rest of our testing. So we got tympanometry within normal limits bilaterally. We could have done the irrigator, but good thing, you know, we waited and now we know for sure that his. His temps were normal. So we then went to distortion product otoacoustic admissions.

So previously when we have worked with kids at our clinic, we see such high volumes that we have done TEM and DPOAEs. If they pass those, we would just pass them and say, okay, everything looks great and consider that more of a screening. Moving into these last few years, we've actually started to get away from that and concentrated on getting accurate results for these families. So for the distortion product otoacoustic emissions, we actually got got responses across both the right and the left ears that were considered a pass. I just want to highlight here, for our clinic purposes, we do use four present responses as a pass.

However, I want to highlight a couple things for you. So the responses are considered robust. Robust and present right around like 2-3000Hz. However, when you look at these screens as we go down into those high, higher frequencies, they are not as robust. And what we know about distortion product otoacoustic ignitions is that they can rule out anything greater than a mild hearing loss.

And there are some, some recent literature that suggests that if the responses are not as robust and present that that could be indicative of slight and mild hearing loss. Now keep in mind, right halfway through, Jen comes up to me and she says, hey, hey brother. Just got diagnosed with a mild high frequency hearing loss. So I was so glad that we had started to switch our protocols and start ensuring that we're testing all kids using pure tone audiometry and not just stopping at that screening phase because in this case we could potentially miss a mild high frequency hearing loss that could have been genetic. So we end up testing mt and he is at this point been in our clinic for well over six, six hours.

So he's been here a while, but he is a great sport and we actually do condition play audiometry. He had a lot of fun and we got hearing within normal limits in both ears and we got 250 through 8, which is phenomenal for him considering again, he is non verbal and, and a lot of it was just a lot of gesture work, you know, because he doesn't, he's not able to always communicate exactly what, what he, what's going on. So just some key takeaways. I think it's always important to consider the family's goals, the family's needs and their history when you're completing a screening versus using a full, full case or full test battery. In this case, the screening absolutely was not appropriate.

One, because we have non verbal, we, he doesn't have language and he's five and two, you know, we learned that he has a brother with hearing loss. Also we want to consider the family's needs and his special needs as the, with the autism diagnosis. So as we mentioned earlier, we are starting to get some referrals from other disciplines who are trying to rule hearing loss out as any contributing factor before they would evaluate for autism. Autism. And so using just the temps and the DPOAEs would not have been sufficient enough.

You know, DPOAEs are a critical tool to our clinic, but they are limited and we need that full test battery to ensure that we're providing a diagnosis of hearing within normal limits. And I love that we're able to use these best practices and remote areas. You know, the Guatemalan community, they deserve our

best and we, and we bring it and that's been so incredibly fun. But also the mom and the family deserves our best. She was so relieved to hear that this, that this son had hearing within normal limits, especially after she just learned that her eldest had hearing loss.

So providing her definitive answers was so relaxing and calming for her. She felt really relief. Thank you so much, Kara. I think that's a, it's a great case to show. I mean, we do have our schedule, but also if a patient comes and they have a sibling, so if we have a pediatric patient who has a sibling, we pretty much just sign them up and we, and we test them again.

They, they're there, we're there. And so this is a really great example of really making sure the family got what they needed during, during their whole trip. Thank you. And next we have a graduate clinician and Caitlyn is going to talk about her case. All right, hello everyone, My name is Caitlin Burkamper.

Just to provide a little bit of context before I start presenting, I am in my last year at Northwestern University and I am in my last three weeks of externship at Ann and Robert H. Laurie, Children's Hospital of Chicago, Chicago, which was awesome coming into this trip, having that pediatric experience and having that focus. In my externship, my main priorities and interest areas really rely in diagnostics, abrs and hearing impaired kids. And so those abrs. When I heard that we were bringing ABR equipment onto this trip, I was very excited to be able to stretch my skills and to use them in a different context. So without further ado, my patient that I'll be going over using the pseudonym Nick.

So this is a 7 year old male that I was able to see with Kara. So on the first day of the trip, when we got to Guatemala, when we got to Nuevo Progreso, we set up clinic and within a couple hours I met Nick. And so he came in with mom seven year old male. And mom was telling us about his long history of chronic middle ear involvement. Mom told us that he constantly is complaining about constantly having things coming out of his ears, but he had never had a hearing test, had not seen ent, and wasn't even really established with a pediatrician.

So when I'm talking to these families, there are lots of questions that I ask my families in the US that I was able to kind of tailor and ask families in Guatemala as well. So talking about, do we have any hearing concerns? Do we have any concerns for speech and language development? Development? And mom had no concerns, but she did make a comment that I thought was interesting, that she was excited to hear the results of the test.

And so it kind of led me to believe that there may be some concerns, but maybe that she just hadn't thought before if she had any real concerns. And she had no concerns for his speech and language development. But again, an interesting thing to note is from the time that I met Nick, really until the time that we finished with his very long appointment, he really didn't talk to us. He didn't say a single word, he didn't vocalize at all. And even when we asked him questions through an interpreter, he didn't nod, he didn't shake his head.

He would nod and shake his head with mom, but he really didn't give us a lot of responses. A couple other questions that I asked was when was our most recent ear infection? Mom guessed probably about a week ago that he had told her that he had some pain in his ears, but nothing coming out of his ears. And then no family history of hearing loss in childhood, which I think is an important question to ask just to get the context before we get started with testing. So then we got started.

There we go. Then we got started with testing. So the first things that we did was tympanometry and oes. His temps were beautiful, which is what we love to see, especially knowing that he has that history of middle ear pathology. So they were type A beautiful.

And then his OES were essentially present in both ears. There were were, I believe, one pitch in each ear that wasn't present. But with a long history of that middle ear involvement, it wasn't something that we were concerned about or even surprised by. And so this testing is all in chronological order also just

for context. So we did temps, we did OEs, and then we tried to test him.

And so he's seven years old. Initially we tried with conventional audiometry and we got, got nothing. And not just nothing. In the way of he wasn't raising his hand, meaning we were up at the output limit limits of the audiometer and we weren't getting a flinch, we weren't getting any eye movement. We were kind of just getting no reaction.

He was a very stoic little kid. And so we brought our tool bag out and we started trying everything. So we tried to play, we tried to, tried play with different toys to see if something would maybe get his attention. We tried having him play with mom, we tried re-instructing, we tried having him race to play. And so Kara and I really put our heads together and, and just tried to get, get what we could.

And really we weren't able to get anything and no response to sound. And so the next thing that we did, it's something that is a of part, part of the protocol at my externship that I think is a really helpful diagnostic tool is he. We did ipsilateral reflexes. And so he had present and robust ipsilateral reflexes at a screening level of 90. And I think this really goes back to that old saying that when you hear hoofbeats, think horses, not zebras.

But something that I think audiology teaches you is it's never a bad idea to rule out the zebras. And, and so when I'm thinking about this, what we're getting so far is normal temps present OEs. My concern started to be for a potential auditory neuropathy. But we ruled that out with those present and robust reflexes, which was fantastic. So where do we go from here?

ABR testing. So a little bit of context behind natural sleep or non sedate ABRs versus sedated ABRs. So natural sleep ABRs in the US typically we're doing them on children that are younger than six, six months old, so birth to six months. And that's simply because babies that young can sleep for them. And then sedated ABRs are really for those kids who we either have a hearing loss that we're

monitoring and a child isn't able to behaviorally test, or for a child that we have concerned that there could be hearing loss and they are not able to participate in our game.

So Nick really fell into that. He was not able to participate in our games, he wasn't able to give us reliable responses. And like Kara said In her presentation, OEs are great because they rule out essentially all but a mild hearing loss. But we also know from research that mild hearing loss can have a great impact on a child's development, both speech and language. And Educational.

So we decided to move forward with an abr, and we discussed with mom on potentially pursuing a sedated ABR the following day. Now, the social considerations in Guatemala are very different than the social considerations that we think of in the US but they're also very similar and there are lots of parallels. So social considerations I think of in the US are things like medical anxiety. If a family is hesitant to sedate their child, things like transportation to the hospital. Is there a facility close to a family where they can provide this testing, even something like how healthy the child is?

Are they healthy enough to be sedated? Do they have other specialists that are going to sedate them that we could potentially do a concurrent PE2 placement and ADR. And so those social considerations were kind of similar in Guatemala. But a couple other things we were thinking of is families are traveling a long ways to come to our hospital. As previous presenters have highlighted, Nick's family traveled about two hours, which compared to some families, traveling eight, nine hours isn't as long, but it's still a barrier to potentially staying in the hospital.

Hospital. And so when we talked to mom about proceeding with a sedated ABR the following day, mom shared with us that she had a baby at home that was being watched by a family member, but that that family member would not likely be able to watch the baby for long term, potentially overnight into the next day. And so Karen and I talked and Jen and I talked, and we decided, even though he's not six months old or able to naturally sleep, let's try a natural sleep abr. Let's give it a try to night. And so

family won't have to worry about coming back and they get answers today.

And so in this, we're really looking at the patient's comfort and considerations there because he was a kid who wasn't talking to us. But mom has no speech and language concerns. And so we were able to do the testing, keep him comfortable, keep mom comfortable, which was awesome. So we brought him actually into the OR suite and had him just sit in a chair and play with cars. It was very cute.

And we had him just sit. And we did a natural sleep ABR without sedation, which was awesome. And he has normal hearing. And so I think that he is a great example of you can be getting normal hearing and still have some other things going on that make you concerned for hearing loss. And it's always important to use your entire toolbox and to use all of your resources to ensure that we're meeting families where they are.

And ruling out the things that we can rule out, which is what the ABR did for us. All right, so like I said, why his case is important, really exhausting that toolbox, something that, like I said, that my externship does, that I think has been a game changer for how I think about clinical practice is doing a screening reflex. I think a lot of times we think like, oh, reflexes. We, we might get them, we might not. But there have been lots of kids that we've been able to rule rule out an.

On a kid who is not behaviorally testable, even prior to an abr. And so that is something that I think was really important with Nick, is exhausting that entire toolbox. Again, talking about that natural sleep versus sedated abr. Even though he wasn't a baby able to naturally sleep, we could still do a non sedated ABR on him because he was able to sit and participate and then again, rule out what you can while you can and be able to zoom out and say, okay, what are the goals for this family? What are the things that we can do for them?

And I think that we were able to really do that with Nick and his mom. All right, and those are my final thoughts. Thank you so much. Thanks, Caitlin. That was great.

I think he was our first ABR of the trip. He was our first abr. Yeah. It was nice to have a successful one under our belt when we had so many more the rest. The rest of the week.

Absolutely you. Thank you so much. And next we have graduate clinician Megan who is going to talk about softband implementation with a patient who had a surgical ear. Hi everyone, My name is Megan Californ and I am a uprising third year at Louisiana State University Health Science center in New Orleans. So I'm going to talk about softband implementation on a surgical ear.

So like most of the previous patients, she traveled several hours by bus just to be seen by us. She was 71 and she. She traveled alone to come and have her hearing tested. She perceived a change in hearing in her left ear and then she reported a surgery on her right ear. However, she did not know what kind of surgery was completed and we didn't have access to any medical charts, so we are unsure on which surgery was done.

She denied otalga tinnitus and noise exposure.

So this is the testing results. The left ear was unremarkable during otoscopy type A temp and it was normal sloping to mild sensorineural hearing loss loss. And then in the Right ear. It was a surgical ear type B with normal ear canal volume. And then it was a flat, moderate, moderate, moderate to severe co conductive hearing loss.

And then due to that language barrier, we didn't conduct speech audiometry.

So we fit the patient with a. We fit the patient with the soft band Oticon poly ponto. The device bypasses the damage and then stimulates both cochlea via bone conduction. However, the better cochlea is hearing the information. We were unable to program the Oticon ponto to the exact hearing loss, but all of the softband devices that we brought on this trip were programmed to a maximum conductive loss.

So this was one of six bahas that we fit on this trip.

So we instructed the patient how to use the volume control and let her decide which volume setting was most comfortable. We instructed the patient on how the importance of proper placement of the device, of how that the sound. The sound processor should sit behind the ear but should not touch the ear. And then we counseled on how to properly put on the softband, change the back batteries, change the volume level and how to avoid moisture. And she immediately started sobbing, crying.

It was so thankful as she hasn't heard out of her right ear very well in 20 years. It was very impactful just being able to give her that ability to hear better.

Awesome. Thank you, Megan. That was a great case because we did. You said we fit six total. And even with some of the limitations of being tricky programming them, we don't just say, oh, well, then we can't bring them again.

Being creative, thinking outside the box on how we can help our patients. And with that thinking outside the box box. Oh, there we go. Thinking outside the box. It's Rachel.

So Rachel is an audiologist and is going to talk more about how we are creative in our testing and working down at the clinic in Nuevo Progreso. Great. Thank you, Dr. Phelan, and thank you all for joining us. So, like Jen said, I'm an audiologist based in California. California.

And I've been lucky to be a part of this kind of humanitarian work since 2017. And I just feel really passionate about our work down there. Our goal to build that sustainable clinic and being able to share the experience with students on our student initiative. But today I think we've already heard a lot about how you have to think outside the box when you come to humanitarian work and doing clinic in a remote location. But I wanted to dive a little bit deeper into that and I wanted to use an adult case to use that.

We've talked a lot about PEDs today, but we do also see adult patients in Guatemala. This patient has a very typical history for an adult Guatemalan patient. Like you've heard already today, we do travel down with ents, which is a real special thing that we are able to take advantage of when we're down there. So we do post op testing, we do pre op testing. So this was one that they had referred over to us to try to get more information.

And the testing for these cases are really, really essential because, because the ents might not always have access to imaging like they do in the US they do not do imaging at the hospital. So it would be something that the patient would have to get outside before coming to us. So every once in a while the patient will have imaging, but it's not as common as it would here. So the tested results that we get are just absolutely essential for the ents and their diagnosis. So this patient, they denied tinnitus inverted ago.

They did have a history of ear infections, which once again, I think you heard a lot about that already today from the previous cases. So many untreated ear infections in Guatemalan. This patient did have normal otoscopy and normal type A tympanograms. The patient was pretty reliable during air conduction testing. But then once we got to bone, things just kind of started to go downhill.

We weren't really able to get what we felt comfortable for reliable bone conduction results. And it kind of left us with this question is what's going on with this patient? Is it conductive? Is it sensorineural? And

obviously that's a pretty essential question before sending back to ent.

That's one of the main things they need to know before looking into surgery as a potential option for this patient. So the normal temps, the normal otoscopy with this big airborne gap just really didn't make sense. So we knew we needed to investigate a little bit more for this patient. So what do you think we did next? You know, we, we have a lot of patients, as you heard before, that live pretty far away.

So returning for testing another day is not really an option. Plus, we're there just such a limited time on this particular trip we could have done abr, but as you heard as well, they were pretty busy with a lot of pediatric abrs and we don't always have ABR equipment available on our trips. So that could have been an option. But what we ended up doing instead was the Weber test. So I'm not sure how many of you remember Learning about tuning fork tests in school, but there are a few different ones in the Weber test is one of them.

And the purpose of the Weber test is really to determine if there is a unilateral conductive component. Tuning fork tests were used prior to the invention of the electric bone oscillator. And when I was learning about them in graduate school, I thought it was really silly and I wasn't really sure why we even had to learn about them. Why would you do a bone, a tuning fork test when we can just do bone conduction testing and have more modern methods to figure out what's going on? So I always kind of just like threw that away, like, oh, I'm never going to use this.

But Guatemala, and working in Guatemala has really taught me just how, how important and helpful that test can be. So to, you can use the tuning fork to do the Weber test, but you can also just do it with your bone oscillator, which is what we do in Guatemala. So this picture has a photo of this wonderful little girl who we were testing and she is wearing what we call the Kudu wave. And that is the audiometer, one of the types of audiometers that we use down there. So it's insert earphones with the noise canceling headphones over top.

And then the bone conduction is actually forehead placement, which is perfect for the Weber test. But you can also just hold a regular bone oscillator to the forehead if you don't have a tuning fork.

So to complete the Weber test, you present a low frequency super threshold tone via bone conduction to the forehead and you ask the patient which ear did they hear the tone louder? So to interpret it, a positive Weber is considered when the tone is louder in the ear with the worst air conduction thresholds. And that indicates a unilateral conductive component. And a negative Weber is when the tone is louder in the ear with the better air conduction threshold or it's heard equally in both ears and that indicates no conductive component. So one important thing to remember about the Weber test is that it only applies to the frequency that you test.

So for example, if you use a 500 Hz tone, then you're only going to know if there is a conductive component at 500 Hz doesn't apply to like the whole frequency range.

So for going back to our patient example, for this patient, a positive Weber would be if they heard the tone louder in the left ear. And another negative Weber would be if they heard the tone louder in the right ear or if they were equal in both ears, what happened for this patient? The patient actually heard the tone louder in the right ear, which would have been considered a negative weber. And so we're like, okay, it's probably sensorineural, at least at the frequency that we were testing. That makes sense with our normal tympanograms or normal lactoscopy.

But we're like, what is going on? We still needed to get more information. The audiogram didn't match that, so we did not feel comfortable sending this patient back to ENT with this audiogram.

So what we did next was we actually reinstructed the patient with we use the pocket talker and a translator. And we also repeated the testing using two audiologists and conditioning. So we actually

very similar to how you would condition a pediatric patient, we conditioned the adult patient. Most of our patients in Guatemala have never had a hearing test before. And they might not even know anyone who's had a hearing test before.

So they might not have any idea how they're supposed to do this. And just like our patients at home in the clinic, they might have a lot of hearing loss. So they might be trying to fill in those gaps when you're giving them instructions and maybe a little bit of guessing. The other thing that we did was we actually moved. Moved the patient to a different space to test because our clinic is very busy, as Dr. Phelan was mentioning.

There's tons of people there in the courtyard waiting, and there's just lots happening. So sometimes if we can move that patient to a space that's a little bit less busy, then they can just focus a little bit more on the test and what they're doing. After we retested them, the audiogram was sensorineural, and we felt much more confident in our results and was able to send the patient back to EM ent, But they ended up coming back to us after seeing the ENT for hearing aids, and we were very much more pleased with our outcome there.

So kind of, how can you use this at home in your typical everyday clinic? As we've talked about, you can use it to confirm when your audio metric findings don't match up or don't make sense with the rest of your test gallery or your cases history. You can do a quick bedside test, difficult to test patients. You can use it to help you find out a little bit more information on them. And then, just as a reminder, it's only a screening test.

It does not replace, you know, traditional bone conduction. You want to use it in conjunction with other evaluations as part of your test battery. And just some final thoughts for me. You know, one of the most important things we teach our students when we're down there, both when we're down there and when we're here, is just to keep going if things don't make sense. You know, don't accept your test results if

they don't match up.

Especially when, you know these patients, they don't have as much access to come back. Sometimes you might have to think outside the box to do that. Okay, what other tests can I do? I think another big thing that I've learned is just learning from others. You know, I really thought at first that tuning fork tests were something I was never going to use in my clinical career.

And it's something that I use pretty regularly now. And it's something that I've learned from the other audiologists on the trips. So I think traveling with a group of audiologists from all over the country can really level up your practice. I've learned so many things that I use every day, and I've taken home to our own clinic and has made our clinic better. So I really feel like every time we go down, we just get to level up each other and make each other better.

And then I also just want to say, you know, humanitarian work really fuels your soul. And I encourage everybody who's interested to try and add more humanitarian work and volunteer work to your life. It's so impactful. And even though we get to give the gift of hearing to the Guatemalan people, I just feel like we get so much back in return. You'll get more hugs and blessings, blessings and love than you can ever imagine if you go on a trip.

Absolutely. Rachel, we meet just so many wonderful people. And we do, we learn as much from them as we give. And so really, in a lot of ways, it's amazing. So thank you for that.

Also, clinically, it's great to hear how some of our lower tech options can be used and maybe making us think about the web again. So. Yes. Yeah. Like I said, never thought I was going to use it.

I was like, why do I need to know this? Excellent. Thanks. And then we have one last presentation.

We're going to have Karen, and Karen is going to talk about some differential diagnosis and

multidisciplinary care for another one of our of our pediatric patients.

Yeah. So thank you so much. My name is Karen Toole. I work for hodocon. And I was really honored to be able to go on this trip with all of the presenters that you've already met before.

The experience, as Rachel said, it is life changing. So if you ever have the opportunity to be able to support a humanitarian trip or actually travel with somebody on a trip like this, I highly recommend it. What you've seen from a lot of the presenters today is patients coming in for the first time. And what I like to really focus on with my presentation, presentation is a patient that came in for a follow up. So they were actually seen before our trip in May.

So this is JT. He's an 11 year old male resident of Guatemala. He traveled about two hours on that same bus to be able to see the HDLF team. And his primary complaints today were tinnitus, ear infections and trouble sleeping as well as as some pressure. So we looked at his chart from 2024 as well to see if there were any differences and changes to his complaints back then and prior to 2025.

When we saw him, it was more like more trouble sleeping than it was today, a lot more tinnitus and a larger history of ear infections. And his return visit, it was more to see what was going on as of today and make sure that there was that good follow up.

His primary reason for the visit in 2025 is that his mom reported that his hearing aids were broken. However she didn't bring them with so there was no way for us to be able to clean check them, make sure that they were functioning properly, properly. And then he has been reporting to his mom that there was some increased pressure and pain, especially while he was sleeping. And mom's primary goal of course was to get new hearing aids for him because she felt like it was helping him in his day to day. So then we started to make sure that we could test him.

The equipment that we saw in other presenters was exactly the same. So we used used a good old fashioned otoscopy. His ears were nice and clear. We had the oaz screener that was present. We did tympanometry and reflexes and then we did pure tone air.

And we had two different options with us. One of them was the Cuda wave that you mentioned that was mentioned earlier. However, we also had an Inventus harp that we had a room called the sauna. And the reason it was called the sauna is because it was a closet that we turned into a booth. Basically there was carpet on the walls.

But in Guatemala, especially during the rainy season it is hot and humid. So as soon as you close that door you are literally in a sauna. It is nice and warm and not so nice and warm. So we made sure that we had all of the equipment available. And when I tested him, we went tympanometry.

And what I'd like to show you is there's a difference between where his temps were in 2024 versus where they were in 2025. So in 2024 we were really looking at more A sub s so it was a little bit more reduced in the ability for the temp the ear to move as well as it was in 2025. So as we know, those who have an A sub S is just maybe there's a little bit of fluid back there that's not allowing it to move as well. However, his otoscopy was pretty clear and when he was an ent they didn't show or mention any signs of any fluid back behind his ears.

We also performed otoacoustic emissions, which you can see the screener here in this picture. And he passed in both in ears in both 2024 and 2025. The OAE screener is the Centerio portable tympanometer and OAE. So we got both at the same time and from there we just decided we're going to move on and look at a new hearing test, see what was going on today before we even considered new hearing aids. So I'd like to show you the results of what his pure tone audiometry looked like in 2024, which really resulted in that moderate hearing loss across most frequencies as it started to rise in the higher frequencies.

This is something that absolutely we would want to be able to fit hearing aids to. However, the results from 2025 looked a little bit different. So what we're seeing today in the multiple tests that we did was that his hearing was mostly within the normal limits. Even his bone scores were completely different. So when I saw this, these results of the test, I started to question what was going on because I had it in his follow up notes that he was currently wearing hearing aids and had been for the last year.

So I brought in one of the students who's talked on the panel today and asked them to kind of help me do another test. So we moved from the Cuda A wave and then we went over into the sauna and did a test on the inventus to see if we were getting some good test retest reliability.

Once we finished that, we tested him. Honestly, I feel like it was three times total just to make absolutely sure that the results that we got were, were completely accurate that day because we were, were really concerned that there may be something going on. Maybe he didn't understand the result or the process. He didn't understand when to raise his hand, but he did. And he gave us accurate results all three times that we tested him.

So that told us that his results today were incredibly accurate and he was quite reliable. So then I decided that we needed to probably have a discussion with Mom. We talked about what may be going on when he was wearing the hearing aids, why he was wearing the hearing aids. And his mom said that he really felt a lot of pressure. And when he wore the hearing aids, he noticed that the pressure was less and it could make him sleep better because he could hear the sounds around him.

And then he started saying more, like he was getting a lot of jaw pain and. And a lot of ear pain. So I asked him to describe the jaw pain, and he said that his jaw would slip in the temporomandibular area and that it would pop loud enough that he could hear it and that his ears would hurt constantly. And he felt the need to really relieve the pressure. And what he was doing to relieve the pressure was sticking

his fingers in his ears and trying to blow his cheeks out as hard as possible possible.

So we talked about why that might not be the best option and solution to help relieve the pressure, and we talked about different diagnoses as well. So now we're looking at TMJ disorder and possibly a eustachian tube dysfunction rather than a hearing loss.

We also looked at a couple of different options for him, not only making sure that he had access to the audiology team consistently, but also otolaryngology, which is where he just came from. But then I was thinking about dentistry. How often do you have access to a dentist when you have TMJ issues in the United States? You just go and you mention that you have issues with jaw pain, tmj, lockjaw. But unfortunately, in this clinic, there's not always a dentist available.

And in fact, I wasn't even sure that a dentist would be available to them at all. So I went over to one of the interpreters who was at the hospital a lot more often, and he said, yes, they have a dentist that comes every six months. So now we're looking at that multidisciplinary approach. I referred him over to the dentist. The coordinator got it scheduled so he could talk to him about possible treatments with tmj.

And then while that was being taken care of with mom, we started talking about ways that we can help him relieve the pressure. In a more positive manner, something that's going to actually help him over time. And that's when we started introducing a new treatment plan, including using a Toynbee and a Valsalva maneuver. If you're not familiar with these, a Toynbee and Valsalva maneuvers are going to be where you hold your nose and blow out your cheeks. And then the twin Bee maneuver is going to be the opposite.

It's going to be holding your nose and swallowing at the same time. Both of those are very safe ways to be able to relieve pressure over time. And then we talked about whether or not hearing aids are still an option. Well, based on the audiometric data today that we found to be much more reliable, we decided

not to fit him with a new set of hearing aids since most of his hearing was within normal limits. And then we also chose to do continued follow up over time because of the fact that, you know, the patient is going to need more support, not only for support for learning how to be able to relieve pressure safely, but also continuing to monitor that hearing loss because it's not stable.

Whatever we found in 2024 was not the same as what we found in 2025 and it's really recommended or we're hoping to be able to retest him in six months when they return in November and get a more accurate depiction of what might be going on with his hearing.

So for me, my lessons were learned where everyone does deserve access to quality hearing health care. Middle Earth pathologies can evolve and present very variably. So never really judge that first moment or that first look at hearing as the be all, end all, follow up and making sure that things are consistent is really important. And then of course, finally the value of the whole system mindset. Looking at the entire patient throughout that appointment, looking at his needs, his concern, concerns, talking and uncovering those needs with his mom was really important to really come up with a full new treatment plan to be able to support him in the difficulties that he was having.

And then finally, I think the biggest key takeaways for me as well as I think everybody who had gone on the trip is we do the best we can. And then when you learn to do better better, or when you know better, then you learn to do better. So thanks so much for joining me and here's Jennifer. Done. Excellent.

Thank you so much, Karen. I really appreciate it, everybody. I, I, this was wonderful. I enjoyed it so much. It was great to hear about the cases that were how the variety we saw in that, in that short amount of time that we were, that we were down there.

So it was really a wonderful, wonderful way for us to be able to all get back, get back together. There was two questions in the Q and A. They both were about abrs. You might have gotten more of this

because I think this was in the beginning, but it. Well, I'll be sure to answer them.

Do we do abrs on all age kids? We do. You even heard right Mitchell say, you know, she could have referred her patient for an ABR as well. With the Vivasonic, it's easier to do unsedated ABRs even if they're a bit awake. And so we do do them on all kids.

And then the natural sleep abrs. Caitlin had said we do six months, typically six months and younger. Of course we use discretion and, and make a call when we're in the moment. A new question came in in modern audiology, how do we ethically balance the recommendation of surgical intervention versus advanced hearing aids, especially when both are viable options, but may be influenced by socioeconomic status or family beliefs? I don't know if anybody wants to comment on that one.

So I think one of the. Yeah, go ahead, please. Oh, I was just going to say I was going to jump in and actually just highlight Megan's case in that respect. That woman was a 70 year old woman who had this, this massive conductive loss for over 20 years and she had not actually been to otology yet. She saw us first and we did refer her over to otology, but with that in mind, we did counselor her pretty heavily that she does have an option.

She doesn't, you know, always have to go that surgical route. And that while we want her to get evaluated and have that connection with the otologist, that we certainly can and can help her hear better right here, right now. And that, that is, that was more important to her. Hearing was more important to her than determining even the etiology behind it or learning if there could be a medical fix for it. All she wanted was to hear better.

So I think to your question, which is a great question, is I always, always ask, what is your primary goal today? What is the, what do you want to accomplish today? And what she wanted more than anything was to hear her grandchildren, children. And so we were able to give that back to her just with that bone

conduction device. And she was very pleased.

But I think it's a great, great question and we need to continue even, you know, in the, in, in all clinics, even here, asking our patients what their goals are and, and in considering just More than just a medical intervention. Thanks, Kara. I absolutely agree. I think it's important for us. We also have the information.

If we're keepers of the information, we need to be able with our patients. At the end of the day, they make their medical decisions and so knowing what their goals are makes it easier for us to help them. But they need to know all of those options.

How do we, we'll finish this one up and then we'll go, because it just came in. How do we ensure that our role as consultants does not unconsciously steer a family towards the more profitable option, but one that truly aligns with the patient's best long term care, even if it's financially reward for the practice? I mean, I think we kind of talked about that or maybe I just sort of said, you know, we have to be patient centered, it's about the patients. And again, we can't be gatekeepers of knowledge. And so our job is to inform all of all of those options.

And ethically, I think it is important that we recognize, I mean, it's the same thing of would you fit one hearing aid over another hearing aid? If you know what your cost of goods are. Okay, fine, but what here is there a hearing aid that's going to be more beneficial for the patient? And so we have to think about, we have to think about that. And financially rewarding for the practice.

A practice shouldn't rely on a patient making a decision in a financial way to be solvent, I think would be important. I don't know, Rachel, as a private practice owner, if you have any other quick thoughts on that, that. Yeah, I think, I think I agree with kind of being able to present patients with all of their options. Right. Of all cost ranges.

And also, you know, making sure that you have, when you're working with hearing aids, making sure that you have more than one manufacturer that you can work with and offer them. And really, I think it's really important and really essential that audiologists do consider that question about like, why am I recommending this hearing aid? And always have that in your mind. Because it is so essential that we do remain ethical in our recommendations. So I think, you know, in Guatemala it's a lot easier, I think, because, you know, if a patient can't afford hearing aids and they get them anyways.

So cost is really not as much of an issue down there. But I think, you know, back here it's an absolutely essential question that we have to think about every day. Thank you. I appreciate that and thank you all again. It was wonderful.

To see everybody, and I'm glad we got to talk about these cases today. Yes, I'd like to thank everyone, all of our presenters today for sharing their time and expertise and these unique insights that they have from their from their trip to Guatemala and their work in the clinic there. I'd also like to thank everyone who participated in today's course and remind you that the CEU exam will be available on your Pending Courses page in about 15 minutes or so. We look forward to getting your feedback on the course evaluations, and we hope to see you at future courses on audiology online. This concludes today's webinar and have a great rest of your day.