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Take Your Lunch Break Back! How Anatomy-Based Fitting and ESRT Can Help Improve Clinic Efficiency

Presenters: Cache Pitt, AuD, Barbara Foster, AuD, CCC-A

Hi there, and welcome to our webinar take your lunch break back. How anatomy based fitting and ESRT can help improve clinic efficiency my name is Barb Foster. I am director of education training at Medel, and I'm happy to be joined by Cache Pitt, clinical professor of audiology at Utah State University. We will first review benefits of objective measures, and then Cache will share his clinical experience and insights using their practical application. So let's get started.

After this course, participants will be able to list available objective measures in the maestro fitting software, describe the correlation between ESRT measures and the most comfortable level for Med-El cochlear implant recipients, and list the steps for applying anatomy based fitting in the maestro fitting software.

We encounter objective measures routinely in our daily lives. All professions utilize these measures to reduce subjectivity and gather data. For instance, when you go to the doctor's office, do they simply ask you how your blood pressure is? No, they measure it every time you go in to have an objective number. They can track over time to document stability or to see trends if something changes in school.

Are teachers satisfied with saying that you understood that math problem or that math concept? No. They actually give you an assessment to see how well you absorb the information and then applied it. Of course, it's the same with driving tests. You are assessed in real time of your understanding of the signs and rules of the road.

And then lastly, and likely very familiar to all of you, our audience. When you see a patient for a hearing assessment, do you stop at the question, how's your hearing? No. No, you don't. You document their performance on an audiogram or speech perception measures, tympanometry, etcetera.

As audiologists, especially CI programming audiologists, we utilize objective measures because they are impartial, quantifiable, and typically recorded with diagnostic instruments, whereas subjective measures are based on individual awareness. Oftentimes it's their interpretation of what patients know or remember, especially what sound sounds like, and they may not even have the language to tell you or describe what they're hearing. Or you can look at it this

way. It is the data versus the art of programming or interpreting what the recipient says or responds to, and making guesses at what that might mean.

There are several objective measures available as CI programming audiologists, many of which you may already be familiar. EABRs like Autoart, NRI, or NRT determine the responsiveness of the nerve at the cochlear level. ESRT is a correlate with upper loudness level, so it verifies your mapping levels. EABRS evaluate function of the auditory pathway after surgery. ECOGS monitor hearing preservation, oftentimes used during intraoperative electrode insertion.

Anatomy based fitting, the newest tool available from Med-El to adjust the frequency bands to the exact location of where the electrode contacts are sitting inside each patient's cochlea and SSD test protocol. And that's the measurement of speech understanding and binaural listening skills in persons with single sided deafness and a cochlear implant on the contralateral ear to really assess their binaural listening skills without a specialized test environment.

For the purposes of today's talk, we'll be focusing on two of those objective measures, ESRTs and anatomy based fitting, and how their application can help get to the best fitting maps for your CI patients sooner. That can promote clinical efficiency, and I like to think of it as ESRTs are the gps to getting to the appropriate loudness level for your patient. And anatomy based fitting is a gps for matching pitch. We don't know where we're going unless we have a target, and these two tools help us get there quicker.

For those of you not already familiar with anatomy based fitting, here are a few requirements. The patient does have to have a post operative CT or cone beam CT scan. They need to have the analysis performed in Otoplan. If the clinic has the Otoplan license or by Medel's Otoplan on demand free service. And the data exported from Otoplan is an XML file that then is very easily imported into the maestro fitting software.

So I'm going to turn it over to Cache and he will talk a little bit about he's used both of these tools in his clinic, Utah State, to improve clinic efficiency with his recipients. Thanks, Barb. Thanks for that introduction. I appreciate it. So it might

be helpful to kind of understand my background, where I'm coming from, and my current work situation.

So at Utah State University, I'm a clinical professor. Utah State University is located in Logan, Utah, which is a valley called Cache Valley, which just happens to be the same name as my name. And an interesting fact, I'm not from Cache Valley, but my name is Cache. Just a fun little fact. Our clinic is an independent clinic, meaning that we have many multiple referral sources.

We have several different surgeons who will refer to our clinic. We have about 400 patients across, one and a half full time employees.

Wwell, thanks for that introduction, Cache. And you know, one of the things that I hear often from audiologists in the clinic or those that come to my fitting workshops is that they are under increasing pressure to be more efficient as in their clinical practice. What has that been like for you at Utah State? Yeah, thanks, Robert. This is actually a real consideration for everybody at our university setting.

We are not immune from that either. We have to balance, first of all, the patients, they need to be seen and they need to be fit properly.

They need to be. Let me back up here.

Thanks, Barb. This is actually a really important consideration for everybody. We are not immune from it at our university setting either. We are constantly trying to balance the patient's needs and the clinic's needs. The patients, they need to have their cochlear implant programMed, and they need to be able to hear and receive best practices in a patient centered care environment and to get the best possible outcomes that they can possibly get.

We also need to fund the program. We need to be able to, in our university setting, train the next generation of audiologists. So we kind of have to meet the needs of everybody. And so we are constantly looking at how can we balance making sure that we are doing all of that as efficiently as possible while also not sacrificing any of the outcomes. Absolutely.

I think it's a challenge that many people face. And today we're going to talk about how you've implemented ESRT before we talk about anatomy based fitting. So, Kash, in addition to ESRT, you've also implemented anatomy based fitting, and you've been partnering with manufacturers for helping and counseling your patients. How has all of this overall impacted your clinic efficiency? Yeah, these are some things that we rely upon greatly to help us to be able to maximize the patient outcomes, but also be as efficient as possible.

For example, I now routinely do ESRT at activation. We know that we can't do it on every patient activation, but I'm trying it as much as I can at activation, which ultimately is eliminating one to two visits in there just from doing an ad activation. I regularly find that I'm successful at getting ESRT and at least making a program that they can use that reaches their targets that were obtained by ESRT. Having an anatomy based fitting protocol on board. Boy, my difficulty to fit patients, it has completely eliminated some of those returns that where you just can't figure out what are they trying to explain to me, or they just aren't happy.

And so it's eliminated a lot of those unnecessary appointments in my calendar and just being able to refer to patients and partnering with manufacturers and say, I need some help here as far as answering questions, helping with equipment, et cetera. All of those have allowed me to have more time to have direct face with the clinic and with the patient, which ultimately gives me a chance to counsel with them, answer their questions. Someone's spending less time programming and actually helping them to hear and understand better, which I think is so great because, as we wwell know, a lot of that counseling and going through the equipment kits and things like that, or relying on their interpretation of what sound sounds like takes a lot of time. So we're definitely, and some of it's not reimbursable, right? So we're definitely, as manufacturers, happy to partner with you as wwell.

Now, getting into ESRTs, I know that you've been doing this for several years. How did you get started? Boy, you know, I started doing ESRTs probably in about 2010. And the way it happened for me was early in my career, which is the beginnings of 2000, I had heard about ESRT, and you have to understand, it was also reported back in the late nineties. So it had been around for a handful of years.

When I started my experience of cochlear implants, I asked our clinic, why aren't we giving this a go? And the answer I got was, not everyone has ESRT. You have to have normal middle ear function to do ESRT, and you've got to have your special equipment, and you have to be an octopus to do ESRT. Now, this sounds familiar, right? To a lot of people.

I hear this a lot from other people now that I've been doing EsrT for so long. I hear those, and we'll address that a little bit later also, how to overcome those. So I continued to do my loudness scales that I've been doing. And then along came space like art, NRI, nrt. And then Jace Wolf happened to be visiting our clinic in about 2010, and he challenged me, said, sketch, just give usrt a try.

Try it for one month on your patients and just see what happens. And immediately, I don't know about immediately, but really quickly, I started to recognize that ESRT was superior to what I had been doing, which was mostly loudness scales. And I found really quickly that people were preferring a map that was based on ESRT. And I also found that some of these complaints that they had pre, when they came in, I was able to resolve some of those complaints by doing ESRT well. I became a lot more confident in what I was experiencing.

And so I just, at that point, set out on a path of just doing ESRT on everybody. One of the main things I liked about ESRT was that the more confidence that I had in my results, I became more confident in their user settings. And then I could say to them, this is our target program. I want you to go out and give this a go. So instead of going live and playing around with their settings, I began to say, let's just give this a try and see what happens, and we can modify if we need to later.

Finding out that they rarely were coming back in because they were happier with the ESRT based map than they would have been making the changes that I would have made otherwise. So I'm kind of a data kind of a person. I like to keep track of my data. So I was doing SRT on absolutely everybody, and I kept track of every bit of data that I had. Well, after doing that for several years, I all of a sudden had all kinds of data.

And that led to a project where we published the paper on the long, long term stability of ESRT. And as a training program, our students always engage in some kind of a project. And this particular student needed a project, and I had all kinds of data. And so we took a look at what is, what happens with ESRT over time. And even though I like data, I'm not a writer and I'm not a researcher, but.

So it took me a long time to publish the data. So it took me a few years to actually publish the data after we finished the project. But what we found in that paper was that ESRT really, truly is stable over time. We also found that the measurements are reliable and they're repeatable and that they're typically listed below their UCL.

It also helped us to establish, what is the relationship between ESRT and MCLs? Wwell, Cache, one of the, this is one article that I've been referring to when we routinely teach about ESRTs on our audiology fitting workshops. And I refer audiologists to this often, and I think it's very valuable because it shows correlation between ESRT and map levels across three different manufacturers. And you can see here with manufacturer three, which happens to be Med-El, that it shows how wwell the ESRT correlates to the maximum comfortable loudness levels that we recommend being set for MCL for our Medal recipients. And so what a great correlation, and I like to explain it to the audiologist, that when you know where your target is, it's definitely easier to hit than having to rely on some of your patients to report.

And we all know that not every patient is a reliable reporter. So I think this is a great correlation. And just to make a note here, the n here, over 205 patients is the number of electrodes that you measured ESRT on. So you can see you have a lot of data, just like you said. And then the next graph I like to show is the correlation with final map levels across manufacturers.

And you can see, I'm going to specifically talk to Med-El is how tight that correlation is between their MCLs and where their ESRTs are. And so it's, I think, an easy thing to implement, something that people should be doing if you have that possibility. And definitely we want to make sure that it's a reliable, it's objective, it's repeatable, and it's also applicable to your regular fitting maps.

The other thing that you mentioned is that ESRT levels should remain stable over time. And then you can see here of how stable things are over time, especially on the right hand side, where you can see small changes, but really something that you should be reliable, repeatable, and stable measurement for those patients that come back to your clinic.

So, Cache.

A lot of audiologists that I talk to say they kind of shy away from doing ESRTs because they think it might add too much time to their agenda, or they don't think that they can work the admittance bridge and the programming computer at the same time. What's your experience been like? Yeah, you know, that's. Those are. Those are real comments that I hear as well.

Pretty common comments, actually. And I actually find the exact opposite, that I am a lot more efficient because of ESRT. We also have to understand that ESRT is an objective measure that gives us a target. So this. It would be like doing speech mapping, really, or for hearing aids.

We know that those are best practices, and when we hit those targets, we know that the patient is going to perform better. They may have some complaints, and we can counsel them through those complaints and fit them to target.

I find that when I, especially after I got used to doing SRT, you've got to get through that learning curve, right? That's just anything you do. You got to get past that learning curve. Once you get past that learning curve, I can get through ESRT and be wearing a live map in less time than it takes me to kind of go through asking them for their opinions and their feedback on what they're hearing. So it eliminates that indecisiveness, that uncertainty of what they're hearing.

Are they balanced? Are they not balanced allowed? Is it a too loud, um. But what it's. It's done for me is that especially with Med well, I speak to Med el here that, um, I can easily comfortably schedule my bilateral Medial patient in 1 hour, and in that 1 hour I can complete ESRT on both ears.

I can get aided tones, and I can do a to speech discrimination on both ears. Um, I typically plan on if I'm, uh. Uh, I typically plan about ten or 15 minutes to

complete ESRT on a bilateral Medial recipient. That after you've got passive learning, learning how to do it, it goes well. So that time question is no, you will actually be saving yourself some time by doing SRT.

And that other comment of I feel like I don't have enough hands to get around. I recently had a couple of experiences. Barbara's about one, but not the other. A few months ago, I had a bike wreck and I broke my collarbone and I was doing ESrT with one hand going back and forth. And so I can appreciate the feeling of, I feel like I need to have a whole bunch of hands, but I was able to do it with one hand, and now I'm back in that same situation.

I've got a broken hand again right now, and I'm back. So I'm getting plenty of practice with that. But it really, truly does. Even with one hand, I am faster doing ESrT than I am with you trying to get a subjective measure out of them. Well, thank you for sharing your experience, and I'm pretty impressed you can do it with one hand.

I know what I often recommend to clinicians is, hey, the first time you try it out on recipient, try and ask your Med el rep to come in and help you. One's going to work the computer and one work the admittance bridge and then try it out that way. Or maybe you have a fellow audiologist or even a student that maybe can help you out. The first couple times you do it. And I agree, the first time I did it, I felt like I needed five hands.

But very quickly, once you know what you're looking for and know how to get it, very quickly, become comfortable with it. So. Right. We do the same thing with our students also, where we'll have the students participate in part of it until they can take over all of it. So that's a great, that's a great recommendation.

And, you know, one of the things that I often refer to is your YouTube video that you have on YouTube, which is linked here, and I think you can just search YouTube ESRT and find it, which is a great visual representation of Maestro and the temp star looking for your deflections there. So it sounds like you've also done a lot of teaching yourself Cache on teaching others how to use ESRT. Yeah. So after I accepted the challenge from Jace, I found myself doing it all the time. And just the more I talked about it with people locally around here, I started

to find myself consulting with other people around the country and around the world, actually.

And I also wanted to make sure that my students had access to a resource that they could go to when they were not in my class, in my clinic with me. I wanted them to be able to leave the university setting and go out and experience doing ESRT. I made in collaboration with one of our students on how to video and how to do ESRT. And what started out as a project for my students here at the Utah state has actually benefited a lot of people in Ulrik. There's a lot of hits on those videos, so I'm glad that those have been able to be of some use to other people.

Now, I have also only tried it on the GSI Timistar pro. It looks like that's the admittance bridge you also use. Have you ever tried it on a different admittance bridge? Yeah, you know, I have tried on other admittance bridges and it works just fine on other bridges as well. I just happen to have the Timistar pro.

That's just what we have in our clinic. And so that's my frame of references as well. But by all means, this is not subject to the equipment that you have. So it will work with whatever equipment you happen to have on hand.

And as far as my experience with how I do ESRT from EDL, I do Esrt from Edel in the ESRT task screen and I absolutely love that I have that task screen. It records ESRT over time. I can refer back to them over time. The other thing I like about it is it's not subject to any changes that you make. If you make any changes in the fitting screen, any parameters in the fitting screen.

So ESRT is your ESRT. I also from Med-EI, I find that what works best for me is to leave the machine at the default of 226. And I find that most of the time I'm able to get a response for my Medal recipients. If I don't, then I will change it to 1000 hz. However, that is not very, very often that I see that.

I agree. I think this is a question we get often at workshops is which, and there's been some debate out there about which probe tone to use. And I have found as well that just sticking with the default of 226 hz is typically just fine. But then if you don't get ESRTs, then you can try a different probe tone. And so that's typically what we recommend as well.

So I know you've got some tips and tricks here and I think it's some of, some of them we also talk about, which is, I always say if you have a recipient who hasn't had surgery on an ear, try that ear. What do you do in your clinic? Cash. Yeah, you know exactly. If you've got a patient who's had surgery on both ears and it's kind of, well, both ears have had some effect.

Right. But if it's a patient who has only had surgery on one side, then I am likely to start on the contralateral side, especially because I'm doing ESRT activation. And so we really have no choice but to do it contralaterally. And I find that I just tend to stick with it in a contralateral position post activation as well. And if it's an SSD patient, you know, they've got a normal cochlea on the other side.

So I just always jump right to contra for now. All my SSD patients and you know, one of the, I think you said that you do ESRT activation typically, and so it looks like you use an ascending approach rather than a descending approach. Is that right? Yeah, I do and I do. And I treat it a little bit differently than I would for a post op.

So I might start in the middle of the electrode array for an activation. But for all my follow up patients, I will typically start on channel one and I will start below where I had a previous ESRT and ascend up until I get a response and then move over and I just free from Med L. I do ESRT on every single channel and just go through it. Start from one end, I go to the other end. You can hop around across the electrode array if you want to.

I've heard of people skipping electrodes, coming back and filling in. I find that I'm very successful if I just start on one end and just go right to the other end and get great responses. I really like in the ESRT screen that I can mark my ESRT easily, just hit r and I've got it recorded and then I can easily access that data from when I'm in the fitting screen. I agree. I think it's so nice to see those hashtags that we'll show in just a little bit when you pull it into your regular fitting map so that you have your target visualization visually displayed and you know where to go from there.

So it looks like, you know, average fitting levels for Med-El recipients, especially on day one, is usually between ten and 15 charge units. So tell me how you do

it at initial fitting and where you start. Yeah, so, you know, after I get ESRT, I will typically start about ten charge across the array also. So I lower everything down until it's about ten charge so that it fits the configuration of the ESRT, and then gradually go live until they say, okay, that's enough. And then I'll let it be at that level where they say, stop for a second and just sit there and visit for a little while and just talk.

And then I'll just kind of gradually just push them. And the biggest one where I find that they need a little bit of time is that very first where they cry uncle and I've got to stay there for a little bit longer. And then once I go up a little bit, they realize, oh, I actually can tolerate that pretty well. And I find most of the time that I can get up to ESRT, especially for my SSD patients, and they usually get there within a matter of a couple of minutes. Whether at ESRT for a long term hearing loss, I might need to be a little less aggressive with them and give them a little more time in between each push up.

And I also recognize that for my long term hearing loss patients, they might actually need to have some progressive maps, which is just fine. However, what I've got is the target. And so I can still avoid that day two activation because I know I've got that target. And as long as I'm feeling very comfortable that they know how to increase the programs, then I'm comfortable saying, you can come back later instead of coming back tomorrow. That's great.

So, you know, again, one of the responses we get when we encourage audiologists to do ESRT is commonly they'll say, well, I think it's going to be difficult to keep kids still when I'm trying to do the ESRT because they need to stay still to keep that probe in the ear. So how do you work with kids? You know, I love that comment because I get that comment a lot, even from my adult patients who are recipients. And they'll say, oh, man, how in the world can you do this with kids? And my response typically is, boy, it's a whole lot easier to do it with kids because if I turn on a movie and put it in front of them, they will not move.

They just sit there and they stare at it, and they actually sit still. So much better than my adults who reach up and scratch or do something or kind of look at the screen. The adults, I find I have the hardest time sitting still over my, my adults.

So with the kids, make sure they're doing something interesting. Give them a movie to watch, um, if they're comfortable on a parent's lap.

I find that most of the time they do better when they're sitting in their very own chair, um, just watching, watching a movie. Um, adults, I invite them to read, um, use their phone, like playing a game or something like that. Um, or sometimes I'll have them sit and watch the impedance bridge with me and just sit there and watch that line, and I'll explain to them what I needed this line to be solid. Whenever you make a, do something like that, then that affects my baseline. And so that sometimes will help them to kind of sit still like a statue.

Some other things that I have found that have, have improved my efficiency over time is that, that, you know, when they come back, they're using the same probe chip every time. If there's anything away from default recording the chart note, I just am at the point now where I have a workflow in my chart note. That is, what are the parameters used for doing ESRT? And I record what probe tip size I used, which year was the recording earth. I record if the probe tone frequency so that the next time they come in, I don't have to reinvent that wheel.

I've already got it going there. That's a great idea. I love that. And you could even record that in your session screen in maestro. So I think as long as you're writing it down, that helps you the next time or even another clinician see the recipient as well, right?

Yeah. And one of the things that I, a trick that I recently learned, and I absolutely love this trick is using earthworld impression material. You know, you have those probe tips that keep pushing themselves out, and you're getting up and going around and pushing it back in. You go sit down, you do a couple of presentations, you have to get up and go, yeah. Putting some impression material in there and just kind of anchoring that probe tip in there.

It is absolutely amazing. So that's another thing that I will record in my chart note. If I needed to cement it in that, I just record that. And the next time they come in, I just go for it. Don't even use the time.

I just get it done and then I can just go for it and be done. That's great. And so here's the screenshot I mentioned talking about in maestro and pulling in. If you

do ESRTs in the fitting task, you can pull in those markers in the session of the map that they're using. And you can see it here.

Just that orange arrow is pointing to these orange hash lines where the ESRT is. And so here you'll see that the MCLs are matching ESRT. And is that typically where you set your Cache? Initially, yeah. My data showed that it's a little bit lower than ESRT, but I think that was most of the time.

The reality is I shoot for having them start, although with an exception that I'm discovering here is that some of my SSD patients actually like their MCLs to be fit higher over their ESRT. And I tend to find that a little bit later than day one, but one month to six months, somewhere in there, they tend to say, I want my implant side to be a little bit louder so I can feel like it's more balanced. So that's a relatively new finding that I'm experiencing. I think it's a great way to start is at ESRT. And because there are different settings with the fitting map versus the ESRT task, you may see some variations in the MCLs and the fitting task versus ESRT, but I think starting there is a great first step.

What specifically, has this impacted on your clinical schedule? Yeah, well, so, first of all, I'm spending a lot less time actually programming. I'm spending my time actually talking to the patient, giving them some. What does the map sound like? Giving them some counseling on what to expect, et cetera.

It's also allow me some more time to spend in the booth doing some testing.

I am not seeing people very often. I am avoiding a whole lot more follow up appointments because I'm getting a target map quicker. Really, it's about I'm spending less time with them and fewer appointments with them.

And I think that if you can, as we said before, getting to your target sooner means that you can then spend the rest of your visit doing speech perception testing or counseling on listening exercises or their backup processor or other accessories. So I think that's terrific. Another benefit is also that they, they're happier with their implant faster, they're getting to their target, what they're expecting sooner. And so it avoids those follow up appointments where they're just like, I'm not understanding very well because you're so far away from target. Yeah.

Wwell, that's a great takeaway. We all want happier patients, and I appreciate you sharing your examples, and we're going to change gears here to talking about anatomy based fitting. And this is one of the most recent tools available from Med-El in conjunction with the Otoplan software. And vanadium based fitting specifically refers to having the patient getting a CT scan postoperatively and then finding out where those exact cochlear implant electrode contacts are sitting inside the cochlea, and then using that information by importing it into maestro with a simple click of a button, shifting those frequencies so that the contact, we are matching where the contact sits to where the frequency is responsible for that particular contact. And so if ESRT is the GPS or your target for loudness, anatomy based fitting is the target for pitch perception.

And this is something I think you're one of the early adopters Cache of starting to use anatomy based fitting really in earnest last summer. So what has it been like for you and how has it changed your clinical protocol or flow? Yeah, so, you know, I got pretty excited when anemia based fitting first became an option. And the surgeons that I work with were also really supportive of let's try to optimize a patient's patient's mapping experience. And so I set out to try to do ESRT and anybody's fitting on as many people as I, as I could because I wanted to get a good gut sense of how to do it.

Like with ESRT, a common comment that I hear is, I'm going to reserve ESRT for those people that are just difficult and therefore, I don't get the much experience with them. And I wanted to have the experience of really, truly getting a feel for what is it like. And so I set out with a goal of trying to do it as frequently as I could. And I have found that I'm talking about anatomy based fitting with just about all my patients either before they have surgery or my patients who have already had a cochlear implant and following up. And so there's that.

There's the concept of the difficult to treat patients. So when I first heard about anatomy based fitting, my mind went to those patients that were just, really, just difficult. The ones who come in all the time, the ones who have these complaints where you just cannot understand what it is that they're trying to express to you because you can't hear what they're hearing and they can't express to you what it is that they're experiencing. And so I identified a couple of those and came home from a meeting and said, these are the people that I want to target, and

specifically reached out to them and asked them if they'd be willing to give it a try. And I'll talk about them in a little bit in this presentation here.

So, you know, Cache, you know, you speak to some of the foundational challenges of clinical audiologists is patients who are doing well on paper, but maybe they're not happy with what they're listening to. And those are, those are things that I think we don't often ask long term with our recipients and can cause them to follow up, and they're just unhappy with what they're hearing. And I think that's difficult for audiologists to really interpret when they have very vague descriptions of what it sounds like. So I think using objective measures, especially in those cases and with this new tool, is a great way to start.

So tell us a little bit about how you got started and what you've learned so far. Yeah, so I was at a meeting, and this was a few years ago, when we talked about anatomy based fitting. And we have a small clinic, and in our small clinic, we didn't have the ability to purchase a license for the Otoplan. And you know what, the number of people we're like, I don't know, that's really very feasible for us. But then a little while later, Med El offered autoplan on demand, and it amazed fitting on demand.

And then it was the, okay, this opens up an opportunity for us. And so over a year ago, just over a year ago, we said, let's give this a go. And I started off with these two very difficult to treat patients, two that were just very unhappy. And then I said, I'm going to start doing this on all my new recipients. And then as I was doing with all my new recipients, I said, well, what about all my people who have their cochlear implant already?

So we started incorporating all of our experienced users. And like I said earlier, everyone who comes in, I just talk about it. Here's this new thing. Would you be interested in trying it? So I've got a mix of adults and teens.

I don't have any children yet, but that's more about opportunity, not because I've specifically said I don't want to. It's just been because of my clinic load. It hasn't been an opportunity yet. One of the things that we often talk about is with anatomy based fitting. If you're going to do one, we definitely, with the new recipient, we want to get the right electrode for that person's cochlea.

There's a lot of patients out there that have been implanted before this software was available and so it is definitely possible to use it on both new patients and your existing Medall patients. And so it seems like you've had experiences with both populations. Do you want us to dwell what they say initially? And then I know we've got some case studies coming up. Yeah, yeah.

So this is where I get a little bit excited about this. And I really like this. This is, for me, is just a lot of fun. So comments are very similar across the board with my patients. When I turn on the program that is made with an anatomy based fitting protocol, everybody has said it sounds deeper, it's got a lot more base than it did before and that's universal.

I just expect that to be something they're going to say. And so now I actually just counsel them from the beginning that it's going to have more bass quality. It's just going to give you that more depth to your hearing. I hear comments that it sounds like natural hearing, and what is most impressive to me there is that these are people that have single sided deafness and so they're comparing their natural hearing ear with their cochlear implant. And while they still say yes, it is different, it does sound much more like natural hearing than it did before.

So I've got that. I introduced this with a couple of people that were difficult to fit.

This is a representation of how much this is going to help us. The one patient who was probably my most difficult patient, who was emailing me regularly and wanted to come in regularly to work on his map, we fit his anatomy based fitting maps over a year ago and I have only received one email from him and it was only to dwell me how much he absolutely loves his new programs and doesn't want them to be touched ever again. So that has avoided a lot of appointments and a lot of frustration. I like the man, he's a good human being. But boy, his shirt is nice when they don't come in all the time, right?

Because it's that sense of helplessness, like, I cannot help you, but this is a, we've actually accomplished this for him. The other person that is difficult to fit, he actually so far has rejected an enemy, is fitting map. And we'll talk about him later again, also. Well, I think it's an important point that you bring up Cache, which is for those patients that are unhappy or can't describe what they're

hearing, and they come in all the time. This allows you to make decisions based on real data without having to make a lot of guessing.

So we're taking the guesswork out of fitting pitch to where the place is of that electrode array in the cochlea. And it may not be the solution for everyone, but I think it's definitely worth it if it's a solution to try for some of your patients. So you've had a few challenges at your clinic. Tell us about those. Yeah, and we're still working on this.

And, in fact, we're in the process of working on some of this fine tuning as we speak. But probably our biggest challenge is coordination. So because we don't have a physician who is on site, it causes a little bit of a delay in accessing the images, and we are working on that. And how do we team up with, actually, that Med EI helping us out there and our reps? And so it actually, we're in process of making that improve significantly.

And then the other challenge is just kind of making sure that we are coordinating ourselves, so being very aware of when a patient is coming back and that coordinating that there are several steps you've got to take in there, and so just being aware of them. And like with everything, right, there's this learning curve. And so the learning curve initially was, it felt like it was occupying more time than necessary. However, now that I'm into it and there's a good system going, it really is not intrusive in my schedule at all. The other challenge that I have is the quality of imaging, and the imaging has to meet certain criteria in order to be able to do an IB's fitting.

And I would say that as long as we are sending patients to a modern, large facility, we rarely have problems with imaging. It's those very rural centers where they might have older technology that we don't get the quality of image that we need to help with that. Med EI has a great handout that we just send whenever we get a referral for imaging, that here. Here are the standards that we need to meet in order to use this technology. And so that does help also.

And I will also send a patient with that so that the surgeon sends a referral with the requirements, and I send it with the patient, say, here's just to reiterate, this is what they need. That's great. And I hear that from other centers as well, as it can be a little tricky to get everything in place, but once they get it in place,

things to run pretty smoothly once all of the pieces fall into place. Well, let's dive into some of your case examples here with your anatomy based fitting. And this is your first patient.

Tell us about this patient. Yeah. So thank you. This is where I get excited because this is just fun for me. I really like being involved in this process.

So. Excuse me. Patient a. This is a young woman who had a scuba accident. And she was in her ascent and her ear got plugged.

And then she noticed she wasn't hearing anymore. And so she was treated Medically and without success. And so she had a CT scan and plan evaluation in March of 23.

At that point in time before she had surgery, when I saw her, she was at the point where she was experiencing the typical effects of having some single sided deafness, but she was also experiencing some depression, some fear of I don't want to go scuba diving, and just those typical withdrawal symptoms. So she had surgery in July of 23 with an activation of just a couple of weeks later in August. And then we fit ESRT. She was fit to ESRT at activation. So she left my office that day wearing a map that was at Target.

We had one program that day and she walked out of the door wearing her target program.

And we implemented a 90 day study protocol at the end of that month. And you see, we got a pretty good angular insertion depth there at 567 degrees. Yeah. And I, you know, for. We've got some additional audiology online webinars talking about angular insertion depth.

And we're really trying to get to about 600 degrees. So this 567 is not too bad. We're getting into that second turn of the cochlea. So I think that's pretty great. And then this is what her fitting map looks like.

So this is, the blue dots represent exactly where that electrode is sitting in the cochlea. And then those bars are representative of where the frequency boundaries are in relation to those electrode contacts. This looks like a pretty good match to me. Yeah. Yep.

She's pretty, pretty good there. Pretty close.

And then what did she say? Yeah, so this is the way that I like it. So when we first activated it, she was like, huh, okay, I'm not sure that really sounds a whole lot different than what I had before. But then she went home and she came back for a subsequent visit. And she said that after I got home and started listening, wow.

It became apparent that it really was different. And the longer it's gone, the more normal it sounds to her. And continually as time goes by, it just sounds better and better and better. I recently saw her and she again reiterated these exact same things, that it just continually gets better and better and better. And it just sounds quote, normal.

And that's pretty amazing, considering she's got a normal ear on the other side. So let's see what she has to say about it herself.

I think all of that huge difference. I can't believe the difference that the CT scan adjustment that we did when we were in here, I couldn't really tell, but when I went home, it was so apparent, really. And it was so good compared to before. Like, it sounds normal now. Like, yeah, it doesn't sound like before.

I didn't even notice. Like, it's all just better than nothing, but it sounds like.

And, barb, I should. I should preface this here. These. This is not staged. So, because we're a training program, I record all of my sessions and I keep them just to have.

In case I need to have a training moment with the students. And so this truly is just her just casually talking about her experience. So this, for me, makes it even better. This is not a contrived situation. This is her just casually just chatting.

In fact, this will be the case with all these videos that we're going to see today. That's amazing. All right, let's move on to another patient. This patient. Patient p.

Twell us about this one. Yeah, so he had Meniere's disease. It was identified in 2018 at age 41. He came in a few years later for a candidacy evaluation and ultimately had surgery. About three years after he was identified.

He had had his device for a couple of years. He's one that came in for routine follow up programming. And I just said, hey, there's this cool new thing out, and might you be interested? And he said, of course I'd be interested. I always want to see if I can make things better.

So we went ahead and got a CT scan, and we implemented his fitting there. And so you see, he's really close to that 600 degree mark. Absolutely. It looks like he's got his CDL of 33. He chose a flex soft, which is 31.5.

So that's what I call really good cochlear coverage there. And then if we take a look at his fitting map, those dots are almost exactly in where those bars should be. And twell us about what he said. You know, he had a pretty similar response at first. It was like, I don't know if I really notice a difference.

And what I ended up doing with him was I went back his old map. I tend to say, hey, let me make a bit of a change here, and I'll see what you think about this. I went back to his old map and told him that this is your old map. And he was like, what? That's what I was wearing when I came in the door.

No way. So now he says it's got more tone to it. It's more noticeable than he remembers experiencing. So I think he might actually express this. I might have stolen his thunder here.

All right, let's see what he has to say. Can program let you go before, after? You know, kind of like Tom trust. Yep. Exactly.

One. Number two. So right now it's on using. It's called the anatomy based programming. Right now, here, this is what you were wearing.

This is what you were wearing when you came in the door. And I'll talk to you again for a little longer here. Do you notice a big difference? Yeah, I guess. Yeah, there's a big difference.

Really? How was that different?

I hear more tone in your voice with the anatomy base. With the Atana? Yeah, for sure. Okay, go back to it. Yeah.

Okay. All right, so now it's back on. Give it a second here. And there you go. Now it's back on.

I'm not totally sure what the sound quality is going to be, but it definitely sounds different. Yeah, like there's a. There's a more noticeable difference. You know, all the, like, program changes that we've been doing along the way have been. Let's see, like those changes have, you know, been noticeable but subtle.

This is quite a big change. So what exactly is.

I love these videos. And you can tell that he definitely has noticed a big difference. And you know, what he said, Cache, was, there's more tone in your voice, but if someone came in saying, I want your voice to have more tone, how would we know how to address that? Right, right, exactly. It doesn't have a lot of meaning.

So I'm glad for him that I had more tone. But how do we affect that change? Right, exactly. Which is why it's so valuable to try these new tools. Let's talk about patient D.

Yeah. So patient D is a teenager now, and she was identified with hearing loss later because she had hearing loss, secondary HCMV with a progressive loss. So she had bilateral surgery in November of 15 at the age of four. And she's got a flux 28 in both ears, which was, I believe, the longest electrode at the time that we did that. And so she liked the other one.

She was in for routine programming, and it was the exact same scenario. Hey, there's this new thing out there. Would you want to give it a try? Of course we'd want to give it a try.

So it looks like she's. And of course, she was implanted before Otoplan was available, but we can see after that. She's got a CDL of 32 mm on the right and 31.8 on the left. Similar, but not exactly the same. And she had flex 28 implanted, which was the longest flexible electrode, reflex series electrode at that time.

And looks like we've got about 500 degrees insertion depth on the right, about 584. So longer on the left side. Not quite into that second turn on the right side. And then these are the fitting maps. You can see the differences, which is the gray bars are the default frequency allocation.

And then the colored bars are the right and left for how nanomy base fitting was changed. And I think she has a very interesting reaction. Should we just go see what she has to say? She says, okay, kiddo. So this is the new program.

Does it sound different? What does it sound like? Lower pitch. Yes. You know what?

That's exactly what we needed it to do. So does that sound weird? Yeah. Like uncomfortable weird? No, it just seems weird.

Also funny. Clearly funny because you're laughing. Yeah. Yeah. Okay, I'm gonna ask you some questions.

Okay? You ready? What is your middle name? Emma.

How do you spell Emma? E. M. M. A.

Good. What is the space called between your big toe and your middle toe? What? What was the question? What?

The space between your big toe and your. Good. That was so long ago, but I couldn't remember. That's good. I have no idea.

It's your pointer toe. Yeah. It's your pointer toe.

You know what I love about that Cache is, you know, this is all really anatomy based. Fitting is all about pitch, right? So we're targeting pitch, and we know that this is not really about speech understanding. It's really about sound quality. And so you can clearly see that she's getting open, set sentences right away from an understanding.

And have you heard back from her since you've had this fitting? Yes. So, actually, no, I have not. She's on my schedule here coming up soon, but I haven't heard anything. And when they.

When they left, I had a discussion with mom about how do we want to move ahead. Do we want to move ahead with her only with only the new program or to have one of each in there and counseling about it? We decided that we would only send her home with one program. So she went home with the one program, and I have not heard back. So in the amount of time that she's had this program and she's not, I've not heard back.

That's good news to me, that things are going well for her and especially programming with a teenager. We all know those can be tricky appointments. Right.

So we're on to patient b here. And that is. Tell us a little bit about this one. Yeah, so he is the one that I referred to a little bit earlier where he's this nice guy, but in all the time, constantly emailing me about how his program doesn't sound right. So you'll get to see firsthand what he has to say here.

But he has history of bilateral otosclerosis stapedectomy. So right away, right off the bat, we know that we're not going to get Esrt. We can't get Esrt on him. So it's really truly depending upon him and what language he can use to tell me how he's hearing. Um, he had only want a hearing in the left ear, um, and he had a flex 24 and a flex 28.

And what his. His complaints that he was always talking about was, I. I hear like, you're in a tunnel. I'm in a tunnel and you're in a tunnel. It just sounds garbled.

I can't understand my wife. And then he'd say, like, the bass was so overpowering that he couldn't hear the melody in the hymns of the church, that the organ just sounded like it just was just full of bass and overpowered everything else. So those were. Those are the complaints that I heard almost every single appointment. And that can be frustrating because, as we both know, how do we address those, especially the garbled speech?

How do we make decisions based on what to change there? So it definitely can be hard to pinpoint exactly what they really mean when they say things like that. So with this patient, he has a 24 in the right ear and a 28 in the other. Look at how long his cochlea are, which is 37.9 round window and 39. We're getting about 500 degrees insertion in the right ear, a longer in the left ear, and then this is where his fitting maps are.

So you can see some of the changes here.

And then tell us about this, especially because he was so unhappy with his performance or his sound quality before. Yeah. So he's going to talk about some of these right here. But what speaks the most to me is that I don't hear from him anymore. He is not on my clinic schedule other than just for his routine, regular follow up appointments.

So that speaks volumes to me more than anything. But let's. Let's hear what he has to say. Okay? Yeah.

How's it going? Oh, it's wonderful. The best I've ever had. It's just good, huh? Well, the hard part to get used to what you probably explained to her.

I don't know. Anyway, the hard part for to get used to. Everybody's still very, very deep voice. Okay. I'm even very, very, very deep, but I'm not in a tunnel, and I'm not underwater.

garbled. And what's nice about it, as you speak, as you form your speech, I can tell what you're saying. Before, I could never do this because I could not understand. So watching conference, I can follow their faces and know exactly what they're saying. Good.

And this is. I still miss a little bit. There's just certain. But it's been great. I mean, other than it's deep.

It's a deeper sound. I don't have that pitch. You know, like we were trying, and I still struggle with my wife once, or we could never tune her in. Her pitch was just. Yeah, but it's overall, 99%, 100% better.

That's all. The only complaint is this thing doesn't always stay charged. And this, you know, it's probably a new time to just get hooked up, you know, before they run out again, just get new ones. But. But no, what the computer picked.

You know how it picked all that and you hardly had to. To do anything. It was good. Yeah. And see, just reading on the phone like you told us to.

We've gone through all the last conference, you know, just. And reading the scripture. I just have. But I can understand. Okay.

Awesome. Accents. A little struggle with that. Yeah, but much better. And so if we went way back in history, you could read a.

It's been a struggle. Yeah, but no, but having that done, like, you know, we experimented with it. Wonderful. Good. It's a different.

Like I said, it's deep. But I can also. The organ, they're not. I can follow a melody now. Wwell, I can follow.

I don't know if it's the true notes, but I can hear the other. See, I couldn't before, and I always tease them in church. Get your foot off that pedal is Bob. That's all I heard. I couldn't twell where they were at because all I heard was a deep sound.

And that's gone. It's gone. Oh, man. And so now, for me, it worked. Yeah.

That's awesome. I can't guarantee periods. Yeah. This is what's great about him. And I love that he's just so easy to follow there now.

Wwell, it sounds like he's so happy and that is so great because it was something that's hard to pinpoint where to make the changes. And like you said, he said with the one click, just the computer decided and it ended up with a better sound quality. And I think that we all want happier patients. Right? Right, exactly.

All right, this is our last patient, I believe. Yeah. So this is patient g, and he's the second patient that I referenced earlier that he was one of the two that I targeted and said, here's somebody who just is constantly complaining about their programming. Let's see if we can make a life better here a little bit. So he had a moderate to moderately severe loss and then a sudden drop, no hearing in his right ear.

And that happened back in 2014. So he was implanted with a 24 in that right side in 2014. And he has always, always complained about poor sound quality in the right ear. He complained that he wasn't understanding very wwell. Now not understanding very wwell.

Look at his scores. He could be doing better. Right. But still, those aren't the worst scores in the world. But that's also, that's where he was.

He always preferred his left ear, which was his hearing aid ear. So it was hard because he always said, I want that. I want this to sound like my hearing aid ear does.

So then I. What happened in his CI journey? Yeah, so after we fit the anonymous fitting protocol, because I came back from that meeting and said, I want to get him fit. So he talked about it and he immediately just did not like it. It was not a question of maybe he wasn't.

I don't like this. Wwell, what I've learned with using objective data is that, and patience, you sometimes just need to get used to things. And also they needed to be doing some rehab, etcetera. So I said, hey, let's just let this be, let's let this go for a month and let's get our rehab going and let's just see what happens. Wwell, so during that one month, he really didn't do wwell.

He didn't go to his class reunion, other activities, because he felt like, I just cant understand speech. Wwell, then he came back in at one month and he really, truly wasnt understanding very wwell. The moment I took it off, he was understanding wwell. Wwell, was that him? Was that his inflexibility of being able to adapt to a different program because it just sounded different.

Im not sure there, but I havent given up on him yet. Is he just one of those people that kind of gets really just set. I don't know. But we're not giving up on him yet. And I definitely think, based on what you're twelling me, it was worth a try because he was so unhappy.

And certainly this is why we go to objective measures. We want to pull out all the tools in our toolbox to see if we can apply them and see if it works for him. We'll just take a quick look at his parameters. He's got a flex 24 in the right ear and a flex soft in the left ear. And we've got, oh, just 432 degrees in the right ear, 545 in the left.

And then you can see actually on the, on the left side, a pretty good match. But on the right side, he's got definitely a longer cochlea than that flex 24 can cover.

And in those cases, it may be better when you can't apply nattery based fitting just to stick with traditional programming.

And so, as you said, he didn't like it, but you're not done yet. And maybe we still have more tools that we can use to help this patient do a little bit better. But this is, if you can use tools to help your patients do better, then I think that's the most important part. So what's your takeaway Cache in doing this? I got to twell you, I'm a huge fan, so.

But we're taking a look at some considerations here. Right. What can anemone fitting do for the patient? What is the potential there? And it has potential of really, truly changing some aspects for them.

But we also have to consider how do we measure the benefits? Because like we mentioned earlier, Barb, this is not about improving speech discrimination. This is about improving the quality of the program. And so I'm convinced we just don't have the right tools to assess what are they truly getting out of this. So I'm at the point where they're saying it's better.

They clearly say it sounds better. We're going to go with it. So who should be using animals fitting and is it worth doing? And frankly, my response is, we really should be trying. An Emmy is fitting on everybody.

And is it worth doing? Yes, it is definitely worth doing. Wwell, I think that. I'm glad to hear about your experiences and definitely glad to hear about some of your happy patients and completely agree with you, Tash. I think we need some more tools that are more sensitive to sound quality.

And I think as audiologists, we need to start asking our patients a little bit more about their sound quality experience beyond the first one to three months of cochlear implant use. And I think that, you know, Mickey Mouse, as I say, is understandable 100% of the time. But maybe we need to start asking people, does your spouse sound like your spouse or your grandchildren? Right? What does it sound like to you long term?

And to start asking those questions. And I think we'll have those tools as we continue on to get more experience with these new objective measures. So just as a summary, we talked about the overall benefits of using objective measures,

which are they are impartial and quantifiable, reduces the guesswork based on the patient's potentially unreliable responses, allows us as clinicians to make informed decisions based on real data, and can save your clinic time. You can take your lunch break back, so we've got lots of resources available to you on objective measures as well as the two that we focused on today, which is ESRT and anatomy based fitting. Med-El offers quick guides that outline these steps in the maestro fitting software.

You can find additional audiology online webinars from Med-El covering a variety of these topics. Your Med-El team is happy to assist you in getting started applying any of these measures in your clinic, either ESRT or anatomy based fitting. Our Otoplan on demand team can be reached at this email address you see here. And finally, Cash's YouTube videos demonstrating ESRTs you can see online, as well as the article that was published in Otology Neurotology in 2021. So I want to say thank you to our guest speaker, Cash Pitt today for sharing his experience, and I appreciate you listening to this webinar today.

Please contact us at Medall if you have any questions about what you heard today. We'd love to hear from you. Thanks. Barbara.