Optimization of Hearing Aid Fittings with Earmolds

Presenter: Jacob Hall

Hi, everyone. Good morning. Thank you for joining me today. So, my name is Jake Hall, and I'm an audiologist on the education and training team at Starkey. I primarily cover the West Coast. Today, I'm excited to take a deeper dive into earmolds and some considerations on how to optimize patients' hearing aid fittings through that process of customization. We're going to discuss some tips and tricks for impressions, the selection process for earmolds, and then we're going to also go over some modification techniques. At the very end of today's session, we're going to take a look at some case studies and kind of tie in everything that we learned as we discussed it earlier throughout this talk.

Now, a few housekeeping items to take care of before we get started. If you do like to ask a question, you can use the Q&A feature, and at the end of the day's session, we'll try to go through and answer all of those questions. Additionally, there's going to be handouts available, and these are going to be in your pending courses on AudiologyOnline. Or, if you click the link within the chat in this classroom, CEUs are also going to be available for today's session, and these are available with the paid Audiology Online membership. To get those after you complete today's session, you can go to your pending courses and take a multiple-choice exam to get that CEU for today. Lastly, if you do need any technical support throughout today's session, you can call audiology online at 800-753-2160, or you could email them at customerexperience@continued.com. Additionally, you can use that Q&A window for technical assistance as well. This is new to AO this year, but if you've taken any courses on here, you've seen this, and this is just listing the risks and benefits associated with taking these courses. So, something that you can read through.

Now, based on today's session, we're gonna have three learner outcomes or objectives that you should be able to understand after we're completed with today's session. And those are going to include... participants will be able to describe key aspects of a good ear impression. You're going to be able to identify the best style, material, and venting options for earmolds to really optimize that hearing aid fitting based on physical considerations of the patient's ear. And lastly, you'll be able to describe common earmold modification techniques.

So, let's talk a little bit about the benefits of custom products. We really know that the industry has kind of shifted towards open fits being our most popular go-to coupling configuration. But I think it's important to remember that there's many benefits that an earmold can provide, and there's a lot of potential that you can offer your patient by offering them that custom solution, maybe, that they've been looking for. Sometimes it's nice to think of these things maybe from a perspective of a different industry. The way I like to look at this would be, like, if you're going to buy a suit jacket, you know, there's a couple different ways you can buy that. We could go to, kind of, your local department store, maybe somewhere like Kohl's, or the alternative would be, you know, working with an expert tailor to really find that perfect customized solution for your individual and unique needs. And I think we could all

agree that one of these is going to be a much more personalized experience by going to that tailor. So, I think as a hearing healthcare professional, when we offer custom solutions to our patients, we really set ourselves apart from other people in this industry, and we can really offer a personalized product that offers, you know, a comfortable and secure fit. Patients will also benefit from consistent sound quality, you know, a device that is going to be easier to insert and remove with that custom solution. So there's really a lot of benefits by going that custom route, and it really separates you as a professional from others who may not offer that same level of personalization.

So, let's kick it off today really where it all starts, and that's that ear impression. To continue that tailor analogy, this is like going to get proper and precise measurements, so that a product, whether that's a suit coat or a hearing aid, or a different type of earmold, can really be crafted with these measurements in mind to create that personalized solution. We've all had some experience taking ear impressions. Sometimes this dates back a while, maybe this was in school. You know, it could have been during that licensing exam, or it could be currently in clinical practice. I think a couple of things to keep in mind with this, but it's always really important to keep the safety of your patient in mind when doing impressions, but also have that end goal in mind. So no matter what style of earmold you're thinking of ordering for your patient, it's important as a hearing healthcare professional to have a good understanding of the ear anatomy. You know, this would be kind of like driving a car without understanding the roadway or understanding maps. It's not something that you would do. I think the same thing with your impressions, understanding that your anatomy is very critical as part of this task. So, understanding your anatomy is really critical in many ways, but, you know, some of the ways this comes into play is when it comes to making modifications down the road. You're going to know the right area where that modification may need to be made and how it's going to impact the way that it fits in the patient's ear. It also is helpful when you have to communicate to the manufacturer regarding a remake. You can, you know, describe it in terms of anatomy and really can help pinpoint where that problem area is, so the manufacturer can ensure that they can redesign and craft that best product possible.

So, ear impressions are like fingerprints, and really no two impressions are going to be the same. These are all unique. The shells in this picture really show a good representation of different ear canal shapes and sizes. And because every year is indeed unique, you know, it is critical that we examine and assess each ear canal prior to taking a patient's ear impressions. In fact, by taking a good ear impression right off the bat, this can really reduce the number of remakes and ultimately, you know, help patients be happy right out of the gate with their earmolds. So it's important not to take the task of doing earmolds lightly and make sure that we really do it right the first time.

So, this is a great slide, but it says the physical fit really starts with a good ear impression. And, you know, tying it back to our tailor analogy, having those precise measurements is

really critical. And, you know, sometimes we say that this is a lost art. You know, your impressions aren't as common as they once were, but it's really important that we make sure we're taking the best ear impression, because ultimately the ear dictates what we are able to make. We all probably likely have some experience taking ear impressions, maybe that's more currently, maybe it's in the past. But to start out today's session, I wanted to provide some tips and tricks to keep in mind to ensure that you're taking the best impressions possible. So, really, it kind of starts with that impression, and if we receive a good quality impression, we can create an exceptional device. And what this will lead to is ultimately patient satisfaction.

Now, this is an interesting slide, but these are actually comments that we have received at Starkey, whether it's on the order form, or if we called a hearing healthcare professional, but, you know, a lot of these things, I really wouldn't want to hear, you know, like my mechanic or surgeon say. If they were saying these kind of things about their domain, it would make me concerned about their ability to perform their task. So I think as hearing healthcare professionals, it's important to understand that the ear is our domain, and we should really own this space and be confident in us. Now, that said, we do receive many impressions that are not always the best quality, and the unfortunate here is when we do identify that those quality earpressions don't have everything we need, ultimately, we have to call that hearing healthcare professional and ask to get a new impression so we can make sure that we do build a great quality device for you and your patient. And some of the things that we've been told here are, you know, fill up the canal, just do your best guess, build it anyways. So, I think it's important that, you know, we really do our best to get that full picture of the year, right from the get-go, and we can avoid having to, you know, take our guess at these type of things.

Now, if we do get impressions that are, you know, poor quality, and we ultimately tried to build it, you know, this leads to a lot of potential drawbacks. It maybe include poor retention, it could include, you know, poor fitting or protrusion of the device, but it can also ultimately affect that sound direction and venting, too, if we don't have the full anatomy of the ear. And none of these are really going to lead to that patient experience that we want to offer as hearing healthcare professionals, and that's why it's really important to be confident in our impression-taking skills, so we can provide that best experience and device for your patient. As a manufacturer of earmolds, we really want to partner with you in that, but ultimately, it does start with having that great impression. So, you know, we've talked a little bit about these impressions, but this is really kind of that art aspect in audiology, or that fitting experience. And, you know, like I had mentioned earlier, this is kind of, to some extent, become a lost art, but this is something that is part of our domain, and ultimately, you know, we should know how to do this and, you know, be very comfortable with that, because ultimately, we can really only make devices that are going to be, you know, comfortable, something the patient can wear all day, if we all do our part in this. You know, and as a hearing healthcare professional, your part is really getting that good impression from the

get-go.

So, when it comes to ear impressions, there's really five steps that we're gonna take a look at to make sure that we can create a successful ear impression and get the best quality there. Now, these are going to include examining the ear, insertion of the otoblock, taking the impression itself, removal of the impression, and then certainly, last but not least, is evaluation of that impression. And next, we're going to take a look at these steps each a little bit closer.

Step one is examination of the ear. And just like with any good audiological procedure, we do want to start with otoscopy. We want to make sure that there's no blockage or wax in the ear that would preclude us from taking an impression, or, you know, ultimately impact the quality of that impression. We also want to check for any abnormalities or growths in the ear. This doesn't necessarily prevent us from making a custom product, but it is good to be aware of, you know, as we're taking that impression, but also considering what that product is going to be in the very end. And if we do see these, this is something that we can definitely note in terms of the order form. Additionally, we're going to get a sense of the diameter of the ear, which can help with choosing the correct size otoblock. And then, you know, we want to ensure that the ear canal is indeed clean before, you know, proceeding with taking the impression.

Now, step two is insertion of the otoblock. At Starkey, we recommend using cotton rather than foam. A couple reasons behind that, but cotton really allows you to take a nice, deep impression. It's gonna make you lose less of that real estate in the ear. The foam sometimes can be kind of large, but it also really allows you to kind of custom shape that cotton by flaring it out before inserting it in the patient's ear to indeed ensure that you get a good seal. The next step when inserting the otoblock, and this, you know, applies to adults as well as pediatrics, but you do want to make sure that you indeed are bracing your hand against the patient's head while taking that impression. We want to prevent any, you know, damage if a patient was to move during this procedure. Next, we want to guide that block as deep as possible and as close to the eardrum as possible, so we want to make sure that, indeed, we do get beyond the second bend. But the further we can go, you know, within, you know, four or five millimeters of the eardrum itself, is going to give us the most valuable information so we can create that product. And then last but not least, in terms of this step, would be, you know, check your work after you insert that block. You want to make sure you get your otoscope out again, look in the ear, make sure that there's a good seal, that there's no gaps, so we prevent any potential of blow-by with that material. I was mentioning, you know, why we want to choose a cotton ear block rather than foam. And really what it comes down to here is otoblocks, their size and shape can really change, you know, what we capture when it comes to taking an impression. And with foam, we don't have that flexibility, and we see here in this picture that we're ultimately losing a lot of our understanding of the ear, because this

foam block is taking up so much space. So, the right otoblock really can help get the most information, as well as, you know, making sure that when we create that device, we're gonna have the best fit, retention, and sound quality as possible.

Now, this is a little bit less relevant than it was a few years ago when COVID was kind of the big thing, but indeed, if a patient is wearing a mask, this can affect the overall quality of the ear impression, especially if a patient does have, you know, soft ears, those masks can kind of pull the pinna forward, which would lead to distortion in the concha and the helix area. So indeed, if a patient is coming in wearing a mask during the impression procedure itself, we'd recommend that they at least remove the loops from behind their ear to avoid those distortions.

Now, step 3, this is where we're actually taking the impression. A couple different camps here, right? We can use that gun, we can use a syringe, there's no right or wrong. Oftentimes, this is just what we are comfortable using, or what our clinic has available. But these tips are really universal, kind of between them. First, when we are taking this impression, we want to insert the tip, we want to leave it in and let that silicone really start coming to flow around the end of the tip, whether that's the gun or the syringe. And second, we want to let that material flow now and fill that ear space naturally, and we really want to keep that tip movement to a minimum. And then third, we want to make sure that we fill up the entire helix. We also want to go up to the triangular fossa. And I think it's important to note here that regardless of what style earmold you're ordering, the more anatomy that you can capture, really the better earmold can be made. This also helps, you know, in the long term, in case that we do decide we need to switch styles, we can prevent having to take maybe another impression if we get all the anatomy right off the get-go.

Now, step 4, after the material has set, we wanted to remove the impression. Different materials have different cure times, so you can read about that on the instructions of your material itself. But, you know, after that cure time has gone, what we want to do is test to make sure that it is set, and we can do this by, you know, putting our fingernail into that impression in the patient's ear. Second, we want to break that seal before removing the impression. So, a couple tips there, you know, you can kind of gently wiggle the patient's ear. You can also ask them to make some chewing motions to break that seal. Next, what we want to do is we want to keep pulling on the ear while twisting that impression indeed towards the nose, so kind of like a corkscrew. And then next, what we'll do is we'll grab the string of the odoblock, as well as the impression, and kind of pull it out slowly. And then certainly, last but not least with this step, is to make sure that we do take a look in the ear after we do remove it. We want to make sure that there was no trauma. We also want to make sure, you know, that we have removed all the material from the ear itself.

And then step 5 is gonna be evaluate the impression. And you know what? If you get one that you think is maybe not the best, just do it again. And it always helps to set up that

expectation with the patient, even before you take the impression. You may let them know that, you know, we want to make sure that we get the best fit for the device, and we're going to do whatever we need to to make sure we have that, so we can send it into the manufacturer. Now, when considering a good impression, you know, we want it really as deep as possible. We want to avoid having any gaps or voids in the impression. Ultimately, we just want to give the most complete picture of that patient's ear when we create that impression. Now, if we take a look at some things that would make a poor impression. These could be voids in the impression. You know, sometimes voids would be due to unique anatomy, and that's okay. If there's growth in the ear, again, we can still take that impression, but it is something that needs to be noted. Short canals also can cause issues with retention and poor sound path. Maybe we missed that second bend, or we don't know where that sound would actually go. Additionally, you know, order block selection is really important here. We want to make sure that the otoblock is not going to change our perspective on how that impression is taken. And then last, we want to ensure that the impression material really kind of covers that otoblock, so we have the most accurate representation of the ear itself.

Now, let's take a look at some videos of these 3D scans of some incomplete impressions, as well as a good impression. So, just starting out with this video, what this is really highlighting in this video is that this impression does have multiple voids. And the voids that we see here are specific in that tragus area. The material really didn't fill it in, and this is a really critical area, because it helps with that seal of the earmold when we put it into the patient's ear. So, if it's underfilled, you know, the manufacturer would need to fill this in, which could really result in, you know, overfilling it and too tight a fit. So, important to avoid having these voids. Now, kind of taking a look at that same impression, but there's another issue with it, and that's indeed the canal. On this impression, what we see is the canal is a little short and it's underfilled at the tip, so we don't actually really understand what direction that canal is going, which can ultimately affect that overall sound quality. So, indeed important to avoid getting voids, but as well as making sure that we get a nice deep impression.

Now, let's take a look at a good impression. So, we'll take a look at this video here as they're showing off this impression, but this is a great impression. All that your anatomy is indeed captured. We have a nice long canal, there's no voids, so this would be a great example of what a manufacturer is looking for when an impression is indeed sent in.

So, now that we've completed the ear impression, the next step is actually going to be to choose what earmold we want to order. And when going through the thought process on what we want to order, really top of mind should be, what are we trying to solve? What is our goal with getting this custom product? You know, some of these may include a better fit, better retention, better comfort, you know, more consistent sound quality, or maybe a combination of these. But really have that in mind when we are thinking of ordering a custom product. And really, there's going to be four decisions in this step. You know, the first one is

going to be choosing the style, second is going to be choosing the material, third is the venting options, and then fourth is going to be personalization options. Now, most of these choices are going to be based off what is appropriate for that patient's particular audiogram and hearing loss. And then we can kind of continue to filter based on our thought process, you know, on things such as patient dexterity, your anatomy, or even cosmetic preferences.

So, now let's take a look at some different style options that we offer for earmolds. What we see here is really a snapshot of our RIC offerings, and this can range from our snap fit earmolds to our custom case earmolds. Now, the Rick Snap video molds really provide a distinct advantage in the sense that, you know, it allows you, as hearing healthcare professionals, to change out that receiver in your office as needed. However, our custom-cased options, this is, you know, can be beneficial because it allows us to disassemble the receiver configuration, reoriented the components and really fit the patient comfortably if they do have a challenging ear. So, a couple considerations on choosing a snap fit versus a custom case or embedded mold. Now, similar to our Rick-style earmolds, we do have a variety of different BTE style earmolds, and what we see here is this is actually going to be separated out by that traditional tubing versus the thin tubing. Now, once again, we can take advantage of whatever style is going to be best for a patient based on their hearing loss, their anatomy, and of course, dexterity and comfort. Now, I know the industry's kind of shifted away from thin tube earmolds, but it is still an option that we have available, and this can be a great solution for individuals who are really concerned about, you know, that cosmetic appearance. Whereas that standard tubing is a great solution, because it can really kind of fit all varieties and degrees of hearing loss. It allows, you know, that acoustic seal when we have those more severe levels of hearing loss.

So, a couple of considerations in terms of tubing when it comes to BTE devices, but... We do have a SnapFit Connect tube in. This is going to be great for your hard BTE or molds, maybe there's a narrow canal, SnapFit can be a nice solution. And then for those soft molds, we do have a 3D printed tube. So, kind of choose based on what type of material you're going to be using for that, your mold. So, let's take a closer look at the different styles, and maybe why you would choose one style versus another. Starting with the CIC, but this is really going to be for your patients who desire, you know, the smallest size and discreteness, but yet, they want the benefits of a custom earmold. And the CIC, you know, comes in both a thin tube option as well as a standard tube. This is gonna be most appropriate for your mild to moderate degrees of hearing loss. Now, as we go up in size, we don't necessarily want to sacrifice discreteness, and, you know, this canal style can be a great option as well. So with the canal style, we make two different versions. There's a solid version and an open version. The open one really can offer that really open vent, making it a great solution when people have retention issues, but ultimately, what those benefits of having an open earbud. And again, for the canal style, you know, mild to moderate hearing loss is kind of the levels that we are looking at here.

Now, remember how I was focused on capturing that true ear anatomy when taking an ear impression? We do have another style that's called a canal lock. Now, if your patient has a straight ear canal, maybe a short ear canal, or even a steep rise in their ear canal, ear mold retention may be an issue, especially since jaw movement and ear canal movement throughout the day may end up starting to kind of push that earmold out. So, by ordering a canal lock earmold right off the bat, might save you and your patient a headache down the road. It's really important here that we, you know, capture that concha bowl with the impression, so we can create really that best lock available based on your patient's anatomy. Now, one thing to note here is that, you know, this type of earmold can be great for patients who do have dexterity issues, because that lock can actually act as kind of a handle, and make it easier for the patient to insert and remove the device.

Now, as we continue to go up in size, earmolds can, you know, be better for addressing certain things like dexterity issues, but also providing a better seal. So the half-shell mold is a great choice for retention, ease of handling, but also, when it comes to helix discomfort. Sometimes we'll have a patient who may have a very sensitive helix area, and if they have had issues with that, the half-shell can really be a great solution to avoid going into that helix area, providing a really comfortable and overall functional fit.

Now, the full Shell earmold is probably the most traditional earmold that we've all seen, and the size and the areas of coverage of the style really provide an excellent choice for maximizing retention, overall seal, and offering a lot of material that can really help with insertion and removal. And this can really kind of cover all those different degrees of hearing loss, you know, even up to those severe and profound hearing losses. Also, to note here that this is really the choice style for pediatrics, due to its flexibility for fit, both for mild and profound hearing losses, but also that comfort and retention capabilities.

Now, the skeleton earmold boasts the same retention capabilities as that full shell mold, but we do take out some of that bulk. So as a result, it's going to be lighter, it's gonna be, you know, maybe a little bit better aesthetically, while providing that comfort and functionality that you would get with that full shell. So, a lot of times what I've seen, you know, clinically is that for people who have dexterity issues, this can be a great choice because it makes it easier to kind of grab onto that ring to insert and remove these devices. Now, sometimes we do see with this that some patients will have some difficulty tucking that in that helix portion. Maybe that patient comes in, it's kind of sitting out of the ear. So, indeed, you can always, you know, try re-counseling them, see if that does resolve that, but if we do have a skeleton mold, we can't get them to, you know, get that into that helix area properly, we can always, you know, specify that in our order form to reduce that helix area.

Now, this is a unique earmold that we do offer, but the Helix Earmold is really designed for those unique ears. So think about patients who have really narrow ear canals, maybe sharp bends, small conjugals. This can be a choice style for those really challenging fits. And the

smaller profile fits nicely into those narrow canals, the helix lock is going to provide great retention throughout the day.

And then, that kind of gives an overview of our standard earmolds, but I wanted to go over an earmold that is a little bit different. And this earmold is called our custom-cased Earmold option, and this is for those Rick-style devices. Historically, Starkey had called this our AP earmold, or our absolute power, but essentially both the custom case AP that's just going to be your embedded earmold. In this case, the receiver is actually physically embedded into the earmold, so it can provide more power. So this is going to be something that's required if a patient does need, say, that 70 dB gain receiver, but there's another benefit that we can use this for. And that is creating a custom solution when size is a big constraint. So, with this, you know, maybe the receiver itself can just not fit well into the patient's ear, but the unique thing with this custom cased option is we can actually disassemble those parts and really create an earmold to solve those most challenging fits. And this can be created kind of in any of those different receiver matrices, anywhere from 40 up to 70. So it's not just isolated 270 for power purposes, but it can also be purposeful to create a custom solution in those other size matrices.

Now, when fitting a patient with a RIC device, it's important to measure that receiver cable length. And with the SnapFit receivers, not as big a deal if we don't get that length right from the very get-go, because we can always change out those receivers from our stock. But if we are getting that custom-cased mold, it is important that we make sure we do get a correct measurement. We see here in the picture is our measurement tool. We want to place it over the ear like that and report the number that correlates with the top entrance of the ear canal. So in this specific case, I would choose a size 3 cable. Now, sometimes we'll see patients that are going to be maybe in between sizes, and for this, I recommend error rate on the side of the shorter cable.

So, once we've selected the style of earmold we think that's gonna best suit our patient, it's time to choose the material that we want to utilize for the earmold. So keep in mind that some styles are going to be precluded by the specific type of material, so it's important to be familiar with the pros and cons of each material, so we can really make an informed decision. But earmold materials really range from rigid to soft, with each having different advantages. But at a high level, there's really going to be two different types of material, hard and soft. Hard are going to be best for those mild to moderately severe hearing losses, while soft material can create a tighter seal, making it more ideal for those moderate to profound level of hearing losses. And indeed, if we do have a sharply sloping audiogram, and unsure what material to utilize, we recommend using the PTA and kind of using that as our guide for material selection.

Now, hard materials like acrylic are going to be kind of your most common material for your molds, because it's cosmetically appealing, can be easily modified in clinic, but it's also worth

noting that harder materials are easier to work with for patients who maybe have dexterity limitations. There's a higher degree of dexterity is required to manipulate those flexible earmolds. Now, the material is also going to be ideal for those soft ear canal textures, because soft material and soft skin can really pull and cause discomfort. So that's why we maybe would choose that harder material. Now, kind of when thinking about the acrylic material, a lot of benefits there, but keep in mind that it might be uncomfortable for patients who do indeed have sharp bends or a stepped-up ear canal.

So we do offer a soft material as well, and our soft earmold material is really a high strength silicone, available in both 40 and 60 shore. And the thing to keep in mind here is that the higher the shore value, the more rigid the material. So, the 40 is going to be the softest, but it is really resistant to tearing, so it can be a great choice. Now, the silicone molds are going to be great for people who have maybe a harder ear canal texture. This can provide more comfort for those sharp bends or stepped-up canals, and indeed, also, we see that the silicone is often used for the pediatrics because it's going to be soft against their skin. Now, silicone material can really be an ideal solution if your patient is sensitive, allergic to the digital SLS or that acrylic material. And you can often tell if a person is having a reaction to a different material based on maybe some discomfort, swelling, or if you notice some dry or itchiness of the ear. Now, we have different recommendations, kind of here on rank order, on what to do if we do notice that indeed there is any of these reactions. You know, oftentimes, it's first just switched to the opposite material. For an acrylic, we see a reaction, we can switch over to that silicone. But we also have, you know, other options, kind of as we need them. So, lacquer finishes, allergy codes can be added to those high-strength silicone and digital SL molds, respectively. And kind of in those worst cases, gold and silver plating can also be added. So, adding coatings to your molds can help with issues beyond just allergies. So, ultimately, if we choose digital SLS, but we have any retention issues, we can request a soft coat to help with their retention. And additionally, if we're concerned with moisture, we can actually add a protective coating to any material called Hydroshield.

Now, switching gears a little bit to a different topic. But this is oftentimes where we see some professionals are hesitant, and that's in terms of selecting the proper venting. So, venting not only helps keep the air out of the ear canal, but it also plays a significant role in sound quality. So how much venting is indeed needed? Well, venting typically affects frequencies below 1,000 Hz. So, when recommended, uh, considering the hearing thresholds at 500 and 750 when choosing the vent size. And we know that oftentimes we're not measuring 750 unless there's a sharp slope, but if you do have time, you know, it can be a good data point in terms of choosing our venting. But ultimately, the better the thresholds at those lower frequencies, the larger the vent. So we can avoid having that occlusion effect. The poorer the threshold, the smaller that we'd want to choose to make sure that we can indeed provide adequate amplification. Now, a little tip and trick here, if you do simulate your patient's hearing loss in our ProFit fitting software, it will actually recommend a vent size based on their audiogram.

Which would be indicated by a blue star if we were to choose earmold as the acoustic option.

So, up to this point, we've talked a lot about customization and how to make your patients' needs both acoustically and physically, but kind of taking it further. We can look at some personalization options. So, sometimes maybe patients want to add glitter for fun. This is really going to work best with your transparent color of your molds. You can also have a swirl effect and have up to three different colors with that. And then, you know, if you are choosing a swirl, try to avoid mixing light colors with clear, if they're really trying to look for that visual effect. So, those are some fun things you can do with earmolds in terms of personalization, but sometimes you're actually going to personalize it based on, you know, patients' actual needs. Maybe it's physical limitations, memory issues. So, for patients who need help with removing their earmolds, we can add different styles of handles that can really help with that insertion and removal of the earmolds. Additionally, there's other options that you may want to consider, especially in terms of if a patient has any, maybe, cognitive issues or difficulty with identification. And these can include, actually, color coding, you can put dots in so they can, you know, differentiate the right and left earmold. You could actually have two different color year molds altogether. Maybe a patient, you know, is kind of notorious for losing things, we could actually engrave their initials or a name into the earmolds, but another way to kind of help combat that is, you know, some other ways that we can connect these devices, so maybe it is going to be a cloth or vinyl cord to connect it, or metal loops to make sure that the patient does not lose their hearing aids.

So, kind of switching gears here a little bit, but let's go over some modification techniques. So ultimately, we always want to, you know, create that best ear impression as possible, but there's going to be times one modification of earmold within the clinic can be really beneficial. When thinking about modifying earmolds, this is really kind of an advanced level of service that your patients would really appreciate. And some things to consider here is it not only saves time for your patient, but it allows you to create a temporary solution, maybe if you're ordering another earmold, and then refit them with that as it comes in. So ultimately, it's really this convenience factor by being able to offer in-office modifications, that's really huge value.

Now, just wanted to show some tips and tricks in terms of modifying earmolds, and we'll go over some kind of videos on different common modifications, but... First, you know, we want to identify where the patient is having discomfort, especially if they're a new user, haven't put it in, make sure it's inserted properly. And then if you find where that area needs to be modified, this is going to give you a good understanding of what modifications may need to take place. Second, before it touches your modification equipment, you do want to clean, sanitize your mold to avoid any cross-contamination. Third, make sure you're using the correct tool for the job. So, typically, with those acrylic or the digital SLS molds, you're going to use the white stone or the trimmer bit, and those for the silicone molds, you're gonna use

that bluestone for modification purposes. Next thing, you know, make sure that when you are doing modifications, you're holding on tight to these devices, use both hands. And then, you know, when doing modifications, start slow. Take off less. You can always, you know, take off more with time, but if you take off too much right away, that can really, you know, cause some issues where you'd actually have to order a new earmold altogether. Now, it's important to buff out the earmold, too, after you're done with that modification, especially in terms of the acrylic material. We want to make sure we avoid any sharp edges, but if we're using that silicone material, you know, you're not buffing it as much, but we want to make sure that, you know, it is a good, comfortable fit for the patient. For the patient puts it back in the ear, again, clean and sanitize the earmold. And then, ultimately, check to make sure that it is, you know, fit in. We've addressed the issue, it's comfortable for the patient. And then, you know, we can always continue to modify more as needed.

But let's take a look at a couple, kind of, typical modifications that we might do. So, tight fits. This is where you would maybe want to grind down some material, or if there's specific pain points. So in this video, we're going to see our technician at Starkey, his name is Alfredo, makes some of these modifications. So, common area discomfort can be the helix, so for this, you know, we want to take a look in the ear, see if there's any redness or tenderness to touch. We'll take a look at how this modification is made. Kind of identified the area where we need to make that modification. You'll notice, as I mentioned before, continue to hold that earmold with both hands throughout the entire modification process. And another thing to note in this video is, indeed, this is a silicone earmold. So, not gonna buff it at the end, but he's really gonna smooth out those edges with that blue stone on that grinder as well.

Okay, going ahead to the next modification that we'll make, but for a bulbous canal, how can we modify based on that tight fit? So we're going to see here, we got the area identified, and we're just going to shave off some material to loosen that fit a bit. Now, especially for tight fits, be careful when you're making modifications that you're not taking off too much material at one time. You don't want to go from a tight fit to a loose fit. When we're doing these modifications, this can really happen in a matter of a few seconds. So, just something to be aware of.

Now, let's talk a little bit about occlusion. Sometimes when fitting patients, especially maybe those patients who are new users, maybe they have really good low-frequency hearing, occlusion is something that often comes up. Now, there's some modifications that can be made in software to address seclusion, but another way to address this would be, indeed, enlarging the vent on the earmold. So, let's take a look at how Alfredo would enlarge a vent in terms of modifying an earmold. So for this, he's actually going to be using a handheld instrument, not that big writing machine. This is going to give him more control as he's working, and this is called an extended burr tool that he's using in that vent. And what we're going to see here is he's gonna start on one side of the vent, but he's actually going to

enlarge it, indeed, from both sides. So, flips it over and goes into the event from the other side as well. Now, once he's created that larger event, he's gonna do here is he's gonna use an air gun to blow out any of that excess material. This might be not a tool that we commonly have in clinic, but we could use that compressed air, or even a, um, one of those tubing blowers that we have for our hearing aids to clean it out. Now, another thing we're going to see here, and this is kind of an extra step, this might be not something that you would typically do in modifications, depending on your comfort, but he does add a liquid resin to really restore shine to that vent. He's gonna cure that under a UV light.

So, if you've never done your mold modifications before, maybe you're not comfortable with that craft, don't worry, you can always, you know, order a remake. I think when it comes to ordering a remake, you know, make sure that you do get a new impression, especially if there is fit concerns, and then send in both the new and the old impressions, so we can really compare them. And then mark the area where there may be a discomfort or, you know, things that you had noticed when interacting with your patient. And I think it is important to always consider, you know, getting a new ear impression, because if we do try to make a new earmold without having that new impression, a lot of times we'll see that the patients are going to continue to experience the same issue. And then also note, just any special requests or concerns, make sure you note those in the order form, or even call in to discuss those when considering the year mold for your patient.

Now, kind of going beyond our earmolds that we offer just for hearing aids, but let's take a look at some other custom products that we can offer. And again, this can really help differentiate you as an expert in your, you know, as a hearing healthcare professional. So, some different styles, and note that anything ordered from Starkey for hearing aid earmolds is going to be under Starkey brand. Any of these other options for your molds that are not related to hearing aids, these are going to be under our Soundgear brand. But we have different solutions to a solid earplug, a sleep earplug, high-frequency noise filter earplug. Now, this one's really unique because it actually contains a chamber that's going to attenuate certain sounds. So this can be a great option for, you know, people who indeed do need to hear speech, but kind of want to block out some other noise, so maybe flight attendants or motorcyclists. And then we do have a mini filter earplug, and this is really designed to provide equal attenuation across all frequency is different filters available for those, so 10, 17, and 26 dB. As well as an impulse filter for high-intensity sound, so... Great choice for people like musicians or hunters with that style of earplug.

We also have some other specialty solutions, so a swim plug that looks like a solid ear plug, but it's actually made with a floatable material, so it's not going to get lost in water. We have a news reporter, or a newscaster type of solution, and this can be great, you know, to provide that one-way communication. We also sometimes see security personnel or law enforcement use this style of earmold. And then, indeed, you know, racing receivers, this can be great for

those race car drivers, so they're able to get one-way communication from their crew. We do offer a pilot headset, so this is nice because it's actually going to offer a two-way communication system for the pilot 2 here, and to speak to others. Anesthesiologists, this is a kind of a unique earmold, but these medical professionals, right, they're really critically monitoring different signs during surgery, so having something that's comfortable for them to wear, and they can connect easily to their equipment. And then also, we do offer a telephone headset, so this can be a great solution for customer service professionals who are going to be on the phone all day.

Now, a couple other unique offerings that we have, but basically a custom fit for AirPods. I know those AirPods don't fit everybody, but we do offer a custom solution for that. And then, certainly, last but not least, for us hearing healthcare professionals, we do have a custom listening scope. So, let's kind of wrap it up by taking a look at some case studies and apply what we've learned throughout today's discussion.

Starting out with Wendy, she's a professional, and she's noticed some difficulty hearing and understanding her coworkers in meetings, as well as understanding speech in noisy areas. We look at our audiogram, what we see is it's normal, sloping to a severe high-frequency hearing loss in both ears. And when she comes into the clinic, she's really, you know, interested in giving hearing aids a try and seeing if they can address those concerns. So, when it comes to choosing the product, let's start out with lifestyle assessment. You know, we know that business and social settings are going to be kind of the issues she's having hearing. She wants a device that's going to be long-lasting, durable. She's got some cosmetic concerns, but really what she wants solved is that audibility is her main concern. So kind of the second step to this is, you know, consideration of the ear anatomy itself. When we did otoscopy, we noticed her ear canals are pretty narrow, there's some sharp bends, but other than that, there's really nothing remarkable. You know, normal ear canal texture, she's got normal dexterity. So, ultimately, she was fit with the Starkey Edge AI Rick RT hearing aids with a 7mm earbud. And then we did schedule her for a follow-up visit. So two weeks later at her follow-up visit, she does note that she's, you know, hearing a lot better in noisy situations, so she's happy with that, but one of her concerns is that the earbuds are not staying in place, and she often has to push them back in throughout the day, which can cause some frustration, and maybe even, you know, some inconsistent sees in terms of the sound quality. So, what are our options? Well, we chose that 7mm bud. We could either go larger or smaller, you know, to see what is going to help with the retention, but, you know, one thing to consider here is if we recall our physical assessment, she had some sharp bends, and those are likely what's causing those earbuds from staying in place. So really creating a custom solution might be the best way to address Wendy's concerns. So, in terms of choosing the earmold style, what might be best? Well, ultimately, we chose an open helix earmold, and this is really designed for cases like this, this open-fit earmold is going to maintain that sound quality, but a comfortable fit that earbuds provide. But ultimately, that helix lock is going to provide

increased retention. So, the Helix mold, again, is going to be available in all those different materials. Now, which one should we choose for Wendy? I think given her age and dexterity, we could really go any direction here. But ultimately, what we chose was to go with that 40, high strength silicone, it's really gonna be the softest of the three options that we offer. And this was indeed due to those sharp bends in her ear canals. We want to be mindful of that discomfort that she might get with a more rigid material.

So, fit with her earmolds, comes back, two weeks again later for a follow-up, and she reports that she's really happy. The open fit is great, no changes in sound quality, the soft material's comfortable. Earmolds are discrete, and that fit is really secure. So, nice way to kind of create a custom solution and address the patient's concerns in this case.

Now, our next patient, Marty, he's a retired carpenter, experienced hearing aid user. He comes in reporting that he's lost a lot of weight over the past year, and has noticed that his earmolds don't fit so well anymore. So, interested in getting new ones. So, at this time, we're kind of doing our lifestyle assessment, we just know that he needs new earmolds because of that, um, not fitting as well anymore. So as we prepare to take those ear impressions, you know, we do our otoscopy, take a look at the ears. We notice his ear canals have a soft texture, his ear canals are really straight. But he also states he's having some difficulty, you know, with his hands, and maybe some, you know, changes in dexterity. So he's been having some issues trying to insert the device's. So, what should we choose for this? Well, we know he's got those really straight ear canals, we want something with better retention, so what we chose to go with was a skeleton earmold. This is going to provide greater retention capabilities, also should be easier in terms of insertion and removal with those dexterity concerns that he's expressed. Now, considering what materials should we order. We did note that he has a soft ear canal, so, you know, as we were stating with that. You know, sometimes choosing that acrylic option, or that harder option can be better for those soft ear canals. So we ultimately ordered that digital SLS acrylic material. And then, one thing to note is he is an experienced hearing aid user. He wasn't having any sound quality concerns. So we ultimately chose the same vent size he had with his old, um, canal locator molds, and that indeed was a small vent.

So, comes back again for his follow-up, you know, reports that this really addressed his concerns, he's really happy with those new earmolds, no problems with retention, and it's a lot easier for him to handle that skeleton mold. Now, this is kind of a unique case, but, um, you know, we did provide a great service to him by creating that custom solution. We noted that he was, you know, somebody who works in his wood shop, so he does want to take a look at maybe some custom hearing protection options. So this is just a way that we can kind of continue to expand our services as hearing healthcare professionals when we set ourselves part as an expert. So we did kind of discuss some different solutions with him and got him some solid earplugs for when he is indeed working in his workshop.

Now, our last case study here, this is Dr. Bird and his patient, Ruth. He decided to order Ruth a 50 gain Rick Hollow ear canal earmold, and he took the impressions. He notes that his, um, her ear canals do have sharp bends. But he was able to capture complete ear impressions, so he sent in that order. Now, he did receive a call back from Starkey a few days later, to discuss that order. And when we scan those ear impressions, we see that, granted four different views here, but the issue is really that sharp bend in those ear canals, and the size constraints with this. And this is often one of the biggest challenges we face with these tiny ear canals, or ear canals with a sharp bend and just the limitation to the receiver hardware itself. But this is kind of a neat way to visualize this, and this is what it actually looks like when we put it into our, um, modeling software. So we're going to kind of take a look at the fit of this device in the modeling software, and we'll see that the receiver here is really the concern, and it's actually unable to go around that sharp curve, and it just does not fit.

So, when we spoke to Dr. Bird about those different options, you know, we considered a helix earmold, but he really wanted to stick with that canal style. So what we did is we recommended a order that custom case solution with a 50 dB gain receiver. And, you know, as we can recall from earlier in our discussion, but it allows us to really get creative with that receiver placement, because it can actually be disassembled when it's in an embedded earmold. So this ended up being a great solution for Ruth, because we were able to create something that fit, indeed, into her ears without having to consider, you know, that the receiver itself was just too big to go around those bends.

So, I think this last case is a really great example. Um, you know, keeping your patients' needs in mind when, you know, considering different solutions for your molds. So, indeed, you know, a couple takeaways here, but have patience, be creative. There's not one right answer. There's a lot of art to this. So, if you do have concerns, you know, always feel free to contact us. We can really work with you to create a custom solution based on any patient's individual needs. But ultimately, you know, by creating custom products, we do offer a lot more services to our patients, and really can address their individual concerns. So this can really help differentiate you again.

Now, we covered a lot today, and we do have a lot of other resources available, so... If you go to StarkeyPro.com, we have an ear mold guide, we have a modification guide. But indeed, if you do want, you know, some more one-on-one training, always feel free to reach out to your Starkey representative. And they can direct you accordingly. So that being said, I wanted to thank everybody for attending. And I hope you have a great rest of your day. Thanks so much.