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Medical Error Prevention in Hearing Healthcare: Ensuring a Safe Patient Experience

Presenter: Janette Mongelli

Good morning everyone. Thank you so much for joining me today. Today we are going to. Excuse me, I'm so sorry, it's dusty. Here in Arizona today we are just going to be reviewing medical error prevention in hearing health care because we always want to ensure a safe patient experience.

My name is Janette Mongelli and I am a member of Starkey's Regional Education and tr. Thank you again for coming with us today on this fun journey. We know that you could be elsewhere and you've chosen to be here, so we appreciate that. Now, before we get started, I do want to answer some frequently asked questions for the webinar today. So if you have any questions, I'll have you use that Q and A feature.

We are monitoring that Q and A section and I will plan to answer any questions that you might have at the end of the presentation. Presentation all right, so today's course is valid for one CEU that is of course, with your paid Audiology Online membership. After you complete the course today, you'll want to go to your pending courses section of Audiology Online and pass that five question exam to earn your ceu. Now, if you have any technical issues during the presentation, please feel free to either call or email AO directly or you can use that Q and A window to report any issues. Anna has also posted the handout as a PDF, so if you'd like to download that, if you need a copy of this, it's there for you.

Well, without further ado, let us get started.

Now, today's learner outcomes are first, to define the four components of SOAP notes, second, to identify primary red flags requiring medical referral, and third, to identify tinnitus symptoms requiring emergency medical referral. Now, this training is an overview of many ways that we can prevent medical errors from occurring. You know, likely because of the nature of this training, are likely already well versed in anatomy and disorders of the ears. So this is a bit of a refresher. However, if you do want more in depth training on any of these topics, we would just say follow up with your practice manager.

There are a variety of courses available on Audiology online. As you likely know, one of my favorite CEU providers, I use it for my CEUs. All right, so today's agenda, we are going to discuss clinical documentation right now and a variety of things. So patients do put a lot of trust in us as their hearing healthcare professionals. We really do owe it to them to be competent not just in evaluating their hearing loss and potentially fitting hearing aids, but with the varied medical conditions that we might encounter daily that are related to their hearing health.

So today's course will review root causes of medical errors, the most common errors in audiology practices, and steps to minimize any adverse outcomes. As a result, we're going to review clinical documentation, types of hearing loss, the importance of otoscopy, when medical referrals are necessary, Medical red flags. This is a big one. Tinnitus, ear mold, impression safety, tympanometry. And then we'll just wrap up with the importance of follow up.

Now, I know that writing notes is no one's favorite part of our work. It is an essential part of what we do daily. Of course, I worked in private practice before I joined Starkey, and the owner of my practice, who is also an audiologist, would often say, if you don't document it, it never happened. So this is an important part of ongoing patient care, but also it serves as a way to, you know, confirm what you're actually doing during that appointment, you know, any steps that you might have taken, interventions, et cetera. So it's all very important, particularly as it is part of that patient's medical record.

It's important that we have that completed. Now, I want to review SOAP notes today. Now, I know many of us are very familiar with SOAP notes, but I always think it's a great refresher. They're a very effective form of clinical documentation. The SOAP note system really provides you with a clear framework to structure all of your clinical notes.

And this is important, of course, make sure that you sign and date your notes. Now, if you are using an electronic medical record system like council EAR or cycle, what have you, likely those things are going

to be signed and dated automatically, but again, it's just something to keep in mind.

Now, the SOAP note structure is right there in the name. I don't know about you, but I need mnemonic devices and acronyms to remember everything. Sometimes, though, I then have to sort of remember what the acronym actually stands for. But thankfully, that SOAP format is relatively easy to remember. So first is subjective.

Right? Now, this is just the description of the problem as related to you by your patient or essentially their reason for coming in that day. You know, with this subjective piece of things, you can certainly quote what a patient has said. You know, you can just share exactly what they've said to you. Right.

Next is O, which is objective. Now, these are going to be observations that you make that are related to the problem or to the reason for the visit. So this could be something like stating what testing you completed or, you know, Your observations about a pair of hearing aids that your patient brought in. Next, we have a, which stands for assessment. Now assessment consists of analysis or interpretation of your results.

So this could refer to interpretation of the testing that you completed. It could also refer to whatever steps you took to solve the problem that the patient had when they came in. So this could be steps that you took to deal with that complaint of their, that they brought in with their hearing aids. Right. And then finally, this is very important, we have plan.

Now you can think of this P for plan as just a plan of follow up care, how you're going to provide ongoing care if needed, or maybe even that you're just going to schedule a test in a year from now. So I just want to share an example here. So this is an example of a completed soap note. So our subjective is that Mr. Jones comes in, he reports that his hearing aids aren't working.

That is a very common thing that I would say most of us encounter. We have folks who come in and they just say my hearing aids are broken, they're not working right now. That could mean a variety of things, but ultimately to that patient, they're just not working. So next comes the objective. These are your observations.

So the receivers were plugged with wax. I bet you never would have guessed that one. The hearing aids are actually functioning. After we removed the wax, we did video otoscopy. This showed significant ear canal occlusion from the cerumen bilaterally.

Okay, now analysis is just your interpretation. Excessive cerumen caused that hearing aid to malfunction. And then finally we have our plan in place. So again, just establishing a plan of care for the patient to be seen for that cerumen management. Right.

It might also include things like we reinstructed the patient on changing wax filters, maybe gave them some strategies. So go ahead and just change those filters whenever you change your batteries. And then also we've scheduled three month appointment to clean and check and monitor. We also instructed that patient to call or come in immediately should issues arise. So I know for me that I tended to get into sort of a long narrative structure when I was completing chart notes.

And while that's not bad, it can be time consuming and sometimes, at least for myself, I would lose sight of those very specific pieces of this SOAP note structure. So it's not that that information shouldn't have gone into the chart note. I think any significant interaction that you have with a patient should be recorded. But for myself, having this type of a structure was really helpful. I did have to Remind myself to use that.

But again, it's just as helpful and it makes it really easy for other folks to come in and read your not notes, because certainly you're not going to be the only person reading those, right? It could be another

audiologist or hearing aid dispenser in your practice. It could be front office staff, could be a variety of folks who might be looking at those notes. Now, in that same vein, I just wanted to address, you know, this professional communication and collaboration as hearing healthcare professionals. We interact with many other healthcare professionals, right?

This could be primary care doctors, ear, nose and throat doctors. If you work with vestibular patients, you might be interacting with physical therapists. You might have to be interacting with, you know, insurance and all, right? That's just to name a few. So it's very important for us to communicate in a professional manner, and it's also important that we do it efficiently.

Now, written reports should be clear. They should be to the point. And we want to try to avoid lots of jargon, right? These very specific terms that we in hearing healthcare would know, but that a physical therapist or a primary care doctor might not be familiar with. Now, importantly, we also need to make sure that we're respecting patient confidentiality.

So in the United States, that includes being in compliance with hipaa. So, you know, if you are planning to send notes to, you know, another professional who was not the referral source, typically you'd have to have that patient fill out that route. Release of information, right? We just want to make sure that we're in compliance with HIPAA at all times.

But we are going to shift gears a little and we're going to review the different types of hearing loss. Now, there are certainly several types. We've got conductive, sensorineural, mixed, and then we also have central and functional. So we're going to go into these a little bit.

Now, a conductive hearing loss is just the result of abnormalities in the external and or middle ear, okay? Meaning that the passage or conduction of sound through that outer or middle ear is somehow impeded. Now, because conductive hearing loss is the result of an abnormal structure, it could

potentially be treated by a medical professional. Now, that doesn't mean that every patient with a conductive hearing loss will want to be treated medically. But it's really important for us to explain what these things mean so that patients are informed and are able to make appropriate decisions.

Now, this audiogram is a classic example of a conductive hearing loss, right? As evidenced by these increased air conduction thresholds. In the presence of bone conduction thresholds that are in the normal range. Now, there are a lot of pathologies that can result in a conductive hearing loss, including, you know, an ear infection with fluid in that middle ear, an ossicular discontinuity, otosclerosis, atresia, just to name a few. Now some of those disorders have sort of a hallmark configuration of that audiogram, which we will, we won't go into, but again, just something to sort of keep in the back of your mind.

Now, in other words, when air bone gaps are present and bone conduction thresholds are normal, the loss is conductive in nature. Now I will say for me clinically, this was something that patients had sort of a hard time grasping because they aren't well versed in the anatomy. Right. Of our peripheral and central auditory system structures. So oftentimes I used a diagram to show folks, this is the middle ear.

Now we have an issue somewhere in here, you know, and then we compare to bone conduction. Right. But this does seem to be something that patients need a little more explanation on. Now next, of course, we have a sensorineural hearing loss. Now this is likely going to be the majority of patients that you see.

It is certainly the most common. Now, sensorineural hearing loss is characterized by irregularities or damage in the inner ear or cochlea and potentially the auditory nerve. Typically, I would say that damage is in the cochlea. Now with this type of hearing loss, there are no concerns with the outer or middle ear and the loss is isolated to the sensory and or nerve structures of the auditory system. Now some folks refer to this as nerve loss.

So if you ever have patients come in and they say, oh my brother in law has a nerve loss, that is likely what they are referring to.

So in this example, air and bone thresholds are in good agreement. There are no significant air bone gaps and all of the thresholds are outside the range of normal hearing. The most common way that, you know, patients would describe this to me was saying, well, I can hear people talking, but I can't understand them. And if they didn't say it to me, I would say it to them and they would nod in recognition. Right.

And this type of issue tends to be a particular problem in background noise. It is often quite difficult to pinpoint the causes of sensorineural hearing loss, but there are certainly some known factors. Heredity can absolutely play a part. Presbycusis, which is just hearing loss that's associated with aging, noise induced hearing loss, those are also very common. Some things that are not as common.

Those could be an acoustic neuroma or Meniere's disease. Now, in other words, when air and bone thresholds are approximately symmetric and some or all of these thresholds are outside that normal range, the hearing loss is sensorineural.

Now, a mixed hearing loss, I will say, is also along with that conductive hearing loss is also something that often takes a little time for patients to wrap their brain around. Now, a mixed hearing loss is just that. It is a combination of conductive and sensorineural hearing loss in the same ear. So this is a configuration that you might see with a hearing, a mixed hearing loss. So in this audiogram, you can see that there are substantial ear bone gaps present in that right ear and there are some normal bone conduction thresholds, right at 500 and 1000 Hertz, those are in that normal range.

But some of those bone thresholds are outside the normal range. So in other words, right when air bone gaps are present and the bone conduction thresholds are outside that normal hearing range, the loss is mixed. Okay? Now this could arise from something like a noise induced hearing loss or presbycusis, along with an ear infection, right where they may have fluid in the middle ear, and that can, that creates a conductive component. It could also be a combination of sensorineural hearing loss like presbycusis and otosclerosis.

So there are a number of pathologies that can relate or result in this mixed hearing loss. Now, I do want to touch on central hearing loss. Now, this is characterized by difficulties hearing or understanding auditory input in the presence of normal hearing. Okay. So it's difficulty for the brain to process or recognize or understand sounds or speech accurately, again in the presence of that normal hearing.

Now, very simply put, assessment of a central hearing loss is best made by demonstrating inconsistency between pure tone testing, so an audiogram and speech testing. Now, if someone has normal hearing, you'd expect them to perform well on word recognition or speech and noise testing. So if you see someone like this, a good starting place for this could be completing an audiogram and then doing some speech and noise testing like the quicksin. Now that is certainly an oversimplification. That's just a jumping off point.

There are much more in depth testing protocols for central hearing loss. Now, some of them may be related to neurology, and some of them, you know, might be done by an audiologist who is, you know, who works with central auditory processing disorder. So there are certainly very in depth testing to be done here. So some examples of this are auditory agnosia, which is also sometimes called pure word deafness. So it is an inability to comprehend speech.

So people with this disorder lose the ability to understand language, repeat words, and even write from dictation. There's also cortical deafness. Now, this is an auditory disorder where the patient is unable to

hear sounds, but they don't have any apparent damage to the anatomy of the ear. So this is, or can be thought of as a combination of auditory agnosia and auditory verbal agnosia. There are also auditory hallucinations, right?

And those are false perceptions of sound. So those have been described as the experience of internal words or noises or even music that have no real origin in that outside world and are perceived to be separate from that person's mental processes. And then last, we have central auditory processing disorder. I will say that this is a particular point of interest for me. I really love learning about that central auditory processing.

And I, you know, when I was practicing clinically, I was working with evaluation of this. So this could be maturational, Right? We often see central auditory processing disorder in children, and many of them grow out of it. It could also be acquired. So there could be an auditory processing disorder related to a traumatic brain injury or, you know, related to a stroke.

Okay, so last on this list is functional hearing loss. Now, this is just a decrease in hearing that can't be explained by anatomic or physiologic abnormalities. So another term for this is pseudohypacusis. This occurs Right, When a person isn't. Or maybe they can't be truthful or reliable in terms of their responses during an audiologic evaluation.

So this could be, you know, someone who is malingering intentionally, but not always. I mean, some folks truly have some other things kind of going on, and they just aren't reliable reporters in terms of these testing results. So in these cases with this functional hearing loss, there's no organic cause of it. So there's nothing wrong with that person's peripheral or central auditory nervous system. Okay, I want to move on just to the importance of otoscopy.

I cannot overstate the importance of thorough otoscopy. So this is really going to set the stage for the rest of your interaction with your patient. Now, that might sound dramatic, but just stay with me. So, you know, as we go through case history with our patients, many of us start putting together the pieces of the puzzle, right? So when someone says, oh, I can hear, but I can't understand, that makes me think that they likely have good low Frequency hearing.

Right. With a loss in the high frequencies. When they say that they hate earbuds like earphones because they don't stay in their ears, that makes me think I'm going to expect to either see very small ear canals or canals with sharp bends in them, or perhaps both. In my case, it is both. So, you know, we need to be very careful and, you know, cognizant of what we are doing.

When we are completing otoscopy, you want to make sure that you can visualize that eardrum as much as possible. Now, I certainly had some patients who had a lot of hair in their ears, which is also why I had a nose and ear hair trimmer. Sometimes there's so much hair in that ear canal that it's really challenging to see the eardrum. So with consent, of course, I did shave some ear canals with that trimmer. And I did used to joke with my patients that, oh, you didn't know you were going to a barber shop today, did you?

So there may be obstructions, but that is why otoscopy is so important. Right. Because we know that's going to affect testing. It could affect, you know, outcomes of other procedures that we might want to do. So when we are doing otoscopy, we really want to see that cone of light.

Now, this is just a visible light reflex, right? So what happens is we shine that light on the tympanic membrane and it causes just this sort of cone shaped reflection in the anterior inferior quadrant of the eardrum. So this eardrum here is a right ear. So again, if you're thinking anterior inferior, you'll see, you can orient yourself from there and tell which ear this is. So I do want to now move on to talking about issues that may require medical referral.

Now, there are a number of conditions that you might discover during case history, otoscopy and audiometric evaluation that would require medical referral. I'm going to call these your red flags because these issues are outside our scope of practice as hearing aid dispensers and audiologists. Okay. So if you find one or more of these, we really need to consider medical referral. So I want to just specify medical referrals should be made if these conditions are not known to the patient.

Okay. Or if they have not had any recent medical attention from a physician, or if you have any concerns about moving forward with treatment and you want to get medical clearance. So if your patient comes in, they have a long standing history of otosclerosis and they know it and they have A mixed hearing loss, you likely would not need to refer for medical. Medical intervention. Of course, you still want to share your testing with the other professionals involved, but just keep that in mind.

So our primary eight red flags are this visible congenital traumatic deformity of the ear. Active drainage, sudden hearing loss, acute or chronic dizziness, unilateral hearing loss in that last 90 days, any air bone gaps greater than 15dB at 500Hz, 1000, 2000Hz, any reported pain or discomfort, and then excessive cerumen or wax or any kind of foreign body in the ear canal. So anytime that we see a deformity of the ear, we need to identify what we're seeing, ask that patient clarifying questions, and then refer to a physician if we do have any concerns. So again, medical referral should be made if. If that is a new condition that you're identifying.

Okay. So there are some congenital deformities that folks likely know about. And by folks, I mean the patient. So if we have atresia or microtia, those things are both going to be known. Okay.

However, there are some acquired deformities as well. So we have exostosis. Right. These are often referred to as swimmer's ear or surfer's ear. So they just are bony growths of that ear canal close to the tympanic membrane.

And it results from really, like, long exposure to cold water. So I have to say, I did love looking at a patient's ears, taking a gander, seeing exostosis, and say, did you used to do a lot of swimming, you know, in cold water? And they would think I was a magician. How did you know that? I used to be a surfer.

How did you know that? I used to go swimming in this lake all the time. So there's also an osteoma. So this is just a benign tumor. And it sort of looks like cortical bone, and it's coming at this tympanomastoid structure line.

Okay. It tends to have a pretty narrow base, so you can see, though it's very close to the tm. So this can result in narrowing or closure of the canal near the tympanic membrane and can certainly impact folks hearing. Okay. Now, they're also acquired deformities.

So there are traumatic deformities. Right. You're more likely to see these with the veteran population, anyone who's been exposed to traumatic events that could have impacted the structure of their ear. There's also cauliflower ear. So this is just a deformity of the ear.

It's also called perichondrial hematoma. But I would say most lay people know it as cauliflower ear. And it is just a deformity caused by trauma. So this happens when there's like a impact to the ear, to the head, and blood ends up pooling in the pinna after it's been struck. So this hematoma, if you do not want it to result in a permanent change in your ear structure, it should be treated right away.

Now, there are also, you know, disease induced deformities. So this could be melanoma. Right. I live in Southern Arizona, like I said, and we get a whole lot of sun. So, you know, I had a patient who had sort of like a dry, crusty spot on her tragus.

And she hadn't really paid much attention to it. She sort of just thought it was dry skin. It didn't look right to me. So I referred that she followed up with her pcp, which she did. And I didn't see her for you for a few months.

When she came back, though, she thanked me for letting her know about this. It turned out that the spot was melanoma. She had to have surgery to remove it and then reconstructive plastic surgery on her tragus. So you see something, say something. You also might come across a cholesteatoma.

If you do very immediate referral for that is crucial.

That next red flag is any active drainage in the past 90 days. So this could be super otitis media. So especially if you see, you know, a bulging eardrum, if any fluid is visible, if there's a retraction of the eardrum, these are all important things that you would want to refer for. Okay, next here is just a sudden hearing loss within the last 90 days. So there can be a variety of causes of this.

Sudden hearing loss could be, you know, infection, disease, trauma. So we're going to go a little bit more in depth there. So in terms of trauma, that could be a head injury, right. That results in a temporal bone fracture, a concussion. If there are any injuries to the middle ear or to that inner ear, if there's barotrauma, so that is a drastic air pressure changes.

So that is often common with scuba diving accidents, right, where folks don't ascend or descend into the water at an appropriate speed and that affects the eardrum, it can cause a perforation of the tympanic membranes. Now, as I said, ototoxicity is one that can cause sudden hearing loss. So aminoglycosides are a Large class of drugs. They are a strong antibiotic that are used in treating infections that are caused by gram negative aerobic bacteria. So all of these glycosides, right, are ototoxic and to some extent they're also vestibulotoxic.

So it is something to keep in mind anytime you have a patient who said that they are taking a MMR antibiotic or that they have taken it. It's something that you want to be on the lookout for. Now, there are also tumors, right, of this middle and inner ear. There are glomus tumors. That's a rare benign soft tissue neoplasm.

It usually presents in the second to fourth decade. So, you know, 20 to 40, 45ish, and it accounts for between 1 to 5% of all soft tissue tumors. Okay. It's just a component of the dermis layer of the skin. But it's important to have that, you know, treated.

There's also osteomas, as I mentioned, you can have a squamous cell carcinoma of the middle ear. Now, that accounts for 1.5% of malignant tumors in the ear. Now, there are a low incidence, right, and these infrequent reports of this carcinoma. So you really need to be kind of on top of this, be looking out for that kind of a thing. Okay?

Now another, of course, is this reported acute or chronic dizziness. So we need to talk about the differences, right, between dizziness and vertigo. But in either case, patients should be referred to a physician if they are not already being seen and treated, treated by a physician for these concerns. Now, dizziness is just a general term and that's referring to just an inability to maintain normal balance. That could be described along with nausea, hyperventilation, faintness.

There's also lightheadedness, right, that could be due to circulatory problems, the sensation of spinning. So folks just might not have great, great proprioception either. You know, we have folks who are diabetic and they don't have great feeling in their feet. So just a sort of general imbalance, something to be aware of. Now, by contrast, vertigo is this feeling of spinning or feeling like the room is spinning around you.

Now, these symptoms that are caused by the inner ear and that vestibular system typically come on pretty suddenly without warning. So, you know, you could just have a small movement of the. That can bring on these feelings of dizziness, nausea, vomiting. Okay, so these are more positional issues. You could also just have inner ear dysfunction.

There can also be brainstem dysfunction and Even things like sudden changes in blood pressure or sinus infections can result in, you know, vertigo. That happens. Now, physical therapy can be really helpful if the cause is an inner ear dysfunction, but it's really important that make sure that we're referring for emergency medical referral if there are any symptoms that could be related to the brain or the heart. So numbness, weakness, especially just on one side of the body, any facial drooping, really elevated heart rate, photosensitivity. Okay?

So vertigo, like I said, is a vestibular symptom. And that is when patients have that sensation of spinning, right. Or sense of the environment spinning around them. So with this dizziness, those, you know, causes could be the result of medication, you know, an otopathological illness. Right.

We have vestibular dysfunction, acoustic neuroma, and then Meniere's disease as well. Now, I want to touch on Meniere's disease along with the this, you know, acute or chronic dizziness. So many A's disease is also known as endolymphatic hydrops. Now, it affects the inner ear and results in a sensorineural hearing loss, tinnitus, vertigo, and often a sensation of oral fullness. Patients might have these symptoms all at the same time.

They might be intermittent. They can appear separately. There is. There is no typical in terms of many ears. Now, the hearing loss can also fluctuate quite a bit, usually affecting lower frequencies at first, but it does typically spread to all frequencies as time goes on.

Now, unilateral hearing loss is also a cause for referral, especially if it is sudden or recent in that last 90 days. So unilateral rate is just hearing in one ear is normal, and there's hearing loss in the other. So this is not. Again, folks will. You know, when they're filling out their case history, they'll say, oh, yes, no, I have had a sudden hearing loss.

And often when you're reviewing that with them, what they really mean is, well, I have been struggling, and it seems more difficult lately. What we're really thinking about here is, I woke up and I can't hear out of this ear. That. That's the sort of thing we're talking about here. Right?

So this could be Meniere's disease, acoustic neuroma, trauma, autoimmune diseases, perforation of the tm, cholesteioma, otitis media. So anything that's causing a very sudden change, that's what we want to look out here for. Now, I know we talked about conductive hearing loss previously, but the criteria here is an Airbone gap greater than 15dB at 500Hz, 1000 and 2000Hz. Okay. This indicates that there is a condition that is potentially medically treatable.

Okay. Now, it's important to refer again for medical evaluation if this is being diagnosed for the first time. But if a patient has this known mixed or conductive hearing loss, repeated medical evaluation really isn't necessary. So there can be a number of causes of this air bone gap, gap in that outer ear and ear canal. You can have closure of the tragus.

Right. Where the tragus is covering the ear canal. You can have a collapsed ear canal. We often see this with patients who are much older. Right.

And they don't have as much elasticity in their skin anymore. And in the skin of the ear canal, we have atresia. There could be obstructions in that auditory canal. There could certainly be, you know, a foreign object in there, fungus. That's a.

That's one to consider also. And then, you know, typically, like I mentioned, mentioned earlier, there could be, you know, cancerous growths or pre. Cancerous growths. Now, there can also be causes of this airborne gap at the tm, so a perforation in the TM if there is scar tissue. Now, for myself, I had many infections, ear infections, as a kiddo, and my eardrums perfed several times.

I never had tubes because this was acute otitis media, not otitis media with a fusion. But the upshot is that I have scar tissue on both eardrums, even though it is not surgically related. So you could have thickening of the tm. You could have a very flaccid tm. You might have fluid in the ear, cholesteatoma.

Right. That glomus tumor. If we're then thinking about the middle ear, there are a number of things that can cause that airborne gap there as well. Otosclerosis, dysarticulation, fluid in the middle ear, mastoiditis, and cholesteatoma.

Now, we do want to make sure that if a patient is reporting pain or discomfort, if it is, you know, new pain, if it's around the ear, we need to refer for that as well. Now, I will say we typically end up with referred pain right between the jaw or the sinuses and the ear. I know when I have a sinus infection, my ears hurt even if I have no fluid in there. So this could be pain due to the. To a TMJ disorder.

It could be related to, you know, orthodontistry. Right. Or dental sensitivity. And Again, it could be sinus issues, like I said. So when we are doing a visual assessment, we should be able to tell, you know, if there is the presence of swelling, if the TM does not look the way that it ought to, if we don't see that cone of light, if there's any redness or drainage in that ear canal.

Okay. And of course, a disease or trauma or any of these acquired abnormalities could be at the source of this pain and discomfort as well. All of these things should raise that red flag and be referred for medical treatment. Now, I know excessive cerumen is everyone's favorite place thing and, you know, foreign bodies, right. In the ear.

Now, some of us feel comfortable removing impacted cerumen or foreign objects. I think my record for removing, removing domes or earbuds from a patient's ear was about six domes that were stuck down in that ear canal. Okay. So some of us are comfortable with that and some of us are not. If you are not comfortable removing any foreign bodies or, you know, this impacted cerumen, don't, don't do it.

Refer out. Okay? Now, you know, this can cause issues with any of the testing that we're going to do. So it can influence or impede impedance testing or emittance. Okay.

It can affect our audiometric results. You won't be able to do accurate probe mic measurements. If you do real ear measures, you wouldn't be able to take, make accurate ear mold impressions. And for those folks with high power hearing aid, right. Sometimes it causes excessive feedback.

Right. Or reduced gain because essentially at that point you have, you almost have a conductive hearing loss. Right. Because there is just this obstruction in the ear canal. So you should be able to see all four quadrants of the TM before you test or before you're making an ear mold impression.

So you also want to note the color and consistency of the tympanic membrane. All right, we're going to shift gears a little bit here to tinnitus or tinnitis. There is certainly some debate on how to pronounce this, but both pronunciations are, are accepted. So this is going to be, you know, sort of an intermittent or maybe even constant sound. And it's experienced in the ears of the head.

Head. It could be described in a number of ways. So common descriptions are ringing, roaring, whistling. I heard crickets or cicadas a lot. Humming, buzzing.

Right. So a lot of the times patients don't actually come into the office stating that they're experiencing tinnitus. It's likely that they say they're hearing ringing, chirping, humming. Okay. Most.

In most cases, the description of this sound isn't super important. And it doesn't always provide a lot of diagnostic information to the professional. But the important thing here is that the patient finds it important enough to tell you about what they're experiencing.

Now, tinnitus is not imagined. It is not a disease. It is a symptom of an underlying health condition. Now, the majority of tinnitus cases are going to be subjective rather than objective. Objective tinnitus means that someone else can hear the tinnitus that the patient is reporting.

So these are typically going to be associated with, like, vascular disorders. And it's really important that we make that distinction. So if they report that they hear a pulsing, Right. That is something that you want to consider, that description of sound, of the sound characteristics of their tinnitus. That's important.

Okay. Now, there are, you know, a number of tinnitus assessments out there. So this is just an example of a tinnitus health history questionnaire. This is where the patient can provide details of the tinnitus experience. It asks questions like, how long have they had the tinnitus?

What does it sound like? You know, is there a time of day when it's most bothersome? That just gives you, the clinician, a better understanding of what that individual is experiencing. And of course, keep in mind, no two tinnitus patients have the same experience. It's sort of like how there are no normal ears.

I used to have patients ask me, oh, is my ear normal? I learned that there is no normal. Everyone is unique.

Now, another very common tinnitus questionnaire is the Tinnitus Handicap Inventory, which is abbreviated as thi. Now, this is going to be applicable more for your patients who have very severe or

disruptive tinnitus. There are some folks who say, yeah, no, I have tinnitus all the time. Time. I hear it all the time.

But I just ignore it. It doesn't bother me. But there are people who have very, very bothersome tinnitus. So this kind of questionnaire can identify problems or specific areas of that patient's life that are affected by tinnitus. It can quantify the extent or the magnitude of the tinnitus impact on their daily life.

It can also help us serve as a counseling tool. Right. And we can also then monitor patient progress with a particular treatment. So that last application. Right.

That monitoring of progress is limited because these questionnaires aren't designed or validated to measure the effectiveness of tinnitus interventions. However, Administering a questionnaire like this for pre and post treatment can absolutely determine patient benefit. Okay, so again, this is the tinnitus handicap inventory. It asks asks questions that are also emotional in nature, like does your tinnitus make you feel upset? Does it make you feel out of control or frustrated?

The score of this thi indicates the magnitude of the impact of tinnitus on their life. And this could range from a slight impact to truly catastrophic.

Excuse me. It is dusty here today. For those of you wondering, on December 3rd in Tucson, Arizona, the high today is 78 degrees. So I will maybe be getting a tan later. Who knows?

Now, in terms of tinnitus referrals, I want to talk about urgent versus emergency referrals. Sorry, Siri was talking to me now. An urgent referral. This is going to be like that pulsatile tinnitus that I mentioned. So this is likely vascular in nature.

They need to see, you know, a medical professional who can follow up with this unilateral tinnitus. Anytime that we have unilateral tinnitus, that is a cause for a potential cause for concern, certainly a cause for question. Why do we only have this going on in one ear if there is any ear pain or drainage? Also, if these tinnitus symptoms are related to head or neck movement, I frequently saw patients who had been in car accidents. They might not have been severe car accidents, but you know, where they were rear ended and they had that movement of their neck.

Now, it wasn't always whiplash. It might not have been to that degree, but we know that issues with the head and the neck can result in tinnitus. Now, that often resolves over time. You know, it may just be sort of a tweaked nerve in that neck. But it's really important that we think about this as well.

So, yes, any symptoms that are related to this head or neck movement, and then if there are vestibular symptoms in addition to the tinnitus. So if they're having dizziness or vertigo now, I then want to say, in addition to these urgent referrals, emergency referral is warranted for patients who have a few things going on. So if there's any trauma, if there is a facial palsy, so something like Bell's palsy, if there's a sudden hearing loss, they need to be seen right away. Now, a really important one here is suicidal ideation. I want to make sure that we all recognize the gravity of this.

Like I said, there are those patients who say, oh, no, my tinnitus is, I just I ignore it. But there are some people who, it affects them to such a degree that they do consider suicide. So this is an absolute immediate emergency referral. We need to address this for these patients. So if you are at all concerned about the patient's well being, please, please do refer.

Now when we're thinking about tinnitus treatment options, you know there's no FDA approved method, right. I used to have patients, you know, ask if there are any medical methods for treatment of tinnitus, but there are not. There are treatments, but it's not going to be something like a medication. So no medications have really been shown to reliably reduce the perception of tinnitus. Now, in some cases,

tinnitus can be caused by a treatable medical condition like TMJ dysfunction.

Right. And if that's treated, that may very much reduce the severity of their tinnitus because we're addressing that underlying condition. Now, I will say research efforts are ongoing worldwide, especially by pharmaceutical companies in hopes of finding some medical treatment that would cure tinnitus or at least provide relief for the majority of tinnitus sufferers. So there are also some devices that have come on the market in the last couple years that are biofeedback devices that are also designed to reduce this perception of tinnitus or the impact of it. So they use cognitive behavioral therapy techniques to help patients adapt.

And the word has lost my mind, but I don't have aphasia. But essentially to help patients adapt to their tinnitus. This.

Now I know we're getting toward the end of our presentation, but I just have a few more slides for you. I want to quickly address ear mold impression safety techniques. So during otoscopy, modified ears, and then we'll quickly just look at this bridge and brace technique. So bracing during otoscopy really provides control to you and it prevents, prevents potential trauma if that patient moves unexpectedly. Our ears are sensitive.

I've had more than one patient kind of jerk, you know, because they just weren't expecting it, even though they knew I was going to look in their ear. Now, thorough otoscopy is really critical during ear mold impressions, especially if the patient has a surgical ear, if they have any history of a mastoidectomy, anything like that. We really need to be careful about this. We want to minimize any potential complications from performing an ear mold impression. So in this picture, I just want you to note how the fingers of that instrument or the hand bracing that instrument, they're braced against the cheek.

The fingers of the non instrument hand are bracing against the head and they're also pulling that pinna up to get better visualization. Now, the bridge and brace technique is recommended by the International Hearing Society to ensure patient safety. Safety. So both hands and the instrument that you're using are going to act as a unit and at least one of your hands needs to be in contact with the patient's head. Now, one hand serves as the bridge and is placed on the side of the patient's head near the ear.

The other hand holds the instrument steady and is either placed in very firm contact with the patient's head or securely in contact with the non instrument hand. So you can see in this first example example, during bracing for insertion of the otoblock, the instrument hand is holding the otolite right and firmly places a finger against the cheek. The fingers of that non instrument hand are pulling up on the pinna while bracing against the head above and behind the pinna. Then here is just another example of this technique using an impression gun. So the impression gun size provides using the instrument hand for bracing.

So that means that the non instrument hand is going to brace against the patient head and it also is going to serve as the bridge. So if you can see where the syringe is sort of sitting on the thumb, that's the bridge that we're talking about. So in this way, we're still bracing and bridging so that any movement of that patient won't result in trauma or accidental injury to the ear.

So I quickly want to address tympanometry. So tympanometry is a diagnostic procedure and it analyzes or examines the functionality of the eardrum or the tympanic membrane. I love tympanometry and I will die on this hill. It gives us so much insight into, into the function of that middle ear. Right.

It is really exceedingly important for us to know if there is movement of that eardru because it could be due to fluid, it could be due to, you know, otosclerosis. We don't know at that point, but it helps us, you know, get more information about what that patient is experiencing and what we can expect. It gives us information, right. Regarding the integrity and the movement of that tympanic membrane. And it helps

us understand the health of the middle ear.

So tympanometry is performed by completing otoscopy, placing that probe device in the ear canal. That pressurizes the ear canal and it makes the eardrum move back and forth. Measurements from that movement of the eardrum are recorded in a tympanogram now, we always instruct patients not to move or speak or swallow during the test because it'll affect their results. So we say be nice and quiet. Invariably some patients are going to say, oh, I hear it.

We know. So the test takes about two minutes or so for each year for each ear. And people of all ages can have tympanometry. Although I will say it tends to be trickier to get kiddos to get accurate tympanometry results. But as fate would have it, it tends to be extremely useful in diagnostic of fluid in that middle ear.

Okay, so again, it's just designed to measure how the ear responds to varied air pressure in that middle ear. There no risks related to the tympanometry testing. It will not perforate your eardrum. My mom hates it. She has very sensitive eardrums.

But I still make her do it because it's important. Now a normal temp results tell us, right, there's no fluid in the middle ear. The eardrum is moving normally. There's normal pressure in the middle ear. It also tells us there's normal movement of the ossicles and then normal normal pressure inside the middle ear can vary from positive 50 to negative 200 decapascals.

And that's for adults and children. Now, abnormal results. This is where we gets pretty powerful here, right? This can tell us or suggest, I should say it's not completely diagnostic, but this can suggest fluid in the middle ear, perforation of the eardrum. Right.

Scarring of the eardrum, which often results from frequent ear infections. That's me. Middle ear pressure that is beyond that normal range. Right. It can also indicate growth in the middle ear.

And it's also helpful in determining whether that occluding cerumen is actually blocking the eardrum.

And it also gives us some insight into whether that lack of mobility or other problems with the ossicles of that middle ear.

Now that brings us essentially to the end of the presentation. However, as we finish up, I just want to circle back to the importance of documentation. Now I will fess up as a clinician. You know, I know nobody loves doing notes and I, you know, often ended up staying after the workday to get them done. You know, it's really easy to get behind on notes, but it's so, so important.

We need to follow up with patients, right? We need to make sure we have a follow up plan. So that plan might be, you had a test today. This indicates normal hearing. We would like you to come back in about a year or so.

We want to monitor your hearing. If you have, you know, if you experience any sudden changes or if you have concerns, please come back sooner. So we want to note that in their chart note. We want to make sure that folks are aware of what their treatment plan is and that's whether or not we're making an outside referral. You know, some folks come in for cleaning of hearing aids twice a year.

I had patients who needed to come in every one to two months and sometimes that was because they had a lot of cerumen, sometimes it was because of dexterity concerns and they couldn't change the domes or the wax filters themselves. So we just want to make sure that we do have a good follow up plan in place. We want to make sure we're documenting appropriately. Again, using that SOAP note format is super easy and very clear and effective way of communicating your interactions with that patient. And we always want to remember, ultimately patient safety comes first.

They are at the center of everything that we as hearing health care providers do. And I don't know about you all, but you know, I often was the only provider that saw patients on a very regular basis and had the time and ability to talk with them and help them, you know, solve some of the issues that they were having. So we have the potential to fulfill a really important role in our patients lives. So we want to just make sure that we are doing the best that we can with that. Now that brings me to the end of my presentation.

Thank you again so much for joining us. I do not see any questions in the Q and A section again. Then once we're done here today, you want to go ahead to your pending courses. You can take a look at the PDF of the presentation and answer, you know, those few multiple choice questions. Please let us know if you have any questions or concerns.

And thanks so much for joining us today. We'll see you soon.