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## Managing the "Earie" Canal - Cerumen Removal

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- [Christy] And at this time, I'd like to introduce our guest speaker, Dr. Rita Chaiken. Dr. Chaiken is a private practitioner in Atlanta, Georgia, and an adjunct professor of audiology at Salus University. In addition, she was past president of the Academy of Doctors of Audiology. She has traveled in the US and internationally for over 20 years to provide cerumen management training to audiologists and AuD candidates, and was honored by the Audiology Foundation of America with its Professional Leadership Award for her work in this area. Thank you so much for being with us today, and at this time, I hand the mic over to you.

- [Rita] Thank you, and thank you to Audiology Online for inviting me to speak. I've been, as you said earlier, I've been teaching workshops and lecturing on cerumen management for over 20 years internationally and nationally, and I've actually been practicing cerumen management since 1991. So obviously, this is very important to me, and in fact, everybody should have a passion, mine happens to be earwax. And I'm excited to share this with you and I hope you'll gain some of my excitement as we go through the different sessions talking about cerumen removal. There are gonna be three parts to the webinars, and part one today, your learning outcomes will include your ability to be able to describe features of the outer ear, features of anatomy, some physiology, you will know lots of characteristics of cerumen, and you'll be able to at least name three contraindications to performing cerumen management on certain methods that we'll talk about. During the lectures, I'll be giving you some rules. Some are my personal rules, some of them are rules that you should definitely follow, and I'll start with the first one which is go with your gut. And what that means is go with that little voice that you hear in your head that says I can do this, I can clean the wax out of the ear, I can put my curette right behind the impaction and pull it forward, go a little deeper, or the one that says, eh, survey says I need to refer this patient away. And this slide, this picture reminds me of that go with your gut because this young lady was, at the time, my son's fiancee, and she came to visit me early in the relationship with impacted ears, and she was a law student and was wearing earbuds all day long, and it possibly helped make her ears impacted. And even after all these years of doing

cerumen management, I had to listen to that little voice in my head because of who she was because she knew I had a reputation as a cerumen queen, and I really wanted to live up to that reputation, not cause her any discomfort, and carefully remove the wax from her ears. It all worked out fine, got the wax out of her ear, I continued to get the wax out of her ears, and now I also clean the wax out of this little guy, that little guy, not this one, my grandson, and all is well, but the whole point was I have to listen often to that little voice still even after all these years. Usually, the trainings that I do have two parts. One is didactic, one is lectures of about four hours, and then there is a interactive part to the session where the participants get to touch the equipment, use the equipment and try all different types of equipment. Of course, this is, will only be lecture, but I hope you'll take the opportunity at other times to visit vendors at conventions or take courses that have an interactive session because nothing really takes the place of being able to use the equipment and experience it on your own, and it also gives you more confidence if you prepare with that.

The goal, our goal for all three sessions is that you are able to perform basic cerumen management techniques. And if you're already performing cerumen management to improve it and expand your services to know the whys behind what you're doing. And I'll add a saying that you'll be successful if you practice, learn the rules, learn the things that you need to do, and then practice. Practice on your family, practice on your friends, if they're really friends, they'll let you practice on them and your patients, and it'll be up to you to gain the confidence that you need. Really, the course itself is 90% confidence and about 10% technique, and this ought to become second nature to you, just like making an ear impression. And speaking of ear impressions, there are people who say, "Well, I don't want to do cerumen management, "it's so invasive." And I say to them what's more invasive? Placing an otoblock deep in the ear canal to or beyond the second bend, and then shooting foreign material into the ear, is that more invasive or less invasive than taking a little wax out of the ear? Think about that. We'll reach our ultimate goal by several steps. and today we're gonna go over several basics. We'll talk about anatomy, we'll talk about physiology, we'll talk about some cerumen information.

Later on in other sessions, we'll talk about lighting and magnification, seating and so on, and ultimately, we'll talk about the methods, and we'll, later in the session, at the end of the session, talk about some professional issues, and once again some of the rules and some of the whys what we're doing. A question I always ask is why should you perform cerumen management? And there are some who feel like I really don't want to do this and they shouldn't do this, and I'll tell you, some years ago, I was at a lecture and a well-known otolaryngologist and innovator Dr. Jacob Johnson put on a board, a blackboard, he put audiologists own the ear canal. And that really resonated with me because who's in the ear canal more than audiologists? And we're in there everyday, we know it well, and that's our venue. And you should perform cerumen management because you want to prevent postponing any services like audiological evaluations, making ear impressions and so on, and you want to prevent postponing use of devices. You want to reduce the difficulty and expense of additional appointments.

I know in my practice that patients sometimes have to be transported by family members who have to take off of work, or they themselves have to take off work, or they have to pay someone to bring them, and it's sometimes an additional expense to come to another appointment. Also, many physicians don't even do cerumen management, particularly primary care physicians. ENTs would rather be doing surgery. Oftentimes in physicians' offices, it's not the physician doing the cerumen management, it's some other person, perhaps a nurse or a PA or someone who's doing it. You performing cerumen management helps to prevent hearing aid malfunction, and still vendors say the number one malfunction in hearing aids is wax in receivers, wax and moisture in receivers. So if you can help control the cerumen in your patient's ears, that would help to prevent the hearing aid malfunction. Very importantly, performing cerumen management differentiates your practice. And now the advent in incoming OTC hearing aids, audiologists need to have one-stop shops, they have to perform all practice, all services that they're trained to do, and in most states, the cerumen management is in some way in their scope of practice for state

license laws in one way or the other. And lastly, it makes fiscal sense. I think that you taking courses, buying equipment, getting liability insurance and so on, you should be reimbursed, you should be compensated for cerumen management. And the warning here really is about you being careless. You won't have problems if you follow the rules as I first told you, go with your gut, and a few other rules like only stay on the wax, don't go on the ear canal, don't touch the ear canal, stay on wax, that's another rule. A third is you don't have to take 100% of the wax out of the ear, of course unless you're fitting extended wear hearing aids. And you shouldn't pull the skin lining off the ear canal, that could cause an abrasion, it could be uncomfortable for the patient. In general, we'd like you to think of wax as your patient's friend, your patient should think of it as their friend because we know that there are lots of patients who spend a lot of time in their ears trying to get wax out of it using all kinds of devices like paper clips, and I've heard scissors and knives and pens and fingernails, and we have to keep them out of there and tell them that wax is their friend. We also want to be sure that you minimize your liability. And while I said I think that they're, making a deep canal ear impression is more invasive than removing a little wax, a couple things you want to be sure of when performing cerumen management, one is proper training.

While I would love for you to have a hands-on session, proper training in this course will help you be safe performing cerumen management. You want to choose manageable patients, and I will tell you there are few patients that I think are unmanageable. I think most patients you can manage, and we'll talk about how you manage them a little bit later on today. And you want to use accepted techniques. We're gonna talk about irrigation, we're gonna talk about manual instrumentation removal, and we're gonna talk about suction or aspiration. We're not gonna talk about ear candling. I think ear candling is very dangerous. There is a lot of literature about the burns in the ear canal caused by ear candling, and it really is not an accepted technique for audiologists. In fact, I think that the first time I ever saw a patient whose ear was candled, their tympanic membrane looked like scrambled eggs. And everybody's got stories that might feel good, the warmth in the ear might feel good,

but it can be very dangerous. So let's start talking about case history, and I believe that whenever you see a patient, even if they come to you with a broken receiver wire that you know that's all you have to do is fix it, I think every time you see a patient, you need to ask them some case history questions, update the case history, and you need to look in their ear, you need to do otoscopy. In terms of cerumen management, some of the ear pathology questions or the aural history that you need to ask them is had they had recent or chronic otitis media? And if they have, I would suggest to you that you not use irrigation, you not flush water against the TM. If they have external otitis, what kind of cerumen management do you think you would do? I'd say you wouldn't do any. If they have a pathology in their ear canal, you want to stay away from managing that ear canal, perhaps sending patient to a physician. Now perhaps if the impaction or if the wax is very lateral or at the opening of the ear canal, you can remove it with a curette, but beyond that, I think that you should refer the patient if they're being treated by a physician for a pathology in the ear canal. If they're post-otic surgery, if they've had surgery on the ear canal or in the ear, and I say six to 12 months, that's a contraindication for performing suction.

There are some studies have shown that the noise from the suction in post-otic surgery patients causes tinnitus. So that along with patients who have tinnitus normally and patients who are hyper acoustic would be contraindications to doing suction. Also, there's a history and treatment for external ear pathology, similar to the external, otitis, but if they have a history and treatment of external ear pathology, I would stay away from irrigation as well, and we'll talk a little while about some of the reasons why irrigation is contraindicated in the ear canal period. General health. In terms of general health, there are several things you want to be aware of with your patients. If they have cardiac problems, if they have heart disease, you really just want to be aware of it. There can be, when working in the ear canal, cardiac depression, lightheadedness, fainting in someone, and if you know ahead of time, I wouldn't say don't do, I would say it's good, it's okay to do cerumen management, you just want to know what kinds of problems patients have, and I'm not talking about just taking aspirin, baby aspirin at

night, although I know that's really being done on a more limited basis now, talking about people who have really some cardiac problems. If they have systemic diseases, if a patient has a systemic disease in this group, like chronic bleeding disorders, hepatitis, HIV, diabetes, which you know is really an epidemic in this country, those patients are immunosuppressed, their systems are immunosuppressed. And what I am most concerned about with them is infection that you cause. So I will tell you go ahead and do cerumen management, but you really need to be sure that the instruments you use, that are clean and sterilized or disposable, and that your hands are clean and that the environment is clean so that you don't transmit infection to those patients. And lastly patients who are dizzy, you know obviously not to do irrigation with those patients. Certainly patients who have otalgia, you want to consider why they have otalgia, why there may be pain in their ears, and perhaps refer those patients. A patient's medication is very important for you to know, and that's one of those questions that you need to ask each time you see them. Patients don't equate medications they take with your need to work in the ear canal. So if a patient is taking an anticoagulant or an antiplatelet, what does that mean? Those are blood thinners. You can and you should do cerumen management with those patients, you want to be conservative with them, you don't want to cause bleeding.

And again, what worries me with bleeding is infection. If they're taking thrombolytic medications, thrombolytic medications has to do with heart disease, with cardiac problems. And as I said earlier, if there's a cardiac problem, it's okay to do cerumen management, you just want to know ahead of time that the patient has some issues, you want to be conservative in your touch of the patient's ear, and you want to be aware ahead of time that there's a possibility that there may be a problem if they stimulate a certain area in their ear. If a patient is taking prescription ear drops or creams, what kind of cerumen management do you think you should do? Eh, I say if they're taking prescription ear drops, they must be being treated for something. Sometimes the reason they're using drops or creams is because their ear needs to be moisturized because it's dry. I certainly wouldn't do irrigation on a dry ear, that's

chronic dryness, but you need to find out why they're taking the ear drops and what it's for, and perhaps if it's a treatment of a pathology, you want to stay away from doing the cerumen management. If a patient is taking steroids, if they are undergoing chemotherapy, if they have radiation of the head and neck, their ear canal may be more sensitive to touch. Just be aware of that, doesn't mean you can't do cerumen management, but their ear may be more sensitive to touch, and they also may be more susceptible to infection. So you want, again, to be very careful about what you do with those patients, that makes me feel like irrigation may not be a good method for them, and you want to really be careful when you're working in the ear canal there, of those patients particular. Herbal supplements and vitamins. Many times, I know I've seen physicians, and they'll ask me all about my prescription medications, but they don't really ask me what I'm taking that's over the counter. That is really important for you to do each time you see patients because there are drug interactions that may be a problem for a patient. I've given you several resources to look about drug interactions of patients particularly when it's over the counter, supplements and vitamins. I do want to bring up something interesting, all of these herbal supplements have some blood thinning properties.

So if a patient is using some of these products, and they're also taking an anticoagulant or an antiplatelet, you may want to suggest to them that they talk about it with their physician or their pharmacist because you're using two kinds of blood thinning agents. And interesting, you'll notice that are on this list I have garlic, I have ginseng, I have ginkgo biloba, I have glucosamine, I have ginger, all starting with the letter G. I was told once by a nurse that any of these herbal supplements that start with a G are blood thinners. I'm not really sure that's true, I looked them all up, but that gives you an idea if a patient is telling you that they take one of these that they may want to look it up or you may want to look up and see if there is an interaction with some other product, that they're taking another prescription drug that they're taking. Otoscopy. As I said earlier, every time you see a patient, even if they're coming in with a broken hearing aid, I believe you should take a look in their ears. And if you see

signs, otic discharge in their ear, what kind of cerumen management will you do? I say you don't do anything if there's a discharge from the ear, but you refer that patient on. If they have ventilation tubes, PE tubes, what kind of cerumen management will you do? I will say, you don't want to do irrigation, you don't want to shoot water into their middle ear, so certainly stay away from irrigation. Same with a TM perforation. If you know or you can see that they have a TM perforation, you don't want to do irrigation with them. If they have dried or cracked skin, you need to find out why they have dried or cracked skin. Is it something that they need a moisturizer for? Is it a pathology that needs to be treated? And certainly if they have dry skin, don't do irrigation that changes the pH of the ear canal, the pH factor in the ear canal, and that may also cause infection in their ear. If they've got an open wound in their ear, work around the open wound. I wouldn't do irrigation, and I think you could use a curette to move some wax away, you want to stay away from the open wound, and you want to, again, be thinking of your infection control and how clean your instruments and your environment is. If they have foreign bodies in their ear, and I kind of laugh at this one because I think the foreign body or bodies that I see most in patients' ears are wax guards or domes for receivers, and I kind of laugh because I can understand maybe once, but sometimes you'll see patients come in with two or three wax guards or domes in their ears, and you want to think, where do they think it went after the first one?

So I blame myself sometimes for not giving them enough counseling, or then I just start to wonder about my patients. If you cannot see the tympanic membrane, if there is a plug in the ear, if there's a wax plug in the ear and you cannot see the tympanic membrane, you can't do irrigation. You can't do irrigation if you don't see the TM. What do you need to do? You need to check the integrity of the tympanic membrane, and how do you do that? You do that with tympanometry, and if you have a wax plug in the ear, it may be awfully hard to get a tympanogram on those patients. So if you can't do a tympanogram, you can't do irrigation, and what's suggested is that you move some of that wax away, dislodge it so that you can do a tympanogram. And I say if you can get a tympanogram, you probably can get enough room in there to put a curette behind the

impaction and pull it forward, and we'll talk in another session about how to move the wax and other alternatives to even using a curette, but certainly, that would be another method of doing cerumen management without having to do a tympanogram and without having to shoot water in their ear. Lastly and just an addition, even though this isn't about otoscopy, the course, I want to urge you to check the pinna and the mastoid when you do an otoscopic examination. It's really very important, who else really looks in there, besides an audiologist, who else looks behind the ear and in the concha? Maybe a hairdresser, but I'm not sure that they oftentimes will let you know that there is lesion in the ear. So I have a series of pictures here, and I thought I would point them out to you and let you decide what type of condition you're seeing each one. It's either squamous cell carcinoma, contact dermatitis, a basal cell carcinoma, or a melanoma. Again, this is part of your evaluation, your otoscopic examination. So take a few seconds, or you can just stop the recording and think about this and jot it down, and come back to the recording because I'm gonna give you the answer in just a minute.

Okay, we have here a basal cell carcinoma. Kind of looks like just a little infection in the ear, or just that somebody picked at their ear or something, it doesn't look very serious, but basal cell carcinomas are very serious because when they're neglected, they can invade the areas around the ear and intracranially. We have a melanoma, a mole, could be just a little dark spot that you see, this is, as you can tell, it's in the concha, just a little dark spot, but you know how serious melanomas are. In fact, I taught this class a couple years ago and a participant contacted me afterwards and said how much they appreciated that I brought this up because they saw something on their patient's mastoid following the class, and it turned out it was a melanoma and the patient couldn't have been more appreciative. So, it's minor things to look for and look at, not time-consuming at all, recommend that your patients see a physician, a dermatologist, an ENT because you can't diagnose what it is but you can note that you are referring the patient suggesting that he see another professional. Here we have squamous cell carcinoma, those are six times more prevalent on the ear, on mastoid,

head and so on than the basal cell. They are growths that can spread to the lymph nodes, if untreated. And lastly we have contact dermatitis, which is really adverse reaction to jewelry, but you see how similarly some of these things look, and you can't really tell yourself, you need to refer the patient to determine, let somebody else determine what's on their ear. A couple of other things I want to talk about in terms of otoscopy, one is oftentimes, certainly you have patients referred to you, and a medical referral, somebody in an office is sent to you for a hearing evaluation or a ear impression to be made, and on the otoscopic examination part of the referral, they will write to you and they'll write the letters WNL. What does that mean? Most of you probably think within normal limits. I say it's we never looked. And the reason for that is how many times do those patients come to you as referred for an audiological or impressions, and they've got wax in their ear, enough wax that it obviously needs to be removed? So always look in the ear canal when the patient is referred to you and when they come to see you. I want to talk a little bit about your method of doing otoscopy, and normally, I want to see if this video is pretty much what you do. Let's go ahead and show the video. So what you do is you pull laterally and superiorly, you'll pull the pinna laterally and superiorly, and say, a few inches away from the ear and look in the ear canal, look all around it, and at all points.

Okay, and I think that's pretty much the standard, wouldn't you say? Is that how you perform cerumen management? I think we're gonna go back to the presentation, and I will tell you that if you get nothing else from this presentation, I'd like you to change the way you do, I'd like you to change the way you perform otoscopy. I'd like you not to bend over, I'd like you to be eye-ear level, I'd like you to either stand eye-ear level, I'd like you to, if your patient can be moved up and down in a chair, I'd like you to, you can stand if you're high enough, you can stand, you can sit, but as long as you're eye-ear level, you will see a different ear canal. And I think this applies to making an ear impression, to placing an otoblock, to placing a probe tube in the ear, so let's show this slide. Okay, eye-ear level, I'm bracing the head as I did earlier, I'm looking in the ear, I happen to be bending over a little bit, my head, just because I was in a situation

where I couldn't raise the chair, but you get the general idea of looking in the ear, eye-ear level, you will see a different ear canal. So when you go back to seeing patients after this day and after this course, I'd like you to try it both ways and see that you will have a different look at the ear canal and we'll go back to the presentation. This is another look at, this is another look at the standing and bending as opposed to looking eye-ear level. It really, listen, as you age, it's gonna make your back better over time as well. And a question I have for you is let's say you are doing an otoscopic examination correctly and you start to pull laterally and superiorly to the patient's ear, and the patient complains of pain, and no, it's not 'cause you're squeezing the pinna too hard or too tightly, if they complain of pain, why do you think that might be? One reason is that there might be infection between the end of the impaction and the TM. And why might there be impaction? Because it is unventilated, there's no ventilation, and wax is moist, and there might be moisture caught in there. Another reason why there may be pain is that the impaction is so long and so hard that it's rubbing against the TM. And one of my personal rules is that I don't do pain. So if I'm manipulating the ear and my patient is complaining of pain, I will refer them. All right, let's talk about your anatomy, let's talk about the ear canal.

And I have a few points I want to stress with you. One is you'll remember that the ear canal is longer inferiorly. The inferior part of the ear canal along with the anterior part which is the part that, closest to your, towards your nose, towards front of your face, they're about an average of six millimeters longer in adults. And the reason I mention that to you, it's kinda like real estate, location, location, location, you'll have more room to work in that area and the wax may also get pushed back further into that area. Also, the inferior canal wall, and this is really important, is more sensitive than the superior canal wall. The inferior canal wall and the posterior, which is towards the back of the head canal walls are more sensitive. So I said earlier, don't touch the ear canal, but if you have to work in an area or if you have to touch the ear canal, having the chance of touching it superiorly if that's gonna need to happen will be more comfortable than if you touch the inferior canal wall. A couple of other areas, you know that we have the

cartilaginous portion of the ear canal that has the glands in it, the wax glands in it, and the osseous portion of the ear canal. And between them or the meeting point, the juncture is called the isthmus. And that isthmus is your nemesis. The isthmus is, ear canals aren't normally this straight, the isthmus is usually like an hourglass and wax gets caught back in there and we have to be able to squeeze it through that isthmus to get it out of the ear, and I'll that talk about how you do that at a later date. I also want to mention to you something that you may have learned in school, and I don't think I did, and it wasn't until I did research to start teaching these courses that I learned about the Fissures of Santorini. And the Fissures of Santorini are tiny clefts in the ear canal made somewhere near the isthmus, and they communicate with the parotid gland, they communicate with the parotid gland. And that's important to us one more time because of causing infection, we don't want infection to be transmitted through the parotid gland because things aren't clean or because there are bacteria in what we're using, we don't want it to be transmitted through the parotid gland and perhaps even causing, if it is transmitted, a neuropathy.

And so again, one more time, it's about infection control. The external ear also as we said is sensitive to touch, and because the bundles of cranial nerves that feed into it. We know about the Arnold's Reflex which is due to the vagus nerve, it's a vagal reflex, and that causes coughing, sometimes sneezing, can even cause fainting. And when that happens, you remove your instrument from the patient's ear, you give them some water, you perhaps give them a candy or whatever, and then go back and work in a different area of the ear canal. The external ear is also susceptible to bleeding, and while I've been told, I don't know if this is true but I've been told that you can't bleed to death from the ear, it seems like you're bleeding to death from the ear, and again, my concern, my greatest concern, given that the posterior auricular vein connects to the jugular vein is transmitting infection. Be very careful about transmitting bacteria or infection into your patient's ear. All right, that's it in that area. We're gonna talk about cerumen now, and you know that cerumen is in this dark, moist environment it's a protective coating to the ear canal, it moisturizes the skin lining, it's deterrent to foreign

objects, it assists in the migration of skin from the tympanic membrane and the ear canal out of the ear, it has some, perhaps some antimicrobial properties, but it also is more prone to skin infection than any other skin surface, and that's because it retains moisture. And moisture changes the alkaline level and can breed infections. So often times when I'm talking about you don't want to do irrigation because you don't want to cause a change in the pH of the ear and cause ear infection, it's because of changing that alkaline level. The ear canal has the glands we talked about earlier, they have ceruminous glands and sebaceous glands, and both are enclosed in muscle tissue and release their secretions into hair follicles in the ear canal and also into the pores. The ceruminous glands are modified apocrine glands similar to the glands under your armpit, sweat glands, they are sweat glands, and interestingly, they're controlled by the sympathetic nervous system. And what that means is that they are affected by certain things like self-manipulation, so people who think that cleaning out their ear is gonna make them have less wax may actually be stimulating the wax secretions in their ear. The sympathetic nervous system affects health, it's affected by health conditions, so if certain health conditions like hypothyroidism, a patient has hypothyroidism before it's treated, the secretions of the ceruminous glands are often thick and milky and white and don't migrate out of the ear as easily until they're treated. Certain medications will affect the secretions.

And in general, it's interesting that that sympathetic nervous system does control those glands. On the other hand, sebaceous glands are oily glands, they're holocrine glands similar to the secretions from acne on your face, zits on your face for oily glands, so it's the combination of those two that we know of as the wax or the cerumen that is secreted into the ear canal. And how does the wax migrate? So it starts with a keratin layer of skin on the tympanic membrane, you may remember there are three layers of skin, three layers of the tympanic membrane. The outer layer is the lateral layer is the keratin layer, and it sloughs off the tympanic membrane like the skin on your body sloughs off and regenerates constantly, and as does the skin on the ear canal itself. At the isthmus, it meets up with the secretions of the glands, with hairs that are in the ear,

with dirt that's come in from the outside, and it migrates out of the ear. And the way it migrates is through a centrifugal motion. It's a motion that helps to move the wax out of the ear. It's the motion caused by talking, chewing, smiling, eating, so on, and that helps push the cerumen and migrate the skin and so on out of the ear. So think in the idea of your sedentary patients in nursing homes who perhaps are on soft diets, who perhaps don't have their teeth in their mouths, who aren't necessarily communicating or talking much to people, and it makes you understand why cerumen impaction is so prevalent in nursing homes. It takes about six to 12 weeks for the migration of that wax out of the ear. They put a dye on the keratin layer and measured it several times coming out of the ear, it takes about six to 12 weeks, given normal centrifugal motion of the mouth and jaw. Here I have a picture, I didn't have one of wax migrating out of the ear, but this is a myringotomy scar soon after the surgery and you see it starting to migrate out of the ear, and after about a month, you can see how it is migrating out of the ear canal, drawing up and migrating out of the ear canal.

Cerumen buildup causes problems, and it also, think about why we have cerumen buildup. And sometimes of course it's because of stenosis, if you have a stenotic ear, you know that wax won't be able to migrate out normally. Cotton swab use, there are people out there who are cotton swab junkies and are always using Q-tips or cotton swabs to, they think take the wax out of the ears. I know I've seen impactions where you see a little dent in the impaction from the tip of the cotton swab, and we really need to counsel our patients that it's plugging up the ear and it's not really removing the wax, even though they see a little bit of yellow perhaps, a little bit of wax on the Q-tip when they take it out. Cerumen builds up certainly because people are wearing hearing aids for many hours in the day, or hearing protection. Radiation. Radiation causes the ear wax to be dry oftentimes, head and neck radiation, so it's not as easy for it to migrate out of the ear. Hypothyroidism I said earlier, until it's treated, it's a thicker secretion, thicker white secretion. Canal hair. Certainly you've seen patients that have almost, I don't know, forests in their ear, and I always think it's kind of funny that I see patients who are male patients who have lost the hair on their head and

somehow or another, it just seems to migrate into their ear canal, and sometimes it's very difficult to clean the wax because of the canal hair in a patient's ear, very rough hair that's in there ear sometimes, and thick. Aging. Aging is, as I said earlier, patients who are sedentary sometimes will, you'll see that they have much greater buildup of wax in their ear, and the other part of aging is that as you age, and it's true all over your body, you'll start to lose elasticity and fibrous support. So too in your ear canal, sometimes you will have a flaccid or collapsing ear canal that doesn't help push the wax out of the ear canal. When you have an impaction, it causes other problems. I talked earlier about external otitis, and that's sometimes a problem when there's an impaction because of the moisture that gets lodged in the, behind the impaction and there's no ventilation. Keratosis obturans is a defect in the lateral migration of the skin from the keratin layer of skin and the skin of the ear canal, and it builds up, builds up, builds up, and some wax starts to also build on it, and it looks like a wax impaction, let me show you a picture in a minute, it looks like a wax impaction, but to touch it is pain, it is painful, and that's something that you absolutely have to refer to a physician and it needs to be treated, needs to be debrided and a topical steroid put on it.

Cerumen impaction causes certainly hearing aid problems we talked about earlier. It doesn't really cause tinnitus, it might make the tinnitus sound louder because they're not masking out the tinnitus. and you know it can cause hearing loss. Here's a picture of a beautifully pristine ear canal. You can see the TM, the umbo, the cone of light, here are the hairs in the ears in the ear canal. Now you start to see some of the cerumen that is secreted onto the skin, and you can see here tiny droplets of cerumen on the hairs, you start to see the buildup of it here in the ear canal, and I love this picture, and I hope you'll take a snapshot in your head of it 'cause I want to refer to it later on. Here is a cerumen buildup. This is soft cerumen, and you'll hear in a later session that I think you probably could use suction to remove this, but if you used a curette, that's the hole that you want to put your curette in, your angled curette to pull it forward so that you can start to remove it from the ear. So when we start talking about removal, I hope you remember that picture. Here you see some of the dried skin

that's going to slough off the ear canal. I urge you not to pull it off, but for demonstration purposes in this picture, you can see it's been pulled off and you can see the tiny blood vessels of the ear canal. Another series of slides that I have for you, a series of pictures that I'd like you to take a minute to look at and decide what you see, consider what you see. Take a minute here and perhaps jot down what you think. This is, your choices are keratosis obturans, acute external otitis, it could be a foreign object, or otomycosis. So give you a couple seconds take a look at that. And I will present the answers. This is acute otitis externa, and you can see that it could look like earwax, don't clean this out, it's very wet and moist, damp, and you want to refer that patient. What concerns me about the external otitis is in your immunosuppressed patients, your diabetic patients and so on, what concerns me is additional infection that would cause it or if you caused the infection, if you cause bacteria to be in there because that can turn into osteomyelitis or malignant otitis externa, and it's dangerous in immunosuppressed patients. Here we have otomycosis, and otomycosis is a fungus. It's a fungus superimposed on bacteria generally, it's found in warm, damp climates of the islands, Southern California, South Florida and so on. It's itchy, it's smelly, and you don't want to be cleaning this out of the ear, and you want to refer this patient.

Here we have a foreign object that looks like maybe an otoblock or it looks like a, some sort of sound plug or whatever that's in the patient's ear. Of course, you can easily take that out of the patient's ear and we'll talk about how later. And lastly we have keratosis obturans which is what I referred to earlier, the defect in the migration of the keratin layer of skin, and you can see it also can cause kind of some erosion in the bony area, it may cause that if it's left in there long enough. And as I said, it needs to be debrided, a topical steroid put on it, and it can be very uncomfortable and very painful to the patient. Cerumen, not having enough cerumen also causes some certain conditions. And why doesn't somebody have enough cerumen in their ear? Sometimes it's because of those cleaning junkies, those people who are cleaning their ears all the time, people who are swimmers and are in the water all the time. Sometimes the water causes the infection because of bacteria in the water, but sometimes the constant

flushing in the water of the ear canal causes them not to have enough wax. Radiation, and radiation can cause several problems, it causes, can cause dry wax, it can cause elimination of the wax from the ear so that you don't have enough, and it causes ear sensitivity. Also not having enough wax in the ear may cause sensitivity to wearing the hearing aids, inability to wearing hearing aids because there is no wax to line it. And certainly, foreign bodies and dirt have more of a chance of getting into, towards the TM. We have here a wax plug, and the first slide is we see is dark wax. There's that little hole that I would put the curette in. The dark wax, when wax gets oxidized, it is, gets darker from the oxygen. We see dry wax here. Here we see that skin. That dry skin is gonna slough off that we don't want to remove, but in this picture, the person who was taking the slides decided to remove the wax, and you can see, you're pulling it right off the skin, and the more you pull it off, the more irritated towards the end the skin gets. And it doesn't look like there was an abrasion, doesn't look there was bleeding, but there certainly could have been. Dr. Wayne Staab published this, had this published several years ago, and you can see that the incidence of cerumen impaction as I said earlier in nursing homes is very great, and in normal healthy and in older adults as well. I wonder if the study was done now with the way young adults are wearing, and even older children are wearing earbuds all the time and receivers in their ears that perhaps these numbers wouldn't be greater because of wax not being able to migrate out of the ear.

An interesting conversation is about the different coloration of the wax and consistency and so on. So certainly, cerumen varies in color because of dirt, and the consistency generally, the harder the wax, the darker it is. And the harder the wax is because it's been in the ear longer so there's more oxidation, which also adds to the darkness of it because when the oxygen hits the wax, it causes it to get darker, so oxygen has that effect on the earwax, on the age of it, the darker it gets. A very interesting anthropological bit of information that I came upon is that Europeans have soft sticky wax, black Africans, soft honey-like wax, and Eastern cultures have dry, flaky wax, flakes of skin, flaky wax because they have underdeveloped or absent apocrine glands.

And I think that's really an interesting bit of anthropological information that you would not necessarily consider. And that brings me to the end of the presentation today, and thought there's, there are people who say there's nothing funny about wax, I have several things to say about it, but hopefully you will read this little cartoon. And if there are any questions or anything that I can answer for you, I have my contact information here. I hope to see you at part two of this series for more information, and have a good day.