Ring! Buzz! Chirp! Part 2: Evaluating and Treating the Tinnitus Patient

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- Thank you personally for spending the next hour with me. I'm very passionate about the topic of tinnitus, so I'm really excited to teach you. So today's course is Ring! Buzz! Chirp! Part Two: Evaluating and Treating the Tinnitus Patient. I'm excited to get into this with you, and before we get started, I do wanna go over some housekeeping. So how do you ask a question? If you have questions, I would love to answer them for you. If you look at your screen, there should be a little icon for Q and A that looks like a chat box. It is different than the chat, but go ahead and click on Q and A and write in your answers.

I'll try to check it as I go through the presentation. If I don't have time to look at it in that moment, I will answer questions at the end of the presentation as well. There's also a handout for today's course. In the handout I have some extra supplemental information that you might find beneficial. You can find that in the chat of today's presentation, or you can go to pending courses on your Audiology Online account. Click on Ring! Buzz! Chirp! Part Two, and you'll see a PDF of today's handout as well. How do you earn CEUs? So in order to earn CEUs, you do need to have a paid Audiology Online CEU access membership. If you do have it, you're gonna go ahead, finish the course today, and then you'll go back into your pending courses in your account and take a short five question multiple choice exam.

I promise I will give you all the answers during the course of this presentation. Now in the mean time, if you do need any type of assistance or if you're having any technical issues, there's a number on your screen currently that you could call. You can also send an email to customer experience at continued.com, or type it into the Q and A window and we will try to help you get whatever assistance you need taken care of. Today's course has three objectives. Sorry, I'm having a little trouble clicking today. After today's course, you're gonna be able to evaluate the severity of a patient's tinnitus. You're also going to be able to counsel patients who have tinnitus, as well as name at least five different options for treatment of tinnitus.

So let's go ahead and get started. Now before I jump into evaluation and treatment options, I wanna do a quick review of the first part of this presentation. If you haven't seen the first part of this presentation, it is available on AudiologyOnline.com to view at your own convenience. But just to go through this in a little more detail, let's talk about tinnitus. I am sure you have experienced a patient come in with the symptom of tinnitus, and every single patient is going to have unique symptoms. Including what it sounds like. Some people might say it sounds like a clock ticking, some might say it sounds like a roaring sound, a tea kettle, wind, crickets, ringing, doorbells.

There's a whole variety of different sounds a patient may here that could be tinnitus. So in order to know what tinnitus is, let's look at the definition. So tinnitus if you look it up, if you Google this, go to your dictionary, you're gonna find a definition similar to this. It can be pronounced TIN-it-us or tin-NITE-us, and it's gonna be a sensation of noise such as ringing or roaring that is typically caused by a bodily condition like wax in the ear or some type of disturbance of the auditory nerve, and it's usually subjective, which can only be heard by the person who is experiencing the tinnitus. So we mentioned objective tinnitus in this, or subjective tinnitus here, but there's also objective tinnitus.

So we know the definition of tinnitus now. So let's break this down even further. When you're classifying tinnitus, you're gonna classify it a couple of different ways. The most common way to classify tinnitus and one of the most widely used ways is going to be calling it objective or subjective. Objective tinnitus is tinnitus that's audible to another person. So there's still no external noise for us, but someone else can hear that tinnitus as well. They can hear it just by using their ear. Sometimes they'll use a microphone to be able to hear it or a stethoscope. Usually the acoustic source of it is something like muscle spasms or a vascular tumor that can be causing that objective tinnitus.

Objective tinnitus is very rare. It occurs in about 1% of cases. The more common one we're going to see is subjective tinnitus, which is tinnitus that's only heard by the patient. It could be idiopathic or it may be because there's a comorbidity or it could have an underlying cause. This is gonna be 99% of all cases. So because we know that subjective tinnitus is kind of a broad category. Objective is less of a broad category. We can further classify tinnitus into primary and secondary tinnitus. So primary and secondary tinnitus is another way to classify tinnitus. I like talking about secondary tinnitus first because it tends to be a little more rare. So when we're talking about secondary tinnitus, it's going to have an underlying cause that can be found via evaluation.

So it could be something as simple as wax in the ear, it could be something more complicated like a tumor, cardiovascular issues, but usually it is not connected to sensory neural hearing loss. So the cause of this tinnitus is usually known, and with secondary tinnitus, if you treat the cause of the tinnitus, the tinnitus tends to go away. So for example if someone has wax in their ear that's causing tinnitus, by removing that wax, you will see them get relief of their tinnitus. With secondary tinnitus, one quick way to know it's probably secondary is if a patient reports pulsatile tinnitus. More than likely, pulsatile tinnitus is gonna be secondary, meaning there's some type of cause to it that can be treated.

And of course if your patient has pulsatile tinnitus, you should make an appropriate referral to their primary care physician or an EMT doctor. So now let's talk about primary, 'cause that's gonna be the bulk of your patients. Primary tinnitus is the most common type of tinnitus. It's going to be broken down into three different characteristics. Primary tinnitus doesn't usually have one underlining cause, it can be completely idiopathic. It is pretty common to occur with sensory neural hearing loss. When we're breaking down primary tinnitus, we can break it down into temporal

characteristics. So this is gonna be how long does a tinnitus occur? Is it spontaneous? Does it happen temporarily, like for a few hours to a few days?

Is it occasional? Happening maybe once a week, once a month? Is it intermittent or is it constant. We're also gonna look at things like the duration. When did the tinnitus start? Is it reset within the last six months, or has it been persistent over six months? And what's the impact of the tinnitus on you? Is it bothersome or non-bothersome? And these are all things we want to gather when we're classifying the patient's tinnitus because it's going to guide us into our evaluation as well as treatment options. So now that we've learned a little bit about classifying tinnitus, I wanna review the tinnitus patient. The tinnitus patient is gonna come in and are gonna present with different symptoms.

So they may or may not have hearing loss, but they're gonna be talking about some type of noise in their ear. So it could be a ringing, it could be a hissing, it could be static, buzzing, waterfall, crickets. We wanna look into their presentation, how they describe it. We also wanna make sure that we're not getting confusing tinnitus with other auditory hallucinations. So we're gonna look at their presentation. And then we're also gonna want to know about the quality of life impacts. This pie chart is really important, I'm actually gonna come back to it when we're talking about evaluations, because every tinnitus patient experiences tinnitus differently. Some people, they have no problems. It might just be there, it might be annoying, but they can live with it.

But with patients who have severe tinnitus, it can cause many other problems. It can cause sleep problems, anxiety, social isolation, trouble concentrating, depression, it can affect their socioeconomic wellbeing. They might not be able to work because of their tinnitus. So this is all important for us to know when we're going into that evaluation. And with tinnitus, there is research showing that a patient can have the same symptoms of tinnitus, but how they react is going to affect it. So I call this the

vicious cycle of tinnitus. So when a patient comes in with tinnitus, they may have negative reactions, and because they have negative reactions, it's gonna create a higher level of arousal, which is gonna escalate that tinnitus, making it have a bigger negative reaction, a higher level of arousal.

They haven't learned how to ignore it. So what our goal is with the evaluation and treatment of tinnitus is kind of breaking this vicious cycle for them. And I'm going to talk more about this in just a minute. But, I want you to remember when a patient walks in the door to see you, they've already created their own attitudes and beliefs about their tinnitus. They've probably Googled tinnitus and read all about it. They may have talked to other providers about it. You don't know what they've done before they've gotten to your door, so it's also important to ask them what have they done. So now let's say that a patient comes in who is experiencing tinnitus, they come in, what are you going to do?

And this is gonna be the evaluation and assessment portion of the tinnitus patient. So I wanna break down the evaluation portion and treatment into four categories. We're gonna have a self-assessment, the case history, the audiological assessment, and then counseling and treatment. And with the self-assessment and case history, we're trying to quantify the tinnitus symptoms as well as measure them during the evaluation. So we're gonna have subjective measurements like our tinnitus questionnaires. We're gonna consider mental health questionnaires, and then we're gonna do some objective measurements. And with the tinnitus patient, based on that first evaluation portion of it, so going through the case history, going through the self-assessment, I may break up my appointment into two, and I'll explain why later.

So with the self-assessment, woops. Let's go back a couple of slides. There are many different self-assessments out there for tinnitus. I've listed a couple that I really like on this slide. A quick Google search will pop them up, including how to score them. The

most common one that you've seen out there is probably the Tinnitus Handicap Inventory. It's a 25, it has 25 questions or statements, and the patient fills it out as yes, sometimes, never. It's very commonly used, so I'm not gonna talk about it. But it is a great resource. I'm going to focus on my two favorite, the firs tone being the tinnitus and hearing survey. So this is a really simple questionnaire. It has three portions to it, only 10 questions, very easy for your patient to fill out.

And I like this because it breaks it down into is the patient experiencing issues because of their tinnitus, because of their hearing loss, or because they have decreased sound tolerance. So we're really gonna break it up based on that. So we're gonna ask questions that's specific to tinnitus. We're gonna ask questions specific to hearing. We're gonna ask questions specific to sound tolerance. And the reason I really like this is because it breaks it up. A lot of times patients will associate their reactions, the issues that they may be having to tinnitus, and not their hearing loss. When we're thinking about hearing loss, most of the time hearing loss isn't occurring overnight. It's gradual, many of the patients you probably see, many of the patients I used to see when they came in for their initial evaluation, it was usually because somebody else had them come in.

It was usually because everybody else says I'm not hearing well, I think I'm hearing okay, but people are mumbling. And people don't realize they have hearing loss because it's come on so gradually. So they forget things like the turn signal in the car makes a noise every time we turn it on and off. That the microwave beeps, that the fans in the house are loud. So because hearing goes away so gradually, they may start noticing the ringing first and not notice a hearing problem. Then they fill this out and you're like okay, so this patient has tinnitus, but it looks like hearing is the bigger problem. And based on the scores here, it's gonna guide my evaluation and treatment as well.

'Cause if I'm seeing a larger score on hearing and sound tolerance and tinnitus, I'm gonna focus on that hearing portion. I've I'm seeing a larger score with the tinnitus portion, I'm gonna focus on that tinnitus. It's going to really drive my appointment. That being said, based on the scores on here, I tend to decide whether I should have one appointment or two appointments, because sometimes, trying to get everything done is really hard in one appointment. So I might take that initial appointment and really focus on the hearing aspect of the evaluation. And then have them come back for a deeper dive into their tinnitus. It's also what I'm using to start deciding if this is a patient who has tinnitus, or if this is a tinnitus patient.

So the patient who has tinnitus is not going to be as bothered by their tinnitus, they're just going to have the symptom of tinnitus, it's there, it might be a little bothersome, but that's not their biggest complaint. Whereas the tinnitus patient tends to have more severe tinnitus, it's a bother, and is going to need more counseling and more treatment guided towards the tinnitus. So let's say that I do end up breaking into two appointments. I've done the tinnitus and hearing survey in the first one. The next self-assessment measure that I really like is the Tinnitus Functional Index. So the Tinnitus Functional Index, it is what I consider the gold standard for self-assessments on tinnitus.

It's 25 questions and it gives you a lot of information. With the Tinnitus Functional Index, I would say you could have the patient fill this out in the waiting area. You could also send them home to fill this out so they could do this in a more comfortable area as well. And they're gonna answer 25 questions, and it's a scale of zero to 10, meaning extremely loud or all of the time versus none of the time, not bothersome. So they're gonna go ahead and fill this scale out, and then we're gonna get multiple different information from them. So with this, we're gonna get the quick score, so if we see a score of 14 or under, that means the tinnitus isn't really a problem.

If we see a score of around 18 to 31, we're seeing a small problem. By the time someone's in the 70s, they have a very big problem with their tinnitus. So this is going to also help me assess okay, how much do I need to spend, how much time do I need to spend counseling? What kind of treatment am I going to recommend for this patient? Because their scores have a wide range. I also use the Tinnitus Functional Index kind of as a subjective assessment as we go through tinnitus treatment as well. So with this, I have them fill it out in the beginning. Maybe half way through our treatment and then towards the end of the treatment to monitor the progression, 'cause I wanna see that score get to that range of zero to 17.

The Tinnitus Functional Index could even be further broken down into eight sub-scales. So these sub-scales are gonna be, how intrusive is the tinnitus? What kind of sense of control does the patient have over their tinnitus? Are their cognitive issues with the tinnitus? Is there sleep disturbance, auditory issues, relaxation issues, quality of life issues, or emotional distress? So I like being able to break this down because it's also going to help guide me through my evaluation as well as my treatment. Someone who has a larger sleep disturbance but doesn't feel that it's as intrusive, I may treat differently than someone who has reduced quality of life or emotional distress. It's gonna help me guide my referrals as well.

And this is important because remember earlier with that pie chart, I talked about the quality of life impacts due to tinnitus, and we see that it's broken down into these categories. So it really helps to figure out okay, so these are the quality of life impacts you're having, I can relate it to the Tinnitus Functional Index, it kind of gives us the bigger picture 'cause it can help us see okay, based on the score, this is what I'm seeing. Based on what the patient is saying, this is what I'm seeing. Are they both matching up? So it's just really reassuring, making sure that you're getting all the information that you need. The Tinnitus Functional Index had a cover story in 2014 with Audiology Today.

It's the first tinnitus questionnaire documented for responsiveness and has the potential to become the new standard for evaluating the effects of intervention for tinnitus with clinical patients and then research studies. What I also really like about the Tinnitus Functional Index is that it is available in many different languages. So if I have a patient come in and maybe English isn't their native language, I can try to find the Tinnitus Functional Index in their native language so it's easier for them to understand we're removing a language barrier quite possibly, and then I can take that score and compare it to the scores I would have in an English one 'cause they're gonna correlate. And it's the same question one in a different language.

So I'll be able to still get all that information without that language barrier. Now I would always recommend doing a self-assessment. Based on their scores, I might recommend a mental health self-assessment too. In the handout I've included a couple of extra slides showing some of these like the Beck Depression Survey and the General Anxiety Screener. This is really good because you'll know where the mental health of patient's going to be. However, that being said, if you are going to administer mental health questionnaires, you need to have a plan in place. This is something that's called gatekeeper training. With that gatekeeper training, what you need to do is you need to talk to mental health professionals.

Ask them to teach you how to administer these questionnaires. What kind of plan do you need based on the score? What kind of mental health referrals will you need and how do you recognize a mental health emergency? You wanna make sure you go through all of this before you're administering it, otherwise you're gonna administer it, you might see something alarming, and not know what to do. And that's not good for you or the patient. When we're talking about gatekeeper training, it's really focused on suicide prevention and suicide risk. I remember as a student I was in clinic, this was

probably my second year of grad school. I was working with my preceptor who specialized in tinnitus.

And we were at the hospital, he had to step away for a minute so I was with the patient. We were just chatting, and I was in a building in Chicago that had multiple stories and we were on the fifth floor, and there was these big glass windows you could look down on. And I remember she goes, you know my tinnitus is so bad and never stops. And she goes, sometimes I think it'd be so nice to just jump out this window. And it was very alarming to me because all of a sudden this patient is talking about hurting herself, and I as the student, didn't know what to do. So I went to my preceptor right away, told him what was said, he talked to the patient, and because he had this plan in place, he said okay, we're gonna walk you down to the emergency room to have them assess you and help you and make sure that you're not going to harm yourself or others.

So gatekeeper training, having a plan in place is important. And it is somewhat within our scope of practice to administer these mental health questionnaires, but in order to do so once again, please have a plan in place. So now we've done the subjective measurements in terms of what our patient feels their tinnitus is like. Now what we're gonna do is we're gonna go through the case history. And the case history, at that first appointment, I might not go into as much detail as I might in my second appointment. Based on my score, it's really gonna depend on what I do. But the one thing I always do is I ask why are you here? What brought you here?

Did someone refer you to me? Did you find my on Google? What is your referral, and as well as your perception of tinnitus. Okay, you have tinnitus, you've obviously looked into this, tell me what you have tried, what you have read, how you feel about it, I really wanna know how they perceive their tinnitus, their attitudes, their beliefs, what they've tried as well. And so then I'm also gonna ask them their medical history, audiological

history. I'm also going to ask what kind of support system do they have, are they going through this alone? Is there somebody who can help them? Are there people that they're talking to, are they part of a group? Because I want to know that, because if I make referrals to groups for them to get help or if they have someone who's going to go through this journey with them.

Now my basic case history is going to be just like with the hearing evaluation. But I'm gonna ask a couple of questions about the tinnitus. So can you describe the sounds for me? What does it sound like? When did the tinnitus start, was it gradual? It is associated with an event? Based on that, it may drive my treatment, it may drive my evaluation. If it's recent onset, if it's sudden, I know I'm sending them straight to their ear, nose, and throat doctor to have that checked out, because maybe we can reverse it. Was there a traumatic event that caused it, could we maybe get that mental health referral? I want all that information. I'm gonna ask them how often are you hearing the tinnitus?

Is it in one or both ears? So is it unilateral or bilateral tinnitus? How do you feel about your tinnitus? Someone says oh it's there, I can ignore it. I might not go into a tinnitus evaluation with that patient. But if someone is very bothered by it, I'm going to go into that evaluation. What impacts does the tinnitus have on your daily life? This is gonna be important not only for you to get a sense of how the tinnitus is impacting their quality of life, but also to create treatment goals. If it's keeping someone from sleeping through the night, then one of my goals is going to be sleeping large chunks of time at night or sleeping through the night eventually.

I'm also gonna ask them, have you worked or been around loud noises, like I would with an audiological evaluation as well. Because if they are exposed to loud noises, then I wanna have that hearing conservation talk with them as well to protect their hearing and keep their tinnitus from getting worse. I'm also going to ask them about

their medical and surgical history. Things I'm gonna ask them about is cardiovascular disease. Is there a restriction of blood flow in the blood vessels, is there heart disease, is there coronary artery disease, is their hypotension? Do they have any type of malformation of blood vessels? Reasons I'm asking these questions is because I'm kind of trying to find out what could be a potential cause for that tinnitus.

Cardiovascular disease is a known risk factor for tinnitus so it is important for me to go into detail about this. I'm also going to ask them about their medications. What type of medications are you taking? Are you on any salicylate analgesics such as Aspirin, because Aspirin does have a side effect of tinnitus. Are you on any antibiotics? Especially your mycins, those have a side effect of tinnitus. They're talking about recent onset tinnitus, maybe after they've had an infection. Maybe it's due to a mycin. Painkillers, cancer drugs like your platins, diuretics, cardiac medications, antimalarials. These are all associated with tinnitus, as well as some are associated with ototoxicity. So what I actually do with this is I have an Excel sheet with all the medications that are known to be ototoxic.

Well actually, I keep more than that. Common medications as well as all medications known to cause tinnitus or have a side-effect of tinnitus or are ototoxic. So as I'm going through the medication list, I'm in my Excel sheet looking these drugs up to see if any of them have a potential side effect of tinnitus. And if they do, I will let my patient know, okay, I know you're on these drugs, there is the potential side effect of tinnitus and that may be what you're experiencing, so go back to your referring doctor and let them know you're having this side effect and maybe they can change your prescription, maybe they can't. But at least we're well aware of what's going on.

Also in my medical and surgical history, I'm gonna ask about head and neck injury. Skull fractures, whiplash, blows, TMJ, jaw related problems are all risk factors for tinnitus as well as head and neck injury. These patients tend to come in sooner than

other tinnitus patients. And these head and neck injuries can cause tinnitus as well so I wanna know, what are the potential causes of tinnitus. So I'm asking all these questions. Now based on a patient's answers to these questions, based on those subjective measurements, those self-assessments, I might want to get into a more comprehensive case history. And I may not do this at that initial appointment, I may have them come back for a second appointment where I go into a more comprehensive case history.

Once again, I'm asking questions like who referred you, what research have you done regarding your tinnitus. Have you tried anything for tinnitus really? Has anything worked? What hasn't worked? How has tinnitus affected your sleep and concentration? How do you feel about your tinnitus, as well as how do you react with your tinnitus? Everyone reacts differently. Is it affecting your daily life? These are gonna be very specific to tinnitus, because they want to get their perceptions, their attitudes, their beliefs, what they've tried, what they haven't tried. If they've talked to someone about this. Maybe they're already seeing a therapist about their tinnitus and they're receiving cognitive behavioral therapy, which is great. But then I wanna make sure that I'm also reinforcing what they're already getting.

So now that I've gone through my case history and my self-assessments, we're really going to dig into the audiological assessment. And I broke this down into what you would typically do for your hearing test. You're gonna start off with an otoscopy, kind of go through all of these, maybe OAEs, maybe not. I'm not going to hit on every single one of these, because it may not be pertinent to their tinnitus. But the ones that are, I'm going to talk about. So otoscopy. Otoscopy is really important because we want to rule out that secondary tinnitus we talked about earlier. It could be that they have tinnitus because they have impacted cerumen. Maybe they have cerumen on their tympanic membrane.

We're using otoscopy to make sure everything is nice and clear. There are no secondary issues within that middle or external ear portion and the ear canal that could be causing tinnitus. We're also gonna go through tympanometry and reflexes. Tympanometry is gonna be great to rule out tinnitus to abnormal middle ear function or fluid behind the ear. So sometimes ear infections can cause tinnitus. We wanna make sure that once again we don't have secondary tinnitus. With acoustic reflexes, you should always do reflexes if you can. However, be very careful with a tinnitus patient or if a patient has decreased sound tolerance because it may exacerbate the tinnitus of the patient. So here we have a picture of reflexes and tymps.

Pure tone audiometry. Run through your pure tones. A lot of times, hearing loss is correlated with tinnitus. If they have hearing loss, they may have tinnitus. We know that research shows a patient with hearing loss is more likely to experience tinnitus than one who does not. Also, it's gonna give you more information. If they have one ear that they're reporting the tinnitus in, maybe you'll see on the audiogram that it's their worst ear, or maybe it's gonna give you information about the quality of the tinnitus. Because decreased hearing thresholds in those frequencies are correlated to the pitch of their tinnitus. It's going to help you guide treatment and counseling options. Now what about your patients where you have, you go through the audiological evaluation and everything is normal?

So you see an audiogram like this. Well for this patient I highly highly highly highly recommend high frequency audiometry and OAEs. A couple of different things that can be happening here. You can have normal hearing, but have a high frequency hearing loss that you wouldn't see with your typical pure tone evaluation. Also something else that may be going on that you wouldn't be able to see is this person is well within normal limits for hearing, however you don't know where their baseline is. Maybe they had super hearing and we're at negative 30 and all of a sudden it's zero. So that might

be their own hidden hearing loss as well. So with patients who have normal hearing, I always recommend OAEs in high frequency audiometry.

Because you can see something like this, where they're normal through eight and then they have a precipitous loss. With high frequency audiometry, make sure that you can calibrated with your system for high frequency audiometry as well as have a special set of headphones that are made for high frequency testing. Most inserts and headphones that you have in clinic with your audiometer aren't meant to go out to 16K. Now research has been done on high frequency audiometry and tinnitus and it's found to be beneficial for patients who are normal out to 8,000. Especially children, because sometimes children will have normal hearing, but then they have hearing loss out at 16K that could be causing their tinnitus. I would say for children as well as young adults, it should be standard practice in a tinnitus evaluation to go out as far as your audiometer will let you.

In many cases in research studies, you'll see patients with normal hearing through 8,000 who report tinnitus, and you'll see that high frequency drop, and it's correlated with that pitch quality and severity of their tinnitus as well. Someone may come in, normal hearing, very severe tinnitus, and you can't figure out why, if you go out to those high frequencies, you may see that major drop which would be causing their tinnitus. So I'm doing all of this during my initial appointment. Based on the hearing test results, based on what the patient is saying, I may have them come back for a second appointment. I try not to do everything in one appointment because it can be overwhelming. So I'll have them come back for a tinnitus evaluation.

A tinnitus evaluation, things I may do there is I will go through a comprehensive case history, the tinnitus functional index, but then I may do tests like tinnitus loudness and pitch matching, minimum masking level, and residual inhibition. So with tinnitus pitch and loudness matching, my goal is to find out what is the perceived quality of the

tinnitus. I also want to ask them questions, is it continuous, fluctuated, interrupted, what's its magnitude? So I'm gonna start off with pitch matching. Pitch matching is very easy to do. They're gonna start off by choosing your test ear and you're gonna determine the frequency of the tinnitus. So I'll always ask which ear do you hear the tinnitus more in, if it's equal, I select the better ear or whatever ear they think is the better ear.

What I'm gonna do is I'm gonna use pure tones as well as narrow band, and I'll go through my pure tones as well as narrow band and noise to see which one is most similar. I'm gonna do this at their most comfortable listening levels so that way they're comfortable, it's not too loud, it's not too soft. I'm also going to do a two alternative choice method where I may present 1,000 versus 2,000, ask which one it's more similar to, and keep going through. And based on that, I may fine tune it as well. Loudness matching, I'm gonna select a test ear. If both ears are the same, I'm gonna choose their better ear or what they perceive to be their better ear.

I'm gonna present the client with two intensity levels. So one's gonna be five dB lower than the other and say which one sounds closer to your tinnitus intensity level? And I'm gonna keep going up til we get close, then I may do one or two dB steps. Now as I'm going through this, I'm gathering information, I'm learning about the pitch, the loudness, 'cause it's going to help guide my treatment options. But this is also going to validate what the patient is feeling 'cause they're getting to express it more. In general, psychoacoustic measures aren't widely used in terms of treatment. But it is very reassuring for the patient, it's also great for you to know this information.

After I go through pitch and loudness masking, I may do minimum masking level, especially if I'm thinking of tinnitus with training therapy or tinnitus activities treatment, just to know what's going on. And minimum masking level is the lowest intensity level required to just cover or mask that tinnitus. So I want to be right at that level. So it's

kind of like loudness matching, but we're getting to the point where we're just going over it. Residual inhibition testing, it's not as commonly used as it should be. More and more research is done about residual inhibition testing, as well as residual inhibition therapy. So residual inhibition testing, is looking at the temporary suppression of tinnitus following the termination of some type of masking noise.

It's used in clinical evaluations, and it's based off of the neurophysiological model of tinnitus, which is saying that over-excitation of neurons is what's generating the tinnitus. So the way it works is you have the headphones on the ears, you put in a masker. It can be a pure tone, or a narrow band noise, for a couple of seconds, and then you stop it. And then you're going to hopefully see the patient perceive that their tinnitus goes away. You're gonna measure the amount of time it's gone for, and then that will be your residual inhibition. Some people may say it doesn't make it go away at all. Some people may say oh, it's gon away for a minute, some people may experience days, hours, it's really going to be different for each patient.

Like I said, some patients it may be longer than others. This eventually may be used towards residual inhibition therapy. Some therapies with residual inhibition are available right now, but they're not very well used. Another thing about residual inhibition before I forget is that with this, you don't want to do this right after acoustic reflexes or reflex decay, because you could get residual inhibition just from presenting those lab tones during those tests. Once I've gone through the evaluation, I'm gonna go into my counseling and treatment plans. So first thing I'm gonna do is I'm going to explain what tinnitus is and why it might be happening and talk about the different options for treatments, and I'm gonna create goals for treatment.

So counseling, I'm gonna break it into two categories, patient education and treatment options. Patient education, so what do I mean by that? I wanna give the patient basic information about tinnitus. I want to let them know that I understand that they're

experiencing tinnitus, and this is what tinnitus is, this is why it may happen. Research is being done, but there is a lot of different information coming in. I wanna reassure them, I'm reassuring them that yes, I understand they're experiencing this, even though it's technically all in their head. There's nothing to worry about in there. The tinnitus itself isn't dangerous. At this point, if I suspect another health issue, I may refer them at that point, but I wanna really make sure they know that it's okay that we're gonna work through this, more than likely it is not dangerous to them or their health.

Talk about any associations between tinnitus and risk factors. I'm gonna give them valid resource referrals too. So instead of having them go on Google and go down a rabbit hole, I'm gonna say okay, I know you're gonna want to do more research, so these are the websites I recommend because they're gonna have the best information, the most up to date information, and reliable information. And I may send them to the American Tinnitus Situation, the National Institute of Health, may send them to the Tinnitus First Aid Kit so they can get any information that's valid. And then I'm gonna talk about treatment options, as well as create goals. And I can promise you one of my goals is always gonna be lessen the impact of tinnitus on daily life.

I know I can't technically cure tinnitus, but I can definitely lesson the impact of tinnitus on daily life. So while we create our goals and go through our treatment options, I'm gonna break it into three categories. Provider driven tinnitus treatment, patient driven tinnitus treatment, and when I'm going to refer. And the whole point of our treatments is we have these gears and they should be connected, but negative thoughts affect your emotions which disrupt your lifestyle, which lead to more negative thoughts. So I wanna get rid of these negative thoughts of, how can I live with this? This noise is getting louder, nobody can help me. I wanna get rid of those. I wanna get rid of the emotional effects of tinnitus.

I don't want them to be angry, I don't want them to feel helpless, I don't want them to be frustrated, and I don't want it to disrupt their lifestyle. I don't want them to not enjoy life, I don't want them to avoid things that they used to do, I don't want them to have communication difficulties, I want them to get a good night's rest. I want them to have good relationships. So this is what we're trying to break, this gear, this vicious cycle. So provider driven treatments. Sound therapy. Sound therapy uses a process known as habituation to retrain the way the brain interprets tinnitus. Essentially it's teaching the brain to take that unwanted sound and reclassify it as something neutral or unimportant.

So it's kind of like the patient hears crickets chirping in their ears type of tinnitus, and usually with crickets, they may hear it when they go camping or outside. What we want to do is have it associated to not be important. Because what's happening with this is the brain is getting confused about where the sound is coming from, it's bothering them, it's becoming your biggest focus. So sound therapy, major goal, forget that the sound exists. So some therapy actions, in terms of the sound itself, you have four different types. You can use masking sounds, distraction sounds, habituation, and neuromodulation. So here's a masking sound. So we've all heard this sound before. So masking is exposing the patient to an external noise that's loud enough in volume to partially or completely cover the sound of their tinnitus.

You have this distraction sound therapy option, so this is gonna be something that's gonna divert the patient's attention from the sound of tinnitus. So a rainfall would be. Oops. Habituation is going to just be using sounds or teaching your brain not to focus in on that sound, make it neutral or away. Then you have neuromodulation, which is a specialized sound to minimize the neural hyperactivity that could be the cause of tinnitus. Neuromodulation is gonna be very patient specific. It sounds very interesting, so I'm gonna play you a clip so you can know what the patient is hearing. But what it's doing is it's activating different parts of the brain, so let's take a quick listen to that.

So with sound therapy devices, you have sound masking devices, you have hearing aids, modified sound, notched music devices, sound and sleep apps. Those are all gonna go back to your sound therapy options, they're gonna have those in there. Sound masking devices, there are many different types of sound masking devices. If you do a quick Google search, you're gonna see many different ads, you're gonna also see different price ranges. You'll find things for 20 bucks all the way to 1,000 dollars for sound masking devices. Sound masking devices will have a variety of different noises that a patient can hear. So it could be white noise, pink noise, nature sounds, ambient or subtle sounds, so you might hear the water fall, a fireplace, thunder, birds, fans.

Traditionally, it's a table based device that you just sit on the table and turn on. But there are pillows that patients like or headphones, so your patients who need it to fall asleep may prefer the pillow, because then they don't have anything in their ear and they're not interrupting their partner in bed. Hearing technology can also help with tinnitus. So sometimes patients have hearing loss that's associated with their tinnitus. And by amplification alone it gives them enough ambient noise from the world to reduce their tinnitus. Also, many hearing aids are considered combination devices. Combination devices give amplification, but they also have the sound or sound therapy device built in. And so for example, Starkey has tinnitus features, it has white noise, and we have it so it's completely adjustable so you can have a custom audiogram shape based on your tone averages.

This is really great to have a combination device, almost every manufacturer has one. Because it's portable, it's something that the patient can use throughout the day as needed. There's also notched music sound devices. This is using the theory of notching, which means that you're giving white noise in all areas except where they're perceiving their tinnitus. So this is going back to your tinnitus evaluation where you looked at okay, what is the pitch of the tinnitus and what is the loudness? You're

creating a notch in that area because what notched therapy is thinking is that the activity of the auditory neurons that underlie the tinnitus area can be suppressed through neuroplastic changes in the brain. So by creating this fully masked noise, you're inhibiting that tinnitus.

You're suppressing the tinnitus, and this is what notched music sound devices sound like. It sounds very normal, you don't really hear that notch. Other things that you have are sound and sleep apps. So you have Headspace, Noisli, Pzizz, Slumber, Sleep Orbit, White Noise and Company. They can use these to help them relax. White Noise is also known as My Noise, it's one of my favorites because there's statements in there. I want it to sound like a medieval garden is outside my bedroom, and then they can play that sound. Most of these apps are free. Headspace, Slumber, Sleep Orbit are gonna use meditation to help the patient relax and go to sleep. Pzizz, Noisli have programs that are made with different sounds mixed together to help the brain go into a deep sleep.

Manufacturers also have options for you as well. Starkey has Relax. It's a free app, there's 12 different stimuli options, you can change the rate of fluctuation, put it on a sleep timer as well. You have tinnitus protocols. You can Google these, Tinnitus Retraining Therapy, that is a class you can take. It takes about 12 to 24 months for a patient to go through this. It's using cognitive based therapy as well as sound therapy to help the patient with Progressive Tinnitus Management, which is gonna categorize the patient and then give him different objectives and then the Tinnitus Activities Treatment. Patient driven options are going to help them get that attentional focus away from their tinnitus. So I have a quick video on what we're trying to do that's from Headspace that I'd like to show you.

- [Narrator] Training the mind is often quite different to how people imagine it to be. Maybe they have an idea it's about stopping thoughts or eliminating feelings. But the reality is a bit different. An easy way to think of it is to imagine yourself sitting on the side of a busy road, the passing cars representing thoughts and feelings. All you have to do is to sit there and watch the cars. It sounds easy, right? But what usually happens is that we feel a bit unsettled by the movement of the traffic. And so we move out into the road and try and stop the cars, or maybe even chase after a few, forgetting that the idea is to just sit here.

And of course all of this running around only adds to the feeling of restlessness in the mind. So training the mind is about changing our relationship with the passing thoughts and feelings. Learning how to feel them with a little more perspective. And when we do this, we naturally find the place of calm. Will we sometimes forget the idea of the exercise and become distracted? Of course we will. But as soon as we remember, here we are, back on the side of the road again, just watching the traffic go by, perfectly at ease in both body and mind.

- So this is the goal of most of our patient driven tinnitus treatments. Mindfulness is the big one, there's many apps out there. It's being aware of where we are, what we're doing, not reacting or getting overwhelmed. Patients can also make lifestyle changes. Getting more sleep, which I know is hard for some tinnitus patients, will help relieve their tinnitus symptoms. Quitting smoking, diet changes, relaxation, yoga, exercise, acupuncture. So in terms of diet, these are all known triggers, caffeine, salt, alcohol, saturated fats. A lot of these will induce stress responses which will aggravate the tinnitus. It can also cause hypertension, which is a risk factor tinnitus, things like that. But then we also know there are foods that can help, foods high in zinc, potassium, vitamin B12, bromelain, and folate are good.

So your leafy greens, your bananas, your tropical fruits like kiwis and pineapples. Your fish, your chicken, are all good diet changes to help with tinnitus. Yoga is also effective. They've done studies where they've looked at patients with tinnitus and had them take a questionnaire, pre and then three months after, utilizing yoga every day, and they found that most patients, the severity of their tinnitus is greatly reduced. So besides patient one, you can really see the dramatic difference in these patients, just by using yoga. 'Cause it brings that mindfulness factor, it teaches you how to breathe, it's overall wellbeing. And same thing with exercise. Exercise is important, because with exercise, it's going to help you feel better, it's gonna help you cope with your tinnitus better 'cause you're overall feeling better.

Acupuncture, there is quite a bit of information on acupuncture for tinnitus helping. It's a hit or miss. Some patients love it, some patients don't. A randomized study showed that the tinnitus severity of patients receiving acupuncture over time decreased compared to someone not receiving any treatment at all. There are support groups, in person and in virtual, that your patients can go to. Virtual is great for people who are rural, especially in today's times to use. And then of course there's referrals, and these are gonna be mental health referrals. I have all these information in the slides for you. Cognitive behavioral therapy. They can go to a mental health provider, but there are also apps that walk them through cognitive behavioral therapy, such as Sanvello that they can use, it's gonna teach them cognitive skills, mindfulness skills, self guided, sound enrichment, behavioral skills.

Cochrane reviews of cognitive behavioral therapy for tinnitus shows there's a significant improvement in the quality of life, a positive effect of the way in which people cope with tinnitus. So remember, your meta-analyses are the best type of research. And they're showing that cognitive behavioral therapy is great for tinnitus patients. There's also acceptance and commitment therapy. It's basically using acceptance and mindfulness to accept the tinnitus and then redirecting their focus on

doing things that are gonna help their life be better, worth living. With acceptance and commitment therapy, they do need a mental health provider to walk through it. They did find that patients who went through acceptance commitment therapy had better outcomes in terms of tinnitus then those just with tinnitus retraining therapy.

Now remember tinnitus probably will never go away for these patients, but we wanna take that focus away from that single light in a dark room. We want the tinnitus to blend into the room, so it's just a part of it, still there, but it isn't bothersome, that light isn't shining as bright. I have some resources here for more information, these are great. I really like the American Tinnitus Association, the National Center for Rehabilitative Auditory Research will walk you through that Progressive Tinnitus Management as it was first made for veterans who came back for war. Use these resources, they're great, I wanna thank you for your time. I'm sorry I didn't have time to go through all the questions but I hope you have a great rest of your day and I hope you learn something new today. Thank you.