Tinnitus Activities Treatment

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- [Presenter] At this time, it is my pleasure to introduce Dr. Rich Tyler, who will be presenting Tinnitus Activities Treatment. Dr. Tyler was trained as a clinical audiologist at the University of Western Ontario, and then completed a PhD in psychoacoustics at the University of Iowa. He worked initially at the Institute of Hearing Research in the UK and is currently professor in both the Department of Otolaryngology, Head of Neck Surgery, and the Department of Communication Sciences and Disorders at the University of Iowa. His scientific work includes quantification of tinnitus, as well as the investigation of different treatments. Dr. Tyler sees patients weekly in tinnitus and hosts an annual tinnitus and hyperacusis treatment workshop every June. Dr. Tyler has served on committees for the National Science Foundation, The World Health Organization, and the American Academy of Otolaryngology as well as the VA. Thank you so much, Dr. Tyler, for being with us today, and at this time, I hand the mic over to you.

- [Richard] Okay, thank you. I'm just so pleased that everybody is interested in tinnitus. This is a wonderful opportunity to help our tinnitus patients, and I'm glad you're interested. Good for you and good for the patients. So, this is a general overview of something we eventually called tinnitus activities treatment. And it's called activities because the patient is given activities to do on a regular basis in a cooperative situation. And I'm gonna go over the general background for the strategies to give you an idea, and also mention that the actual, some of the slides that we use I'm gonna share with you today, but there's also some I could not share given the time constraints, and they are on our University of Iowa Hospital website, you can just search for that on the internet, University of Iowa Tinnitus Clinic, and you'll have access to all the slides which are easily downloadable at no charge at all. So, we are hopefully going to see how to evaluate the consequences of these tinnitus patients and make some measurements. We're gonna focus primarily on counseling and how these difficulties arise in different patients on thoughts and emotions, hearing, sleep, and concentration. And in addition to that, we can focus on the provision of hearing aids to help these tinnitus patients, and also many of them will require some sound therapy,

and that's, again, a good benefit for them, and a good opportunity for you to provide some help with hearing aids and sound therapy devices. So, I'm gonna start off on just by giving you a broad overview of what's available in this strategy. So we focus on what we consider the four primary areas that are affected by an individual, and these are different in different patients. So almost every patient we see in the clinic for counseling has problems with thoughts and emotions and has problems with hearing. A lot of the patients complain about sleep problems, but not all of them, and a lot of the patients complain about concentration problems, but not all of them. So the actual strategy for these counseling procedures is based on their individual challenges. So again, we almost always focus on thoughts and emotions, we almost always focus on hearing, and if sleep and concentration are needed, they are added in. So typically what happens generally is that we go through an evaluation, we may or may not actually measure the pitch and the loudness and the masking ability. We will offer a questionnaire if they appear like they're stressed out, and I'll talk more about that. But what happens is they would sign up for, in that preliminary session, we would go over what the options are for our treatment schedule. And then we would actually use the patient's responses to the questionnaires to decide what would be the next step. And from that initial evaluation, we would schedule usually about a one hour session on thoughts and emotions. In that session, they would get with practice in the clinic, they would go home for a week or two weeks depending upon travel issues, they'd come back two weeks later, we'd go over their homework, and then we'd practice some issues with hearing.

And we'd go over some issues in the clinic, assign some homework, and they would go home and practice those. And then if they had sleep problems, we do the same thing a month later, if they had concentration problems, they go through the same issues, they come back a month later. So it's focused on individual needs, we have to pay attention to that. And when they come in, we offer one of these topics in each of the counseling sessions. We sometimes also do a group session initially to try and encourage people to join in with the individual sessions, but we're focusing here on the

individual sessions. And these are gonna be one session for approximately an hour counseling session. And again, there's homework activities practiced, they're assigned, and then when they come back, they're reviewed the next week. So, this is the introductory session where we would go over and show what options there are and where we wanna start with these patients. So we ask the patients, "Where do you wanna start?" Sometimes we think as clinicians, we know all the answers and we've got it figured out what they need and exactly what we're gonna do, and they're just gonna be sitting there listening. It turns out that it's actually quite helpful to understand where the patient's at and what they want and what's happening in their life. Everybody's different, and they might be there to visit you for some other reason, they might have something else going on that's even more important for them than their tinnitus. So we just keep an open ear and listen to what's important for them. Where do you wanna start? What do you think caused your tinnitus?

So a lot of them, of course, are caused by noise exposure, a lot of them are simply unknown, and again, the idea is to give them a chance to share what they think is the issue and what's relevant for their tinnitus. We wanna know what their life was like when their tinnitus began. Again, people can be very stressed out in different situations, we don't always appreciate all the challenges in life, at work, at home, and give the patient an opportunity to talk and share about their own individual experiences in life. Specifically, then, how has tinnitus influenced your life? And again, pause, give the patient a chance to talk and think about things and provide some insights into what direction the therapy might go. How do you think we might be able to help you? Well, I don't have any magic pill either. Most of them want a magic pill. But the question really is, how can we help you? And what do they expect of us? So, some people actually come into the clinic with a long list of things they've actually tried. There's a lot of stuff on the internet, some of it's useful, most of it's not helpful, and a lot of patients come in with a long list of drugs, dietary supplements they've already tried. So I wanna know what they expect of me. And, again, just give them a chance to talk and see where they're coming from and what might be able to help and how we might be able to

move forward on this. So, we try and categorize these patients in the very first session. This might take two sessions, but we wanna know if they're curious, they just wanna know, I've got this ringing, what does it mean? I've had it for 10 years, doesn't bother me, but is there anything that can be done? And just a simple answer can be helpful for those patients. There are other patients that are concerned, having trouble sleeping at night and what can be done, and I've been on the internet and thought about this. And for those patients, we have a brochure we give them. Let them know that we're here and that we have counseling, that hearing aids and sound therapy can work for some of these patients if they need them. And they're just sort of often here for their hearing evaluation or for hearing aids, but they also have tinnitus and they wanna know what there is that can be done. The third category of patients are distressed, and those are the ones that we see most of the time in our tinnitus clinic. So these are the patients that need our help. These are the patients that are very bothered. They have some real issues about worrying not just about sleep, but also, is this gonna get worse, am I stuck with this for life? Is there a pill? And these patients need our help.

At this point, we often use questionnaires, and we have two questionnaires that we use for these distressed patients. And one of them is simply we refer to as an open ended questionnaire. Please make a list of all the problems that you have as a result of your tinnitus. And this actually gives the patients a chance, again, to write down what's important for them. Again, we might have a very clever questionnaire that's been standardized, but we actually wanna know where they're at. And this open ended questionnaire gives them an opportunity to list and focus on what's important for them. So that's a really good starting place. We also have published a tinnitus primary functions questionnaire, which again, is available on our website and has also been translated into several languages, and is used worldwide. The Tinnitus Primary Function Questionnaire, and that functions on those four different categories, thoughts and emotions, hearing, sleep, and concentration. Okay, so this is the initial stage of getting the patient connected. So the next stage is the four different counseling sessions that I'm going to go over, and there's anywhere between 30 and 60 images

that are associated with each of these four different counseling sessions. And again, due to time, I'm only gonna show you a few from each of the different counseling sessions. But it should give you a good picture of what the options are and the way we proceed in trying to capture the main issues. So again, you won't see all the slides from thoughts and emotions, but you'll see most of them, and you'll get an idea of what the strategy is. So, each one of these is done in one session. So the first session is thoughts and emotions. So, we are going to talk about the way that tinnitus can have an impact on you, but also hearing and hearing loss and how important hearing is. We're gonna talk about the tension and how that can affect your emotions and the kind of behavioral strategies that you use to deal with that. And hopefully, we're gonna discuss some ways that you can use to change your reactions to your tinnitus. It's our job to be helpful here, and we want to share some strategies that we have used successfully with lots of people to help you decide how you can change your reactions.

So, hearing is very, very important. It's not just about hearing, it's about communicating, interacting with people, socializing, looking forward to the future, hearing is really, really important. And tinnitus can also interfere with your hearing, it can mask some sounds and make it more difficult. And we would like to discuss here some things and practice some things here how you can change your listening strategies so that you can hear better. The other thing we do is sleep. And so sleep is something that is important for all of us, and there's a lot of variations in normal sleeping patterns, and tinnitus can interfere with sleep. So we'll have a session on sleep as well and go over some activities to facilitate sleep. And in particular, what happens when you wake up at night and you're there alone with your tinnitus. And the fourth area that we use is concentration. So, lots of different things affect our concentration, and this is normal. Tinnitus can also affect your concentration. And so here we're going to discuss different strategies that you can use, things you can do to improve your concentration issues. Okay, so we're going to include sessions that are relevant for you. You'll be reviewing the materials before we leave and discuss, we're gonna answer all your questions, we'll practice some of the activities you'll be required

to do at home, and then be clear and give you some homework to do for each of these sessions. So that's the overall plan that we're gonna use with this tinnitus activities treatment. So, the first session is specifically on thoughts and emotions, and this is an example of some of the slides that are available for thoughts and emotions. So, the overall plan in the thoughts and emotions strategy, we're gonna talk about hearing and hearing loss. We're gonna talk about tinnitus. We're gonna focus on attention, behavior, and emotions, and how they can interact. We're gonna discuss ways that you can change your reactions to your tinnitus and how we can be helpful. And then before we finish today's session, we will do some practicing of some activities that we would like you to challenge your usual day to day function at home and see if you can improve your hearing and communication. So we'll practice those before you go home for your homework.

So, part one of this session is we're talking about hearing and hearing loss, including how we hear and what causes hearing loss. So of course, we'd like to hope that our patients have already gone through some of this before when they've seen an audiologist in the past, but not always, but it's good to review some of these things anyways. So the important thing about this strategy is to show the transition from sound through the ear canal, through the eardrum, the bones in the middle ear cavity, and then affecting the cochlea. And information being sent from the traveling wave and hair cells, information up to the brain. And so it's also important to talk about middle ear, and we refer to tinnitus that starts in the middle ear as middle ear tinnitus, as we do for hearing loss. So middle ear tinnitus is pretty rare and we don't see that very often. It's usually with a blood vessel pulsing or a muscle twitching. Some of the patients occasionally will have this and we'll sometimes have to go back and go over this middle ear mechanism. But most of our effort will be talking about the cochlea and the hair cells and the nerve fibers and the excitation in the nerve fibers in the inner ear. So, I've missed out a few slides here, but we ended up with the patient's talking about the hair cell. And then we talk about the activity on these nerve fibers. And the way that I talk about this with patients usually is I say it's like a flashlight clicking on and off, and

the activity is like being carried down electrical wire up to your brain. And this is how the brain knows that there's activity, that there's sound being processed in the external ear and in the middle ear and in the inner ear, and then that's transformed from the hair cells, and the activity then is transmitted with these electrical impulses all the way up to the brain. So, the next point that I make is that, in fact, there's 20 or 30,000 of these nerve fibers going up to your brain, and these nerve fibers actually have spontaneous activity on them. And your brain, actually, everybody's brain, has all this spontaneous activity going on from different nerve fibers. And the brain actually is used to this spontaneous activity, and the brain hears silence in response to this. So there's no sound, there's activity, and you hear silence. When somebody says a word like table, lots of different nerve fibers are active in very specific ways, and the brain interprets this activity on all these nerve fibers as the word table. If it's a cricket sound, there's a different kind of activity, and the brain has learned that the activity represented on that series of nerve fibers and that pattern of activity is a cricket sound. So, the brain's functioning on all this stuff.

So, let's go on now to hearing loss. Well, lots of different causes of hearing loss. And again, a lot of them are simply unknown. But we want the patient to appreciate that there's many different causes and focus on what's important for them. But also appreciate that a lot of the situations are unknown. And that's okay. We then go back to the issues eventually on nervous activity, and we talk about how that nervous activity is part of the normal hearing system, lots of activity sent to the brain. When you have a hearing loss, it turns out that you lose a lot of these nerve fibers, and on some of the nerve fibers in the auditory system, there's actually less activity. So the brain is not getting as much activity as it used to in terms of nerve fibers and activity on the nerve fibers, at least in some forms of hearing loss. There is no cure for sensory neural tinnitus, I'm sorry, sensory neural hearing loss. There is no hair cells that can be replaced. However, hearing aids can help, hearing aids are a wonderful thing. Great technology these days, lots of opportunities to increase the loudness of sounds to make things easier to understand. They don't restore hearing to normal, but they can

have a amazing, wonderful impact on helping you hear better. So, the patient will have been encouraged to bring in their audiogram if that's been done. We can also, of course, do the audiogram in the clinic. And we go over their audiogram again, talking about normal hearing for 19 year olds, zero dB HL on average. So some people had hearing when they were 19 at minus 15, and some had it at plus 15 dB HL when they were 19 years old, that normal distribution. So it's often helpful to point out to the patient that they have a hearing loss, even if their threshold might be 10 dB HL, that might mean they have a hearing loss relative to when they were 19 years old. In any event, it's sometimes helpful for some patients to show them that very concrete way that their auditory system is not what it used to be, and the audiogram can be a useful place to start to accomplish that. So then we wanna know about their hearing, what are their perspectives? Do you think you have difficulty hearing? Have you done anything to try and change that? There's some situations that are more difficult than others.

So again, we wanna interact with the patient, give them an opportunity to talk and let them let us know what's important for them in terms of their hearing ability. So, we then move down eventually to tinnitus, talking about it, it's a sound in your ears or in your head, and it's heard differently by different people. And it turns out that it actually almost always occurs with a hearing loss, and might depend on how you define hearing loss, but the tinnitus is something separate. The way that we think about it, you have activity on nerve fibers that's not supposed to be there. So it's not gonna damage your hearing, and your hearing, all of us are gonna lose our hearing, everybody is losing our hearing as part of the natural aging process. And that's a separate entity from the tinnitus. So again, what do you think caused your tinnitus? So we give them a chance to talk about the issues that are relevant here. We point out how common it is. Probably 15% of the population have tinnitus, and maybe 30% of the population over the age of 60 have tinnitus. So I often tell them that they probably know people that have tinnitus, but they don't know they have tinnitus because it's invisible. I sometimes say how easy it is to appreciate somebody who's disabled because they can't walk

and they're in a wheelchair, but it's not easy to appreciate somebody who has a hearing loss. Although talking to them, we can figure out the challenges or we can put earplugs in and get a simulation of some aspects of hearing loss. But tinnitus is really hard to appreciate what the problems are. So we don't know how many of our friends actually have tinnitus. Currently, there are no drugs or surgery that can reliably eliminate tinnitus. And I pause and I say that twice. Currently, there is no experimental evidence suggesting that any medication or dietary supplement can reduce or eliminate your tinnitus. Nothing has been replicated, nothing has been formally acknowledged as a cure for tinnitus. However, there are some things that you can do to change your reactions and how it affects you. And there are things that we can do to help you, it's our job here to be helpful. So we go through the auditory system again, and again, the brain receives auditory information in the auditory cortex and the temporal lobe. And when there is a sound produced, then there's activity. And when there's a sound that is your tinnitus, that also has to have some activity in the auditory cortex. And your brain is interpreting that as a ringing sound or whatever sound it is for you.

We go back to this normal hearing, very spontaneous activity, the brain hears silence. Hearing loss, you lose some nerve fibers, some of the nerve fibers are missing and you don't hear anything. If you have tinnitus, on some of the nerve fibers, your activity is actually increased. There's several dozen different theories now about tinnitus, but nobody really knows for sure. But it is true that it's likely somewhere in the auditory system relates to an increase in spontaneous activity. And this is really helpful for a lot of patients, because now, for the first time, they can see that there's something real. A lot of patients are really grateful that they're not making this up, it's not part of their imagination, they don't have a mental illness. Their brain is interpreting this activity as a sound. So that's a very helpful point for lots of patients. What does your tinnitus sound like? Again, a different activity on your nerve fibers is gonna result in a different sound. And so showing the options that the patients have just can show that there's some activity corresponding to whatever sound that they hear as their tinnitus. So, part three

of this first session is on attention and how things can capture our attention and how our emotions are influenced by that. So for example, different things grab our attention, touch, smell, taste, sounds, and vision. So there's all stuff going on all the time that competes for our attention. And we can actually often consciously focus on one thing and ignore the other things. Even though subconsciously, things like the smell and background sound in the room and visual things off to the side are present, we can ignore those. But an important thing, like if a police car drives by right now, that will grab your attention. And again, that's normal. So that's your conscious attention, you'll be thinking about that. All the rest of this stuff will still be going on in the background, but that police car will grab your attention. So lots of things, not just a police car, but something unusual, something scary, something unexpected, is gonna capture our attention. We can decide to pay attention and change our focus for a lot of things, if the police car is not an issue, it's gone, it's driving past. But it's also possible that we can do something and maybe call a friend and, you know, "Is the police car going to your house?" Or if the police car parks down the bottom of our apartment building, then what's going on here, is there something I need to be worried about? So we go through different ways about how attention can have an effect and how that depends on the issues and what we can do.

Tinnitus does not make you deaf, it doesn't mean you have a mental illness, and it doesn't lead to senility. So if you're worried about this, the more you think about your tinnitus, the more you're thinking about your tinnitus. So at this point, we have to sort of help them move away, and part of that is by the activities that we do. So again, I'm just giving you some examples here of these activities, describe an image you like and an image you don't like. Describe a sound you like and one you don't like. And describe your tinnitus. So, part four of this first session is changing the reactions you have to your tinnitus. So, the relationship between thoughts and emotions, and this is sort of a background of cognitive behavior therapy. So, you can interpret something as being neutral, you can interpret something as being negative or being positive, and that has an impact on your emotions. And this is the example I like to give here. So, the

doorbell rings, it's a doorbell, it's not good or bad. The doorbell rings two weeks later and there's a fire next door. The next day, the doorbell rings and there's a car accident outside your house. The next day, the doorbell rings and your tree has fallen on a neighbor's lot. Two weeks go by, the doorbell rings, someone sends you flowers. The next day, the doorbell rings and a friend arrives. The next day, the doorbell rings and someone has sent you a gift. It's all the same sound. It's not a good sound or a bad sound, it's a sound. But your experiences and interpretations of those sounds is gonna affect your emotional reactions to this. So that's an example of how we use cognitive behavior therapy. What kinds of thoughts have you about your tinnitus? Are there situations where it's really bothersome? What do you think about your tinnitus? So, how can you change your reactions, and how can we help? So, changing the importance, changing the important emotional reactions. Refocusing on other activities. Reducing the contrast between background sounds and your tinnitus. So you can change your interpretation of the importance by appreciating that tinnitus is simply a result of this increased spontaneous activities. Also, lots of people have this, you're not alone. It's an activity on your hearing nerve, it's not threatening your life or your health.

So the tinnitus and your reactions to the tinnitus are actually two different things. So, negative reactions have negative thoughts. If you can reduce those and think about the different anxiety and irritations, eventually, if you come up with some constructive thoughts about it, the idea is eventually you'll have your tinnitus but you don't have to have a prominent reaction to it, it's just in the background, it's a sound, it's not a good sound or a bad sound. And part of that can be accomplished by refocusing on other activities. So, what hobbies do you have? There are some activities that when being active, that you don't notice your tinnitus. Some people say, for example, when they're out bicycle riding, they don't notice their tinnitus as much. Are there any new activities that you think you might be able to participate in that might help you reduce your attention to your tinnitus? So we then focus on background sounds. So again, using the analogy with the activity on the nerve for tinnitus, the activity on a nerve for low

level sounds, if you play the low level sound with your tinnitus, that periodic or that tinnitus is not as prominent. And we use here the analogy of a candle. So a candle in a dark room, your tinnitus is sticking out, you open up the window behind the candle and the candle's the same, but it does not stand out in the same light. So this is a introduction to potential sound therapy. Dogs barking, it's not your dog, you don't like dogs. You play a fan in the background, you get yourself busy and working on something else. And eventually, both the fan and the dog sort of fade into the background. So, background sounds and keeping yourself focused on activities can help. Lots of different ways of adding background sounds including relaxation CDs and nature sounds, music in the background, lots of options we have now. Do any of the background sounds actually make your tinnitus less prominent? And of course, a lot of patients will come in with some sounds, although it's also helpful as a homework assignment. So, this is the homework assignment now for this first session. Practice focusing your sessions on tinnitus and then do something else. So identify alternative activities that you might enjoy, and try some different low level background sounds.

See what happens with that. Write down your thoughts and worries about tinnitus. Keep a diary. And then see what actually happens in real life and what can change, and if you can do things that make your tinnitus less important. And try some of these activities, write them down. When you come back next week or next month, we'll talk more about this. List things that reduce your tinnitus, list things that worsen it. Some activities you enjoy, some sounds you enjoy listening. So again, the overall plan here is instead of their being overwhelmed and doing nothing and to have some things they can try in a positive way. And here's an example of the diary that is available to them that they're asked to do when they go home after that first session. Okay, the second section is on hearing and communication. So they would have come back after a month away approximately, and now we're gonna go over the goals. We're gonna talk about hearing and communication factors, how tinnitus can affect hearing, how you can improve your hearing, and some activities for homework. Reduce the communication difficulties, what difficulties do you have with your hearing loss? What

difficulties you have with your tinnitus and how you can reduce the stress associated with communicating. So we will go over their audiogram once again and talk about how their audiogram can affect what they hear specifically, again, hopefully they've had some of this already. This is not too different from what you might provide in a general aural rehabilitation program. I say this is noise induced hearing loss from somebody who's been working in a factory for 30 years. But this also might be a noise induced hearing loss for somebody who's been working in a factory for only five years. So, lots of things actually affect our communication, not just our hearing ability, but background noise, ability to see the talker, familiarity with the talker, with the topic of discussion, and the stress level we're under. So all these things are relevant for communication. We'll go over the audiogram again and their hearing abilities, and go over the different intensities of different sounds and how that affects what they would be able to hear and not hear. We talk about background noise and background noise is such a problem. And some things that they can do, if possible, to move away from the background noise or to reposition yourself in a communication situation. And we can practice that in the clinic.

We also focus on the ability to see the talker and how important that is, and how they can move around. And again, we practice these things. And then what do you find difficulty, have you tried anything to improve situations, any things unsuccessful or successful? So we practice this in the clinic before they go on. Tinnitus can also affect your hearing. Tinnitus can make sounds harder to hear, you have to hear over them, or the tinnitus can mask some sounds. So it can be a real problem for a lot of patients for their hearing. Well, lots of things can be done, amplification, reducing background noise, watching faces, using repair strategies, and using an effective communication style. I won't go over all of these here, but you're probably aware of most of these strategies anyways. We go through these things and practice in the clinic. Hearing aids help you hear better, interact with people, localize sounds. And some of the patients, I'm gonna say maybe a third of the patients coming through our clinic will already have hearing aids. Some of them have tried them and given them back, some of them don't

wear them, but two thirds have not, and they can all benefit from hearing aids. Watching faces is important, positioning is important. Interacting with the talker, asking the talker to slow down and make sure that they can see their face. There'll be activities they have to go home with in terms of moving around, changing the light, and using repair strategies. The next session is on sleep. So here's a subset of the sleep things that we go through. So we will talk about their normal sleep patterns, we'll talk about things that affect sleep, daytime activities, evening activities, preparing for sleep, waking up at night, in the morning. And they'll have some things they're gonna practice when they go home. And again, I'm just showing you a subset of these that are available from our department website to give you a general feel for that strategy. So the normal sleep patterns, the amount of sleep actually varies substantially from one person to the other. And for lots of us, you know, I wake up once or twice a night usually. And tinnitus doesn't usually wake people up in my experience, but when they do wake up in the middle of the night, their room is quiet, and that's a real bad time for a lot of these patients. If we're stressed out or there's noise or light, temperature, work schedules, jet lag, all these things can affect our sleep, and that's reasonable that they do affect our sleep. Also, of course, coffee, medications, alcohol and nicotine and tinnitus can affect your sleep as well.

Some daytime activities, avoid napping, get regular exercise at least three to four hours before going to sleep. And even if you're tired, just go for it, just do the best you can function, and when it's bedtime, head for bed. It's good to have a regular schedule, and slow down before you're ready to go to sleep. Don't exercise or eat or drink caffeine, keep things simple before bedtime. Listen to low level background sound. A lot of patients use these in their bedroom. With the fan, they don't have control of the level easily, so there's a lot of apps they can use and things that they can put in their bedroom to help them with their sleep. Everybody's different in terms of what sound they prefer. So you can use soft sounds, but everybody's different, so lots of different options of sounds that people can easily ignore and feel comfortable with. It's also possible to put a speaker under the pillow. And some options, we usually don't

recommend that people have a timer, 'cause sometimes when the sound goes off in the middle of the night, that you can wake up. But you can find different things work, lots of different options available now to have a sound while you're sleeping. Relaxation exercises are really important. So we actually do these in the clinic with the patients just for their emotional stability also, and different activities we talked about already. Including progressive muscle relaxation, visual imagery, mindfulness meditation. So with progressive muscle relaxation, they are gonna systematically tense and relax groups of muscles. And these are things we can all do, it's pretty straightforward. Tensing a muscle and then gradually relaxing it, relaxing it. The easy one is all of you can hold out your arm, clench your fist for a minute and hold it for a few seconds, and then gradually, gradually, gradually release that and release that. And while you're doing that, you're not thinking about your tinnitus, and you're relaxing and focusing on something else. Visual imagery we also use, we have them close their eyes and think about you're on a beach in Jamaica, and you can hear the waves, smell the water, life is good. And then when you're imagining that, you're visually imagining being on that beach, you're not thinking about your tinnitus.

So everybody's different, there's no magic wand here, but it's good to sort of appreciate what the different options are. So the activities they're gonna go home with are keeping track of things that you think it affects your sleep, and see if you can change your bedroom, place for sleeping. And again, I'm not showing you all the slides. And we have a sleep diary that we give some patients to use as well. So the last session is on concentration. And again, not everybody has problems with concentrating because of their tinnitus. But this is important for some, and tinnitus can be very distracting and it can affect their work. So, how things affect concentration and how tinnitus can affect your concentration, and strategies you can do to improve your concentration. Well, anything in the environment that is distracting, including noise and temperature and lighting issues can affect our concentration. What problems do you have with your concentration? And how do you feel about this? How has it affected your life? Well, it's reasonable that tinnitus can affect your concentration. Usually we're

focused on one thing, but if there's something going on in the background like our tinnitus, it makes it harder to concentrate on other things. And this is, again, normal. So to improve your concentration, if tinnitus fades into the background, it's not that important. Eliminate distractions, stay focused. There's some things you can do to decrease the prominence of your tinnitus. And you're in control of your attention, so you can practice going from one thing to the other. If you interpret tinnitus as not that important, it's just a sound, it's not a good sound or a bad sound, maybe your tinnitus can, you know, it's got some real activity going on in your brain. And if you decide your tinnitus is not important and it's just in the background, maybe your brain will not focus on it so much. If you stay focused, take notes, ask questions, keep yourself engaged in the task you're doing, you can use background sound to decrease the prominence of the tinnitus, and we're gonna talk about wearable devices as well. And you can take control of your attention. So again, we're going to practice in the clinic and give them some homework to think about what the options are in terms of focusing on sound, focusing on visual imagery, and taking control of things so they can switch attention from one thing to the other. And that can include their tinnitus, so it's just, life isn't happening to them, they can control their perspective of things. And they can do that for vision, so we have them focusing on an object out the window or something in the room.

And then focusing on sound, so we have them listening to some background sound, we have some background sounds they listen to in the clinic, but then also have them listen to some of their sounds, their tinnitus. Now listen to the background sound. Now listen to your tinnitus. So you give them some examples of paying attention, that they're in control of these things. It's not just, they're overwhelmed by these things, there's all kinds of stuff going on with all of us. And there's things they can do to make their tinnitus less prominent. So for homework, they're gonna use some background sounds to make the tinnitus less prominent and practice these attention control exercises. For some people, it's visual imagery, for some people, it's a guided relaxation, for some people, it's mindfulness. We're all different, and a lot of these

things can help us change our perspective. Okay, we're gonna finish off here with hearing aids and sound therapy for tinnitus. So, it turns out that, there's a survey we did. These people here all had tinnitus, and 44% of them said they had normal hearing. They did not. They just had tinnitus as the most prominent symptom. Interestingly also, 43% knew they had a hearing loss, but they had not purchased hearing aids yet. So we can help all these people not just with their tinnitus, but also with their hearing by providing hearing aids. Interesting to note that when you get hearing aids, about 4% said it made their tinnitus worse. Which means you need to reduce the gain, at least for a while. But all this group over here, almost 50% say just using the hearing aids actually improved their tinnitus. And that might help because it improves communication, of course, which reduces stress in your life. And hearing aids amplify background sound, which for tinnitus patients can be a real positive thing. So typically, background sound is thought as as being undesirable, but for patients with tinnitus, the background sound can be very helpful. So we will not use things like noise reduction circuits and highly directional microphones, because indeed, we actually want to amplify low level background sounds and not attenuate those low level sounds. So we, of course, use the best fitting possible, hearing is really important.

However, low level sounds are desirable, so we don't wanna attenuate those for the tinnitus patients. So sometimes, open ear molds are good to allow background sounds to come in, not using directional microphones, having higher gains at low levels, not using noise reduction, perhaps having a very wide frequency response. And indeed, these days, of course, you can have a program on your hearing aid for tinnitus reduction, and a program on your hearing aid for maximizing speech understanding and not worrying about tinnitus, and people's tinnitus changes throughout the day, and they're listening environments change the day. So for some of them, they can move back and forth in those different options. If there is a post masking effect for some people, by the way, when they take their hearing aids off, their tinnitus is actually gone. Sometimes it's for minutes, sometimes it's for hours. Interesting observation, though. We would almost always fit two hearing aids, two hearing aids are almost always

better, two hearing ears are almost always better. And sometimes you can even improve the tinnitus in a unilateral case with two hearing aids. If it does make it worse, then try and turn the gain down and gradually turn it up over several months. It may be that some people complain of tactile sensations making their tinnitus worse. That's pretty rare, but we and other people are doing some research on this tactile stimulation to see if that can have an impact on their tinnitus, but a potential issue. Sound therapy is a wonderful thing for lots and lots of patients for their tinnitus. Jack Vernon was instrumental many years ago in persuading a company to get involved in this. Focused on activating with total masking. There are several neurophysiological models, as I've mentioned, the tinnitus is a result of spontaneous activity, but we can reduce the prominence of that spontaneous activity by adding noise. So again, this is the tinnitus, this is the activity on a nerve fiber by low level noise, and when you play both of those things together, then you can mask the tinnitus, make it less prominent. So, lots of different sound therapies available now, indeed, because patients are purchasing those. They differ based on level, sound quality, philosophy, and the mechanisms. These are of relatively minor importance, I would argue at this point.

Some patients prefer actually total masking, they prefer to cover up their tinnitus and to hear the masker instead of their tinnitus. However, most patients prefer partial masking, and that is a lower level sound as is shown here. Here's total masking, where the masker is total carry up. And here's partial masking where the tinnitus is heard, but the loudness and prominence is reduced by the background sound at a lower level. So, we recommend partial masking for most people, particularly if high levels of masking noise can actually make the tinnitus worse or might even make the hearing loss worse. Jastreboff introduced the mixing point, where the masker is just below the tinnitus prominence, and he suggested that as the noise intensity increases, the effectiveness increases for masking until it's just below the tinnitus, and then it goes down and it's not effective when something is totally masked. Well, that's wrong, in my opinion. The mixing point is too loud for most people, the mixing point should not be the goal, and we suggest you use the lowest level that is effective, and there's an article that we

published demonstrating that. So, lots of different options these days. I'm gonna say, one patient listens to a particular sound and they'll say, "Oh, that sounds perfect, "my tinnitus is much less prominent." And then you'll play the same sound to the next patient and they'll say, "No, no, I could never listen to that." So, lots of options. Everybody has to try something and try some different options, maybe over a week or so and pick one that fits for them. Broadband noise is generally easier to listen to. Interestingly, you can present in the contralateral ear, monaural, binaural fittings are possible. And using a low level stimulus in general is the goal. Be careful if sound therapy makes the tinnitus worse. Again, you can use at a very low level, and we're now gonna finish off with hyperacusis. We would use two maskers in general, but you can try this in the clinic first. And then fitting the hearing aid first, making sure the maximum communication is accomplished with the hearing aids. So, wide variety of sound therapies, always combined with counseling, use a low level possible, and the variations among subjects are quite different.

So just one note about hyperacusis. I categorize this as loudness, annoyance, fear, and pain. These are the different symptoms that people experience with the different sounds that are not loud but evoke this terminology. There are lots of other terms floating around, hypersensitivity, select-sound sensitivity, and misophonia, which means a dislike of sound. And I think that this actually adds confusion to the literature for healthcare professionals and patients, we've been using the term hyperacusis for decades, let's stick with that. Don't make up new terms, please. So these are the symptoms that are associated with hyperacusis, and I'll just say that hearing aids can actually help with these patients, using a closed ear mold, reducing the sound as an earplug, but then controlling the level getting to the ear with the amplification system, and you can reduce the maximum output of the hearing aid and then gradually, over several weeks and several months, increase that slowly as the hyperacusis is being treated. The different sound therapy treatments for hyperacusis, continuous bilateral exposure, Jonathon Hazell and Jackie Sheldrake promoted this, wearable devices have been shown to help patients. Jack Vernon suggested that people listen at home

in the evenings for two hours a day under earphones, and then gradually increase that over time. We suggested back in 2000 that people make recordings of the sounds, or we record similar sounds that they're particularly bothered by, and then gradually, over several weeks or several months, increase the exposure to the sound in duration, increase the exposure to the sound in intensity, and gradually work towards the environment that that sound isn't bothersome to them. So, there it is, recording the sounds, playing the sounds under control, and increasing the level and duration. And this is quite helpful for a lot of these patients that are distressed with hyperacusis. Okay, I think we're done now, and it's time for questions.

- [Presenter] Thank you Dr. Tyler. At this time, we'll go ahead and open up the floor for any questions or comments. Feel free to type them in in that Q&A box just below the PowerPoint slides. Dr. Tyler, while we're waiting for members to send those in, I just wanna tell you, thank you so much for sharing your knowledge and your expertise with us. I know that this was a very useful and helpful course, and I'm very certain that it's gonna help many clinicians as they go through their day to day working with patients with tinnitus.

- [Richard] And again, I'm so helpful that now many clinicians are interested in helping these tinnitus patients, and again, we're gonna help them both with their tinnitus and with their hearing, so it's a great thing for everybody.

- [Presenter] We don't have any questions or comments coming through, so I'll go ahead and wrap up today. Thank you Dr. Tyler, we appreciate you again. If you wanted to leave any lasting comments, go ahead at this time.

- [Richard] No, I think we're all set.

- [Presenter] Very good. Have a great day everyone, and thank you for joining us.