

Conversations in Tinnitus with Christopher Spankovich, PhD

January 2021

John Coverstone, AuD
(JC)

Welcome to *Conversations in Tinnitus*, a podcast of the American Tinnitus Association. The American Tinnitus Association is a nonprofit organization dedicated to research, advocacy, education, and support for people who live with tinnitus. *Conversations in Tinnitus* podcasts are an extension of ATA's magazine, *Tinnitus Today*, the only publication dedicated to educating the public and practitioners about ongoing research, treatments, and management of the condition.

Welcome back to another episode of *Conversations in Tinnitus*. I'm John Coverstone, along with Dean Flyger, and joining us for a second episode is Dr. Chris Spankovich, who is an associate professor and vice chair of research in the Department of Otolaryngology, Head and Neck Surgery, at the University of Mississippi Medical Center. And we just finished an episode with Dr. Spankovich where we talked about nutrition and its effects, not just on tinnitus, but on hearing loss and the auditory system and general health even. But one of the things that I started thinking about when listening to that episode was whether we can even separate the benefits that improved or just good nutrition can give us with tinnitus or with hearing and the auditory system from other things which may affect tinnitus, such as benefits we may have for our psychological health, our emotional health, and our physical health in the body.

Chris Spankovich, PhD
(CS)

I mean, you can definitely have some level of an experiment that can separate the physiological from the psychological. And animal models tend to represent that, because we're not really looking at the psychological impact in an animal model anyway with most studies. And that's a big limitation of animal models, particularly with tinnitus. Because we may be able to behaviorally say that that animal has evidence of tinnitus. Of course, there's no objective measure of tinnitus, because we can never really tell the animal has tinnitus. We could simply just go based on the behavioral model that we're using that they couldn't detect that little silent gap in noise, or we train them to hit a button when they hear ringing, and they're constantly hearing the ringing, so they're hitting a button. But we don't really know that the animal actually has tinnitus. And, on top of that, we don't have the elements of the model that's in humans, which is that psychological element in the animal model. We can't tell that the animal's depressed or anxious because they have tinnitus. So, in the animal model we can look at the physiological elements, but we can't look at the psychological elements. In humans, it's so intertwined it becomes very difficult to separate those two things, because obviously tinnitus is not just the physiological source. Tinnitus is a psychophysiological thing, just like most of our percepts have a psychophysiological element. Sound is one of those. Sounds to drive emotion. You hear your favorite song on the radio when you were a teenager and-- you immediately hear that song and it puts you into a happy mood, and you turn the volume up and you're dancing to it. And that's just hearing that sound. That's bringing back a memory and that's engaging a emotional response. That's involving a network of your brain. And that same network of the brain that is normally involved in sound

percept from external sounds is also one that's implicated in tinnitus. It makes sense that your brain doesn't find tinnitus to be a pleasant sound. You don't hear ringing all of a sudden and go, "Oh, this must mean I'm healthier and that I'm going to live longer. This must mean I'm developing super-hearing." No.

You hear ringing in your ears-- your first reaction, "Something's wrong. What's going on?" It's like your car engine. You don't drive your car down the road, and all of a sudden you hear a grinding in the engine, and go, "Oh, this is good. This means I'm going to get more miles per gallon. My car's going to last me another 20 years." No. Your first reaction is an immediate negative interpretation of that sound, "This is something wrong with my car engine. How much is this going to cost me?" That's exactly what someone's brain does with the tinnitus. It assigns it a negative interpretation immediately, because it was not part of their normal experience prior to that. So now their brain didn't really have an understanding of what this signal was, so it has an immediate negative interpretation that it doesn't mean something good. And that's the whole process that we're talking about of the psychological element is getting the brain to recognize that this signal is not conveying any critical information, that it's not important, that the brain can indeed habituate, just like it does to things touching us – just like our brain habituates to other sounds in the external environment. Your brain can accomplish this same thing with the tinnitus. Now if someone is highly stressed, if someone is very unhealthy, they're non-active, they're basically just sitting around not doing very much and don't have very much stimulation, what's their brain going to focus on? It's going to focus on the prominent signal that they perceive, and that's the tinnitus. But if you're eating healthy, if you're being active, if you're getting out and doing things, and if you're feeling good, now we're taking that element of the tinnitus – that emotional element, that attention element; we're manipulating those now. We're modulating those through these changes that can have an impact on reducing the severity and the reaction the individual's having to the tinnitus. So, it's not just that these dietary changes may have some effect on the physiological source of the tinnitus or the hearing loss, rather there's also the emotional and psychological impact of feeling healthy.

And obviously eating has a psychological impact. And there's many individuals that are emotional eaters that when they're stressed or they're anxious, where do they go to? They go to food, right? And that becomes their way of dealing with those issues is to eat. So, the combination of all of these things, and the recognition, also, that does it make a huge difference why it's working? And, yes, the scientist in me says, "Indeed, it does." We want to understand what the physiological effects of these different dietary changes is actually having on the pathway, and what the implications of that are, and also what the dietary effects can be on the psychological underlying mechanisms as well, and understanding how these food changes create changes in neurotransmitters and different things that give pleasure emotions and responses. Sure. We definitely want to know that from a scientific perspective. But understand, eating healthy and exercising, no matter what, is not going to hurt your tinnitus. I'll tell you right now – and you guys, I'm sure, have a similar experience. How often have you had a patient come to your door that is a marathon-running, vegan, yoga fanatic and complaining of tinnitus?

Dean Flyger, AuD

(DF)

CS:

Yeah. Not often at all.

I've seen one, but that was in San Francisco. So, you don't get a lot of marathon-running, vegan, yoga fanatics that are complaining of tinnitus. Even though they

probably have – or even may have tinnitus – it's less of an issue because they have all these other health things that are to their advantage.

JC: Yeah. Absolutely. I mean we've talked about that many times on this program and others that it's largely psychological when you divide people that are affected by tinnitus and people that are not very affected by tinnitus, and without a doubt that's a big part of that difference.

CS: Indeed. Robert Sweetow was one of my mentors. I completed my audiology externship at UCSF with Dr. Sweetow. And he had a quote that he often used, which was that tinnitus is a psychophysiological phenomenon, but often patients will reject the psychological role of it. Many people with tinnitus outright will reject that, "I'm not crazy. It's nothing psychological. If it just wasn't for this sound, I would be fine – that everything would be okay," and that's unfortunately not always true. Sure, the tinnitus can definitely contribute to and exacerbate anxiety- and stress-based issues, and it can cause some of those things. It could be the factor that's doing those things. But ultimately, many patients that tend to have significant issues with their tinnitus tend to have a history of anxiety and depression and other stress issues before the tinnitus ever came along. I mean, it just tends to be the feather on top of everything else on their back that just brings them down and becomes the thing that's very easy to blame everything on, "If it wasn't for this ringing, I'd be able to hear clearly. I wouldn't have these frustrations with my relationships because this ringing would be gone." It's like, "Well, no. That's your hearing loss." Tinnitus doesn't cause hearing loss. Hearing loss causes tinnitus. And, so, getting patients to understand those things I think is helpful for them in the long run to understand that tinnitus does have a psychological component. It doesn't mean that you're crazy. That's not what it means at all. Rather all sound-- all of our percepts have a psychological component to that, and understand that we-- that's one thing we can actually try to change is your reaction to the tinnitus by doing X, Y, and Z. You do these different things, that can help modulate that reaction-- modulate your attention to your tinnitus. By doing that, that can change your relationship to the tinnitus and how much it's impacting your day-to-day function.

JC: Yeah. Absolutely. And diet is part of that, bringing that back around to diet. I mean, that can be an important role in that tinnitus therapy that we do with patients. And I wanted to also bring up something that you kind of mentioned early on, and that was the effect of diet being very in-the-moment, so to speak, or very much a current effect, not necessarily a prolonged effect. If your diet changes, the effects of that will change. Diet is something that we have to have as a lifestyle. It's not something that's going to have a persistent effect if you regress, so to speak, from a healthy diet. I've wondered, have you ever looked at people who have had tinnitus since childhood, because that's an emerging line of research. And I'm sure you're following some of that research from our good friend David Baguley and some of the folks in the U.K. They're kind of leading that research right now in looking at how people's diet changes [as] they age when they've had tinnitus since childhood, and whether you've seen any effects in that population.

CS: Sure. Interestingly enough, I am that population, so I [crosstalk].

JC: Okay. Did not know that.

DF: Oh, you hit home there.

There we go.

CS: So, at the age of 14, I had an idiopathic sudden hearing loss in my right ear. So, I woke up one morning and could not hear in my right ear. I have the classic symptoms of aural fullness, a high-pitch ringing tinnitus. And initially I thought it was earwax or

something. I tried to clear out my ear in the shower. It didn't work. Went downstairs, picked up the phone – and this is of course when we had landlines – and put the phone to my good ear. I could hear the dial tone; put it to my right ear and I could not hear the dial tone. And then the ear started giving the little warning signal, and I could barely hear that in my right ear. We immediately went to the local ENT who thought I was faking and sent me home on an antihistamine. That night the vertigo set in, and we went back the next morning and he knew I was not faking. And at that point I had a profound hearing loss in my right ear. They started me on a blast and taper of steroids, which, also, the evidence of is not great in it really having an impact. Steroids, though, we like to tell patients, "Try to get them within 72 hours, because steroids really have a short window of efficacy." Randomized controlled trials really show that there might not be any benefit of steroids. It's just a thing that we have. And, unfortunately, we don't have many other options, so it's one thing that we can have in our arsenal to try. But no matter what – whether you receive steroids or not – one third of people have full recovery; one third of people have partial recovery; one third of people have no recovery, whether you get steroids or not. I fell in the one third of partial recovery, so I currently have a moderately severe degree of hearing loss cookie bite shape in my right ear. I've had tinnitus ever since then. So, I've had tinnitus for 29 years. I lost my hearing at 14. You can do the math and guess my age.

That being said, through my life and from my own personal experience, I found that, indeed, I do have transient effects of things on my tinnitus, so coffee can be one. If I have a little bit too much caffeine, I can get a transient spike in my tinnitus. And it tends to be more with red wine. I will actually get a little spike in my tinnitus – less with the white or with a nice hoppy beer or something like that. It tends to be that red wine that gives me a little spike. But again, these things are transient in nature. They're not things that are a sustained exacerbation of my tinnitus for the rest of my life. And something that I think is very important for patients to understand is that – for the vast majority of individuals with tinnitus – tinnitus does get better with time without really doing even anything. And the reason why it gets better with time is because your brain does have this natural process of habituation. And I know often physicians will tell a patient, "Don't worry. You'll learn to live with it," which is the worst information that you can give a patient, but, honestly, there's truth to that statement. They just don't take the next step of explaining what habituation is and that this is a process that the brain occurs and give you some tips and recommendations to accelerate that habituation process rather than just leave you hanging. And so that's the main thing to understand is that with time, no matter what your diet is, more than likely you're going to see some improvements in your tinnitus. That being said, eating a poor diet, particularly starting at childhood and moving on, what this is going to increase risk for is probably going to be worsening in your hearing. And if you have worsening in your hearing, well, then, that could potentially exacerbate the tinnitus that you're perceiving, because now we're reducing input into the auditory pathway with natural sound.

There's also work that has shown that children that have had chronic ear infections may be at increased risk and odds of developing tinnitus at a later age. There's a whole lot of things that we don't have good understanding of, because we don't have the longitudinal studies to really follow these populations over time, in terms of how early childhood – how even late childhood in our nutrition and in our lifestyle impact our hearing as we age, and how they impact tinnitus as we age. Ultimately, most kids that have tinnitus are like myself, where I was told as a kid, "The tinnitus is going to be fine." And [you?] sort of buy that as a kid, and you go, "Okay," and it was something that I personally habituated to very easily. I'll tell you what was the more difficult thing for a sudden hearing loss was the aural fullness. That fullness perception when you have a sudden loss like that persists for a good amount of time.

You're talking about nine months to a year that you have sort of this cottony/pluggy feeling in your ear, and then tinnitus with it. And that was the more annoying thing to me was the plugged feeling, which eventually did resolve, even though my hearing didn't get any better. But that sensation resolved with time. But I've had tinnitus for 29 years. I can listen for my tinnitus just like anyone else out there and hear it at any point. I don't do that. Now, I actually notice my tinnitus fleetingly maybe for moments a week, and then I'm able to disengage it very, very quickly. That being said, the worst days for my tinnitus are Thursday afternoons, and I'll tell you why Thursday afternoons. Thursday afternoons I see tinnitus patients. We are talking about tinnitus. It brings my own tinnitus to my attention, which makes my tinnitus go off the chain while I'm sitting there counseling my tinnitus patient. My tinnitus right now is very noticeable because we're talking about the topic of tinnitus.

But I know by the time we finish this podcast and by the time I'm out of work and hop in my truck and I'm back home I won't notice my tinnitus anymore. And it is not like it's just in the background. It is like it is gone. But I can listen for it 24/7, and I can bring it back to the attention of my brain. Those are really the two big things when it comes to tinnitus is understanding that your well-being – your attention is one huge factor in your brain's reaction to your tinnitus. The other thing is sound. And you can take advantage of those two things: of keeping sound and getting your brain to disengage the tinnitus as much as possible by being healthy, by being active. The combination of those two things makes a huge difference in the brain's reaction to tinnitus.

JC: Yeah. I absolutely agree.

DF: Well said.

JC: And I joke with my patients all the time about that – that I'm in absolutely the worst profession for someone who has tinnitus – because we're talking about it constantly on a daily basis, and so it's impossible to get away from it. Right?

CS: But I do this for you because I care so much about you [crosstalk].

JC: That's right. Yeah.

CS: I'm willing to put my own tinnitus to the forefront of my brain for you.

DF: He suffers for his craft, ladies and gentlemen. He suffers, I tell you.

JC: Absolutely. The sacrifices we make as audiologists. Yes.

CS: One thing I do want to bring up – and this is for clinicians and patients as well – there are many different options for tinnitus management. There's not one option out there. Now, there are a lot of studies that have compared different approaches to tinnitus, whether that's simply masking, whether that is using a mixing level of sound therapy, whether that's not sound therapy and counseling alone, whether it's a combination of counseling and sound therapy, whether it's something specific like tinnitus retraining therapy versus just basic counseling. There's a lot of studies that have compared these different things. One thing to understand is that they all can work. When they're compared against each other in a group setting, we don't necessarily see a significant difference between them, but when you compare them to a weightless control population that's got nothing, they all have benefit. That being said, understand that these studies are at a group level. That doesn't mean that one approach may not be more effective for a specific patient. So, when I am working with a patient, I really want to get an understanding of what, specifically, the issues that they are having with the tinnitus so I can tailor my approach for them. So, for some patients there is definitely more of a stress-based element to their tinnitus reaction. In addition, they very much are into, or want to undergo, and are very into

things like relaxation training and really want to talk about the emotional impact of their tinnitus and bringing some elements of cognitive behavioral therapy into the conversation. Not actually performing cognitive behavioral therapy – because I'm an audiologist and I'm not licensed to do that – but bringing in elements of cognitive behavioral therapy to help that patient.

On the other hand, as we were talking about previously, you have patients that outright reject any psychological component to it. So, I'm not going to sit there and get all psychological with them if they don't want to even hear that in the first place. So for that group of individuals I may focus more on talking about the physiological source and sound therapy principles to help diminish the perception of the tinnitus. So there are these different approaches that exists out there: tinnitus retraining therapy; tinnitus activities treatment; integrated tinnitus approach, which Robert Sweetow developed. I believe some of these are compared in this upcoming issue. It's Sherlock.

JC: Oh, okay. LaGuinn.

CS: Yeah. She has a good piece in here that has tinnitus diets, not referring to foods, but referring to sort of counseling types of things – sort of how occupational therapists consider diets. And there's a great comparison of all these different approaches to tinnitus: a generic [inaudible] therapy, tinnitus activity treatment, progressive tinnitus management, integrated approach that Robert helped develop or developed. And so you have all these different approaches. They have a lot of similarities to them obviously. Where they can differ is some of the role of how the person's counseled in a directive way versus an interactive way. How much of the cognitive restructuring element is brought into the conversation, where that's very minimized in tinnitus retraining therapy, where it is heightened, or emphasized in things like tinnitus activities treatment, an integrated model that incorporates more cognitive behavioral therapy principles. So, again, when you compare all these different approaches, on a group level, it's not going to be a huge significant difference. All of them can work. But at the individual level – and this is where as important as us as audiologists and providers to be trained in these different types of approaches – to be familiar with them, because one of these approaches may work a little bit better for one patient versus another. And so being able to take advantage of that and help that patient on their journey by structuring the approach specifically to their needs is, I think, critical, rather just applying one approach to all. Because one approach does not necessarily have an effect on all. So that's the other, I think, important thing when it comes to tinnitus management is really being flexible and being able to make it specific to that patient and that patient's difficulties. And the more expertise we are in these variable approaches, the greater impact we can have on our patient population.

DF: And provide hope – provide a path where something will work – rather than say to that patient, "We haven't had luck with anything. We don't really have a path." Show them the path, and then see what happens, and give them a path to be successful.

CS: Exactly. Yeah. And that's why I think it's also important to have a very holistic approach and bring in elements of diet and lifestyle. In addition to your classic sound therapy and counseling on habituation and source of tinnitus, bring in all of those elements. It doesn't have to be one of those things that has an impact. And ultimately, at the patient level, who cares which one of those things has the impact, as long as it's having an impact. It's really going to be a combination of all those things that's going to help a patient.

JC: Yeah. Absolutely. And taking that whole-person approach that we really should be doing anyway – people are never just a pair of ears, or even a pair of ears and a brain.

- CS: Exactly.
- JC: Absolutely.
- CS: I tell my students all the time, "Your ears are not separate from the rest of your body." I know we love ears, as audiologists, and we're very focused on ears, but there is a head attached to that ear, there is a body attached to that head, and all those things influence that person's hearing health and tinnitus.
- JC: Absolutely. Yep. Absolutely. We've been talking with Dr. Chris Spankovich, who is, again, an associate professor and vice chair of research for the Department of Otolaryngology–Head and Neck Surgery at the University of Mississippi Medical Center. Thank you for joining us for this episode of *Conversations in Tinnitus*, and we wish you the best in future research and look forward to more research in this area as we find out how people can be even healthier and help to deal with their tinnitus through diet and lifestyle.
- CS: Thank you for having me and hope to be with you all again.
- JC: The American Tinnitus Association is a non-profit organization dedicated to research, advocacy, education, and support for people who live with tinnitus. Gifts and donations to ATA are used to support research for a cure and other critical missions described on our website at www.ata.org.